Financing our urban future?

Investigating the implementation and sustainability of developer obligations as a land-based finance method in the Netherlands

Corné Brouwers
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Nijmegen School of Management
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Author & Date

Corné (C.R.J.) Brouwers
S1017231

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Education & Institution

Master Spatial Planning: Planning, Land and Real Estate Development
Nijmegen School of Management
Radboud University

Supervision & Readers

Supervision:	Dr. ir. D.A.A. Samsura
First reader:	Dr. ir. D.A.A. Samsura
Second reader:	Prof. dr. E. van der Krabben

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Preface

Dear reader, hereby I present to you my master thesis about the sustainability of developer obligations as a land-based finance method for sustainable urban development in the Netherlands. This research marks the end of my academic education in the field of spatial planning at Radboud University. Designing, conducting and writing this research has taken a total of six months, and could not have been possible without the help of certain people. This short paragraph is dedicated to those whom have helped me throughout the entire process.

Firstly, I want to thank my supervisor Ary Samsura for his support and guidance throughout the thesis process. Your knowledge, insight and feedback have helped me greatly with designing, conducting and reporting the research. It has been a pleasure to have worked with you over the last six months.

Secondly, I want to thank all of the involved public officers from the municipalities of Maastricht, Eindhoven and Utrecht for their valuable collaboration throughout the interview process. Without their contributions, this research would not have been completed.

Lastly, I would like to thank my girlfriend, friends and family for their continuous support during the highs and lows of the past year.

I hope you enjoy your reading.

Corné Brouwers

Nijmegen, 24th of June, 2022.

Summary

The Netherlands is facing many challenges related to sustainable urban development. Examples are the affordable housing crisis, climate mitigation and adaptation, the energy transition, and development and upkeep of large public infrastructure. Municipalities are at the forefront of tackling these challenges. However, Dutch municipalities are financially in bad shape. Traditional financing methods such as public land banking have been in steady decline since financial crisis in 2008. Instead, municipalities rely on facilitating land policy for urban development, with developer obligations (DO) as a primary cost recovery method. the Netherlands is the last OECD country to implement the DO method in order to shift public costs onto the private sector, potentially signifying a certain lack of experience with the method. Existing research shows that Dutch municipalities are not recovering the same amount of costs as before the crisis, and are having difficulties with financing policy ambitions. Additionally, they do not make use of the DO method to the maximum of its capacity. However, little is known how municipalities use the DO method in practice on a case study basis in the Netherlands. It is not clear to what degree Dutch municipalities are able to develop sustainably in the future using the DO method. Thus, this research answered the following main question and corresponding sub questions:

'To what extent is the current land-based finance method of developer obligations sustainable enough to ensure and promote sustainable urban development for Dutch municipalities in practice?'

1. *How do Dutch municipalities use developer obligations as a land-based finance method in practice?*
2. *To what extent can Dutch municipalities reach their sustainable urban development goals using developer obligations and the existing financial framework?*
3. *What factors influence the usability of developer obligations to promote sustainable urban development in Dutch municipalities?*

This qualitative research focused on three urban municipalities. Maastricht, Eindhoven and Utrecht. Urban municipalities have been selected primarily because existing urban areas will be used to develop more housing, and require more investments in nearby and off-site infrastructure and amenities. The research accounted for geographic spread by selecting three municipalities in different zones of the *Randstad – Intermediate area – Periphery* model. Multiple interviewees (13) of each municipality have been interviewed, spread over 10 separate semi-structured interviews in total. The data has been structured and analysed using ATLAS.TI.

The sub questions are used to answer the main question. The results of the first sub question show that DO use differs greatly between the three municipalities. DO can be used as a cost recovery method for planning costs, on-site costs and off-site costs. The results show that planning costs cannot be completely recovered in Maastricht, due to shortcomings in the national guideline for planning costs (*Plankostenscan*) in Maastricht's context. On-site costs are completely recovered in all municipalities, mostly due to the legal basis and clear relevance of on-site infrastructure. The recovery of off-site costs shows the biggest disparities. Eindhoven has a designated off-site infrastructure fund with a fixed contribution per square meter of additional housing. This ensures that costs are always recovered from developers. Utrecht has no specific fund, and relies on negotiations to come to an agreement on cost recovery. Because this process is laborious, small area developments tend not to contribute to off-site infrastructure developments in Utrecht. Maastricht does not use DO for additional off-site infrastructure funding at all. The method is not suitable for their ambitions, as the housing developments in Maastricht have too little margin to significantly

contribute to off-site infrastructure investments. Furthermore, the results show that all three municipalities strive for optimal instead of maximum cost recovery. This is because a balance between financial contributions and the realisation of policy ambitions has to be found. The municipalities prefer the realisation of policy goals over additional financial contributions for off-site infrastructure, which explains why municipalities do not maximise DO.

The second sub question focused on municipal sustainable urban development. The results show that DO is insufficient on its own to significantly promote sustainable urban development. This is because new developments make up a small percentage of the built area, the existing city also benefits from additional off-site infrastructure. Thus, a developer cannot be expected to fully pay for additional off-site infrastructure on their own. Instead, DO is used as a financial supplement for off-site infrastructure, but it is a significant contribution in Utrecht and Eindhoven. The remaining land-based financing (LBF) methods are also insufficient for sustainable urban development on their own, these include: public land banking, real estate tax and land leasing. Thus, alternative sources of financing have to be found. Municipalities do not have the financial capacity to pay out of pocket for sustainable urban development, and the national government is expected to contribute through subsidies. In practice subsidies have strict criteria, which especially impact municipalities with less urban growth such as Maastricht. In all three municipalities subsidies are structurally needed in order to fulfil municipal ambitions surrounding sustainable development.

The third sub question focused on influential factors on the relationship between DO use and sustainable urban development. The research used *Negotiation Theory* and *Policy Change and Implementation Theory* in the theoretical framework in order to explain the relationship from theory. In the empirical research, this relationship has been found and confirmed. The bargaining process for DO influences sustainable urban development negatively through a lack of trust fuelled by information asymmetry. Also, a lack of transparency, lack of municipal capacity and power differences negatively affect negotiation outcome and potential cost recovery for sustainable urban development. The policy process determines the certainty of DO contributions. 'Hard' policy for off-site costs, such as Eindhoven's fund, is more reliable than 'soft' policy which is reliant on negotiations. A newly found factor is 'market structure', an umbrella term for developments regarding the economy, demographics and the developer's business case. A municipalities' market structure determines how much margin is left in a potential development, and if DO is applicable. A smaller margin means less room for DO and further policy realisation. Currently, economic developments such as the high inflation, labour shortage, supply chain issues, and high energy prices are expected to hurt the margins and hamper the use of DO for sustainable urban development. Additionally, all three municipalities showed a correlation between economic trends, urban growth and the need for DO for additional off-site infrastructure, signifying that the method is sustainable as long as there is significant urban growth in a municipality. This is because potential DO is dependent on the amount and type of houses that are developed.

Based on the sub questions, the brief conclusion is that DO is insufficient for sustainable urban development on its own, but can be considered a sustainable method when it comes to being a supplementary finance method, although this is dependent on the market structure per municipality. Even though the aforementioned economic developments are expected to hurt DO use for sustainable urban development in the short term, the interviewees expect this effect to nullify in the long term – due to DO's correlation with urban and economic growth, and the need for additional infrastructure. Thus, the DO method is regarded as sustainable for municipalities that are experiencing urban growth. However, complete sustainable urban development can only be ensured when factoring in financial contributions from the national government.

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1. Introduction

This chapter serves as the introduction to the research. Firstly, a contextual background will be given about the research. Secondly, a problem statement will be given which provides an indication how the research problem stems from literature. After this, the problem statement is deduced into a research objective and corresponding research questions. The relevance of the research in the scientific context and the societal context will also be discussed.

1.1 Contextual background

Dutch municipalities are financially in bad shape. 79 Percent of all Dutch municipalities expected a loss in the closing year of 2021 (Jongsma et al., 2021). A downward trend is visible when it comes to Dutch municipal finance. In 2018 the collective balance of all Dutch municipalities was negative at 130 million euros. In 2019 this number sunk to 747 million euros. Over 2021 the expected collective loss is over 1.3 billion euros (Jongsma et al., 2021). The bad shape of municipal financial health has negative effects on different policy areas, especially since the decentralisation of many governmental tasks. Housing (RIGO, 2017), climate adaptation (Leeuwis, 2020), the energy transition (De Vries et al., 2019), social (health) care and societal support (CBS, 2020) all have to be carried out on a municipal scale level.

To make matters worse, the challenges in this day and age are ever-growing regarding the aforementioned policy areas. the Netherlands has major issues surrounding the housing shortage, the climate crisis, the energy transition and currently, COVID-19. As a reaction towards the financial struggles, municipalities have been starting to implement budget cuts, especially when it comes to the availability of public services and the upkeep of green, blue and urban spaces within the municipality (Jongsma et al., 2021). This is perpendicular compared to the initial function and goal of the municipalities, and a highly unwanted situation for both government officials as well as the citizens of a municipality.

A part of the financial problem are the losses of area development gains since the financial crisis (Jongsma et al., 2021). Municipal land ownership has steadily declined, and the profits on existing land have been lower than before. Land ownership by municipalities was widely used in order to fill budgetary holes in the cost recovery of development projects back in the day (Buitelaar, 2015). The decrease of this strategy also leads to a weaker position in negotiations with other parties regarding urban development, especially if the municipal budget is already on the smaller side. For example, a stronger position of the municipality during negotiations, and the ownership of land leads to the construction of more affordable housing (Deloitte Netherlands, 2021). The lack of land ownership and access to a plentiful budget might have substantial effects on the carrying out of policy regarding urban development in Dutch municipalities.

Thus, the situation surrounding municipal budgetary problems seems to stem from multiple sources. The general trends in society have led to an increase of pressure on a municipal level regarding the housing crisis, the climate crisis, healthcare and demographic changes. Meanwhile the state has decentralised tasks which have a negative impact on the financial health of the municipality and the functioning of public officers when it comes to making and implementing policy. Finally, the market and privately owned companies have acquired land positions which influence the progress and development of urban systems within municipalities and make it increasingly harder to achieve certain policy goals. However, it is not certain in which manner this is happening across municipalities and what the effects are on sustainable urban development for the Netherlands.

1.2 Problem statement

the Netherlands is facing a big challenge regarding urban development in the coming years. According to the Dutch government, close to one million homes have to be built in order to facilitate the growing demand for housing in the Netherlands, the majority of the newly built homes are to be planned in existing urban areas (Rijksoverheid, 2021). The development and re-structuring of urban spaces and neighbourhoods to accommodate this growth demands for more contributions to the public space than merely housing. (Large) Public infrastructure such as roads, parks, green areas, social facilities, amenities, landscaping and sustainability measures have to be implemented as well by the municipalities (Muñoz Gielen & Lenferink, 2018). Thus, local governments in the Netherlands are under a lot of pressure when it comes to urban development (Hendricks et al., 2021), all while municipalities have dwindling financial means to live up to their public tasks. Due to the effects of the financial crisis and the decentralisation of administrative tasks from the national to the local level, financial shortcomings and structural budget issues are looming on the horizon for Dutch municipalities (Jongsma et al., 2021).

However, this problem is not strictly a Dutch one, and has been a critical discussion point within the scientific debate surrounding urban planning and municipal finance. Since the financial crisis, the local public sector across Europe lacks the resources which are necessary to modernize and facilitate urban development in the traditional way (Camagni, 2016). The local public sector's financial problems can prove to be a severe issue when it comes to upholding a high degree of sustainable urban development. According to Schlachter et al. (2011) the role of local governments and municipalities is crucial in tackling national issues on a local scale such as environmental crises and risks, growing infrastructure demands and promoting the local economy. Traditional ways of funding urban developments might turn out to be insufficient for tackling nation-wide problems on a municipal scale. Traditional forms of funding can be in the form of active land policy, which has been the prevalent method of financing urban development in e.g. the Netherlands (Buitelaar, 2015) (Hendricks et al., 2021). In the Netherlands this method of financing has been declining in general, which is why the demand for improvements to the financial system for municipalities has been growing rapidly in order to make up for the losses on active land positions (Muñoz Gielen & Lenferink, 2018). There have been attempts made by the national government to give the Dutch municipalities more resources from which to draw funds from, not just in the form of active land policy and national subsidies, but also in the form of developer obligations to fund urban developments in Dutch municipalities (Muñoz Gielen & Lenferink, 2018). However, earlier research has shown that Dutch municipalities do not always make adequate use of the opportunities in the current framework, and that municipalities actually capture less value to fund urban development than is currently possible in the Dutch land-based finance framework, even with the use of developer obligations by municipalities (Stec Groep, 2021). It is therefore not clear why or how Dutch municipalities are not able to fund their urban development projects using this method in practice.

Since municipalities in the Netherlands are facing immense challenges regarding sustainable urban development such as providing high quality affordable housing, climate adaptation, green and blue spaces and infrastructure in general, it is of great importance that municipalities are able to fund these projects, even in these times of financial hardship. Taking this into consideration, the question can be asked to what extent the use of developer obligations in the current land-based finance framework actually can be considered sustainable, and if this can promote sustainable urban development in Dutch municipalities.

1.3 Research objective and questions

1.3.1 Research objective and aims

The goal of this research is to provide a deeper understanding of the workings of Dutch municipalities when it comes to using developer obligations in order to promote sustainable urban development. In order to gauge how applicable developer obligations are for sustainable urban development in the short and long term, its sustainability will be researched. Therefore, the practical application, use and sufficiency of the method have to be investigated.

Due to the nature of the subject, this research has multiple aims. Public administration researcher Van Thiel (2014) has compromised several general research aims. The first aim of this research is to investigate the workings of the Dutch land-based finance framework in an exploratory way; how does the framework function in the Netherlands, especially when it comes to developer obligations? Next to that, researching the practical use of the developer obligations method, as well as the land-based finance framework by Dutch municipalities can also be seen as exploratory research, as little is known how municipalities do this on a case-study basis. Conducting research in this manner paves the way to conducting explanatory research down the line; is the use of developer obligations, next to additional financial methods, sufficient for sustainable urban development and what factors contribute to this? According to Van Thiel (2014) evaluative research gauges whether certain policy, or in this case, a method or framework, can contribute to realise certain targets. Based on that, a natural consequence of evaluative research is that recommendations for praxis will be formed for improvements to the tested policy and/or framework. Thus, the research aims discussed in this paragraph are suited to relate to the research goal.

1.3.2 Research questions

The problem statement and the research aim will be compressed into research questions, consisting of a main research question along with three sub questions. The answers to the sub questions will be used to answer the main question.

As stated beforehand, this research will focus on creating a deeper understanding of the Dutch use of developer obligations as a land-based finance tool, and in what manner municipalities are able to use this tool available to them in order to promote sustainable urban development in a sustainable way. The main research question therefore can be composed as follows.

‘To what extent is the current land-based finance method of developer obligations sustainable enough to ensure and promote sustainable urban development for Dutch municipalities in practice?’

In order to find an answer to the main research question, the following sub questions have been created:

1. How do Dutch municipalities use developer obligations as a land-based finance method in practice?

This sub question is focused on the use developer obligations as a land-based financing method when it comes to Dutch municipalities in practice. With the use of semi-structured interviews with involved public officers, it will be explored how and why certain developer obligations are used within the respective municipalities. This sub question will thus illustrate why certain developer obligations are used, and what motivations, considerations and decisions have led to this in a specific case study context. Next to this, advantages, disadvantages and potential issues regarding the use and implementation of developer obligations will be analysed respectively. This will paint a picture of the initial use of developer obligations for land-based finance in the Netherlands, expressed by several municipalities in the form of case studies.

2. To what extent can Dutch municipalities reach their sustainable urban development goals using developer obligations and the existing financial framework?

This sub question aims to analyse if the use of developer obligations within the current framework for land-based finance is sufficient enough in order for Dutch municipalities to reach their sustainable development goals. This sub question will also find its origin within the semi-structured interviews. Questions will be asked to involved public officers in order to find out if the goals which the municipality has regarding e.g., housing, climate adaptation, service allocation, green spaces, blue spaces, and urban regeneration can be reached using the current finance methods which they have to their disposal, with a focus on developer obligations.

3. What factors influence the usability of developer obligations to promote sustainable urban development in Dutch municipalities?

Lastly, this sub question uses the semi-structured interviews to locate influential factors on the relationship between developer obligations and sustainable urban development, and how these factors influence sustainable urban development. When these factors have been located, recommendations for praxis can be given on how to improve the promotion of sustainable urban development using developer obligations. Therefore, this sub question analyses the relationship between the two variables, as well as provide an insight in possible new factors that can influence their relationship.

Together, these three sub questions will contain enough data in order to answer the aforementioned main research question.

1.4 Relevance

1.4.1 Scientific relevance

Relevance can also be applied to the scientific side of the research; in this case it means the significance of a potential contribution to existing knowledge within a scientific field or problem (Van Thiel, 2014). This research will contribute to the knowledge gap about the use and sustainability of developer obligations and its effects on sustainable urban development for Dutch municipalities in practice.

Earlier research does not apply the use, application and success of developer obligations as a land-based finance method on a thorough case study basis in the Netherlands. Previous research tends to focus on the introduction of new methods of land-based finance or value capturing methods in the Netherlands, from a perspective of improvement based on success stories from abroad. Methods such as Transit Oriented Development (Thomas et al., 2018), Tax Increment Financing (Root, 2016) and Transferable Development Rights (Janssen-Jansen, 2008) have been discussed in this fashion. Research does point out the decline of traditional finance methods for Dutch municipalities (Alterman, 2011) (Hendricks et al., 2021). According to Alterman (2011), the Netherlands is the last OECD (Organisation for Economic Co-operation and Development) country to shift investment costs in the public spatial domain from traditional public sources onto the private sector, while other countries have decades of experience. This funding change in the Netherlands is thus quite recent compared to other countries.

Research has been carried out to investigate the workings of new public funding methods in the Netherlands, especially when it comes to developer obligations (Muñoz Gielen & Lenferink, 2018) (Muñoz Gielen & van der Krabben, 2019) (Hendricks et al., 2021). The research by Muñoz Gielen & Lenferink (2018) indicated that the developer obligation method does not compensate for lost profits on traditional financial methods. This can indicate a problem between the costs of investments versus the profits of using developer obligations to fund urban developments. Next to that, the research indicated that municipalities with policy regarding developer obligations were more likely to negotiate large public infrastructure contributions. Opposing this, the research by Hendricks et al. (2021) stated that policy related to developer obligations can create issues regarding predictability, detail and comprehensibility, especially if the policy is not written and implemented well. In addition to this, Muñoz Gielen & van der Krabben (2019) stated that there are many unclear aspects surrounding the use and content of local policy and developer obligations, and that it is not clear how far municipalities should negotiate for developer contributions.

However, a recent study by Stec Groep (2021) came to the conclusion that the developer obligation method is not always effective enough when it comes to housing realisation and urban development in the Netherlands. According to the study, Dutch municipalities do not capture all of the available value when using developer obligations. Uncertainties about the use of developer obligations within current land-based finance framework, the implementation of it, and the effectiveness of it still exist in this research when it comes to sustainable urban development (Stec Groep, 2021). Previous research into developer obligations in the Netherlands tends to focus on a larger scale using quantitative methods. This research will be qualitative, which provides a chance to test larger scale, broader theories on a case-study basis (Vennix, 2016). This research will provide thorough contributions to the debate on the effectiveness and the sustainability of the current land-based finance method of developer obligations for urban development in the Netherlands. It aims to contribute to the current knowledge gap about the use and sustainability of developer obligations in practice, and the reasons why this method has its flaws and advantages on a case-study basis. The

results of this research will be useful because the practical case-study experiences of municipalities will be able to provide a deeper understanding about developer obligations and the use thereof in Dutch municipalities for sustainable urban development in the future.

1.4.2 Societal relevance

According to Maassen et al. (2010) societal relevance is defined by the manner in which research contributes to and creates a deeper understanding of society and its practices, along with goals they intend to achieve and should potentially contribute to the resolving of problems or issues. Following this definition, the connection can be made with this research and its societal relevance.

This research focuses on the capacity which municipalities have in order to implement urban development in a sustainable way using developer obligations within the financial system. This is directly connected with widespread societal issues which impact urban development which Dutch municipalities deal with such as the (affordable) housing shortage on a local scale (RIGO, 2017) (CBS, 2022c), climate adaptation and mitigation (Leeuwis, 2020), the energy transition (De Vries et al., 2019), the creation and upkeep of (social) services and the implementation of public infrastructure (Muñoz Gielen & Lenferink, 2018). The aforementioned issues have a direct impact on the quality of life in municipalities, and if they are lacking will have negative impacts on the quality of life within the respective municipalities (Serag El Din et al., 2013). In order to make sure that the quality of life within Dutch urban areas does not decline along with the challenges which municipalities face, it is of importance that these elements can be financed in a way which do not limit other elements of the municipality, both in the present and the future. In other words: "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*" (the Brundtland Commission in Serag El Din et al., 2013). In this context it is societally relevant to make sure that the current financing methods are adequate enough to ensure sustainable urban development in order to maintain a high quality of life within Dutch municipalities.

Thus, there is a clear connection between societal problems and this research. Next to that, this research will potentially contribute to the solving of aforementioned problems on a municipal scale by providing practical recommendations for land-based finance in the Netherlands when it comes to the use of developer obligations, general use of methods and the capability to reach municipal goals with land-based finance methods.

2. Literature review and theoretical framework

Chapter two of this research focuses on literature, concepts and theories which are relevant for conducting the research in a well-founded manner. Firstly, a literature review will be carried out. According to Merriam and Simpson (2000) in Rocco & Plathotnik (2009), a literature review serves as a crucial step to lay the foundation for a conceptual framework. Firstly, the literature review will discuss concepts which are related to the virtuous value cycle and its relationship with land value changes. After that, common methods of land-based finance will be discussed. Their differences in structure and application will be highlighted as well. This will provide a strong foundation for the conceptual framework.

Secondly, this chapter will explore theoretical concepts in the theoretical framework. The theoretical framework looks into existing theories, concepts and research in order to lay the foundation for theory testing, contribution and potential development of new theoretical knowledge (Rocco & Plathotnik, 2009). In order to assess which literature and concepts are relevant, the five functions of a literature review by Merriam and Simpson (2000) in Rocco & Plathotnik (2009) are used. These can be deduced into (1) building a foundation, (2) show the advancement of knowledge, (3) provide concepts for the research, (4) assess the design and instrumentation for the research and (5) indicate a reference point for the findings. It is not necessary for a concept or theory to live up to all of the aforementioned functions, but the literature review and theoretical framework as a whole tend to achieve most functions in an overarching way.

The two theories which are highlighted are Negotiation Theory and Policy Change and Implementation Theory. Negotiation Theory explains the role of negotiations within a process, and how a negotiation can be carried out successfully. Since the use of developer obligations is dependent on negotiations between the municipality and a developer, a theoretical view on negotiations is of added value to the research. Next to that, Policy Change and Implementation Theory looks at the change from active land policy to facilitating land policy and the use of new land-based finance methods, such as developer obligations. The Policy Change and Implementation Theory will also provide structure when analysing municipal policy about land, development, finance, cost recovery and sustainable development. The two theories will be used to help answer the research questions from a theoretical perspective.

Based on the literature review and the theoretical framework a conceptual framework will be presented at the end of this chapter.

2.1 Literature review

2.1.1 The virtuous value cycle

The virtuous value cycle is a concept that can be described as a positive feedback loop regarding investments in public infrastructure (Lord et al., 2019). In this case, infrastructure has a broader definition than just the implementation of transport services such as roads. According to Muñoz Gielen & Lenferink (2018) 'infrastructure' in this case can also mean the implementation of green spaces, parks, social amenities, climate change adaptation measures and social housing. According to the virtuous value cycle model, improvements made regarding the aforementioned infrastructure will have positive impacts on the quality of life and/or economic growth in an area. In turn, land values will rise due to these public investments. The value will then be captured and distributed in such a way that improvements in infrastructure can be made again, which will lead to yet another loop within the virtuous value cycle. In theory, the positive feedback mechanism within the cycle will lead to improvements for the community, as well as financial gains for the responsible local government.

But the positivity within the feedback loop also works the other way around. Inadequate investments in infrastructure can lead to the degrading or pauperisation of infrastructure (Lord et al., 2019). This can be the case for developing countries, regions or neighbourhoods within a city. This will lead to a lower quality of life due to the relatively bad quality of available infrastructure, which also hampers economic growth. As a consequence, the land value will stagnate or even decline, which leads to lower amounts of potential value to be captured by local governments. In turn, the investments in the improvement of infrastructure from captured value will be lower, which enhances the feedback loop once more. Both the virtuous as the vicious cycle are displayed in figure 1.

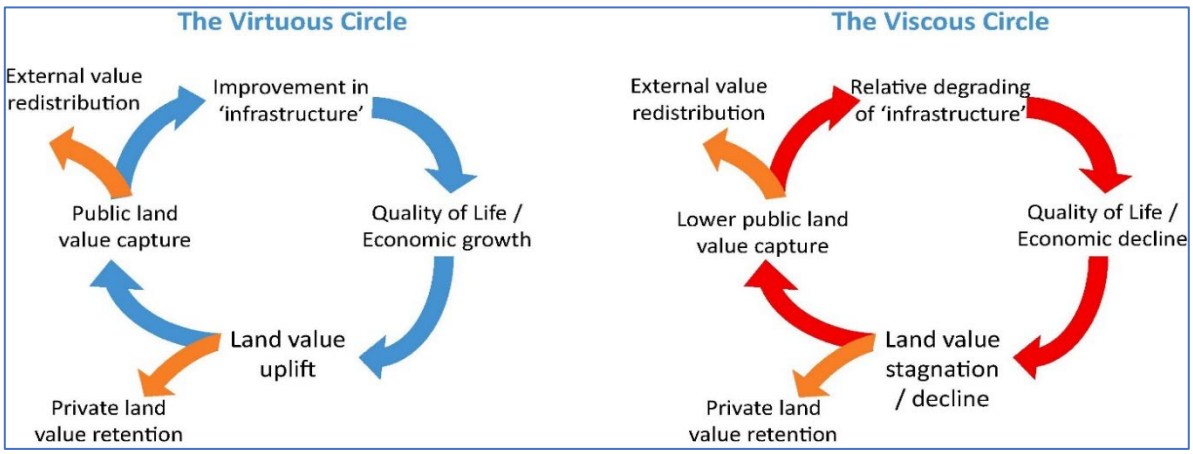

Figure 1: The Virtuous and Vicious Cycle displayed (Lord et al., 2019).

2.1.2 Changes in land and property values

Value capturing heavily depends on the change in value of certain land or property. It is therefore crucial to analyse which factors determine or contribute to land value change. The upcoming paragraphs will delve deeper into this concept. This will create a better understanding of the steps within the virtuous value cycle as well as the starting-point for land-based financing, which will be discussed in paragraph 2.1.3. In addition, understanding when land and/or property values change is of importance for many stakeholders within the land and property market. For landowners a value change can mean the increase or decrease of their asset value. For private owners of land and property this is translates to losses or gains in wealth (Ciurila et al., 2021). For public actors changes in land value can mean more or less potential for value capture as well (Walters, 2016).

Public investments in an area

The first determinant in land and property value change are investments in the nearby area that correlate with quality of life (Serag El Din et al., 2013). Public funded facilities such as schools greatly contribute to housing values in the neighbourhood. Both the initial availability and the quality of the school matters when looking at property value increases (Li et al., 2017). Further existing literature confirm this statement. According to Chin & Foong (2006) the valuation of property is correlated with the accessibility to high quality schooling. This correlation remains true even if the prestigiousness of the neighbourhood and the level of property ownership are taken into account. Investments in high quality education have a positive effect on residential property values, which go hand in hand with land value changes (Chin & Foong, 2006).

Song & Knaap (2004) have found a connection between mixed land use and residential property value. Mixed land use is a term used for variation within spaces of land. This means that space for green, retail, residential, services and business are combined instead of separated in different areas, which has the benefit that the available space is used more efficiently and that commute times, pollution and congestion levels drop. Especially green and commercial spaces heavily influence residential property prices. Property located in the vicinity of a public park will increase in price significantly. The existence of small retail businesses also will positively influence property values. However, the presence of apartment buildings tends to have a negative effect on nearby property values.

Earlier research also indicates that transportation options and nearby infrastructure greatly influence the land and property value. When a major transportation hub like a railway station is constructed, the land value in the surrounding area will increase (Bowes & Ihlanfeldt, 2001). However, the increase on land and property value is dependent on the type of infrastructure hub. A railway station which is only meant for cargo will have a negligible effect on land values, while a railway which improves commuter time towards the city centre or the central business district will significantly add more towards land value prices (Bowes & Ihlanfeldt, 2001). Next to that, infrastructure used for transportation such as roads, highways and public transport also contribute to higher land and real estate values. Research by Haider & Miller (2000) has shown that potential residents have a higher demand, and are thus willing to pay more, for land and property which is nearby infrastructure which connects them to the city centre or a business hub via subway, highway or public transport. In addition to the ‘traditional’ infrastructure concepts, public charging stations for electric cars also have a positive impact on the land and real estate values (Sheng et al., 2021). The implementation of aforementioned infrastructure will add to the land and property values, which creates room for potential land value capture.

On another note, recent research has shown that the implementation of climate adaptation measures by cities along flood prone and natural disaster-prone areas see land and property values in nearby areas rise. Especially the effects of elevation measures and the provision of green infrastructure contribute to this change (Kim, 2020). In addition to this, property which is protected by levees and property which is protected by a permanent seawall have price appreciations ranging from 8 to 10 percent (Kim, 2020). Many necessary investments in climate adaptation will have a positive influence on land and property values in the future. Related to this are environmental factors. It is important to mention that certain environmental factors are physical, such as lakes, mountains and forests. These can hardly be 'constructed' by governments, but can be protected and maintained to retain their quality. High quality surface waters such as ponds, lakes and riversides impact land and property value positively and can be adapted by local governments (Cellmer et al., 2012). An environmental factor which is perhaps more controllable is air quality. According to Azmi et al. (2012) the relationship between air quality and a rise in property value is significant. However, it must be mentioned that this relationship gets stronger when air quality is perceived as being poor by inhabitants. Neighbourhoods with moderate and good air quality report less significant results. In addition to this, Chakraborti et al. (2019) found that average citizens in the metropolis of Mexico City are willing to pay high premiums to live in areas with significantly better air quality. Residential areas within an area with good air quality, or relatively good air quality compared to other parts of a city will see a significant rise in property value.

To conclude this paragraph, (public) investments in measures which increase the quality of life have the tendency to cause a rise in land and property values. Since the relations of the aforementioned factors tend to be positive relationships, the opposite is also true. Lower or no investments in an area can cause a decline in the quality-of-life overtime, which stagnates or lowers land and property values compared to other areas. With this knowledge a better understanding is created about the relationship between investments in the quality of life and land and property value change within the virtuous value cycle.

General economic trends

However, not all changes in land and property value change can be attributed to the investments done by (local) governments in an area. (Macro) economic developments also have an effect on the land and property values. Since the land and property markets are connected and embedded within the financial system and can also be classified as consumer goods, their local value can partially be explained using supply and demand (Renes et al., 2006). Land is heavily embedded within the financial system because of its unique characteristics. Land as we know it only has a limited supply on earth, and property needs to be built on the finite supply of land. Human activities and necessities require land, which gives it its inherent value (Buitelaar, 2021). This connects land with capital markets, since it can be seen as an investment as well as collateral. It has to be mentioned that land markets and property markets differ, but value changes tend to correlate (Buitelaar, 2021).

The supply of physical land is fixed, but demand can fluctuate significantly. According to Van Dam & Eskinasi (2013) the demand for land and property can be split between the *size* and the *nature* of the demand. The size of the demand is partially determined by the actual population size in a certain region or municipality. A more populous municipality will demand more land in order to sustain itself for housing, amenities and services. This leads to a higher demand and a positive value change for land and property (Van Dam & Eskinasi, 2013). The influx of new inhabitants in an area can, next to natural birth rates, be induced due to opportunities and pull-factors within the economic, social or academic realm.

The size and the nature of the demand also correlate with the willingness to invest and the investment capacity of potential buyers of land and property (Van Dam & Eskinasi, 2013). These factors are correlated with economic trends and interest rates. The state of the economy can be divided into two different stages, periods of economic growth and periods of economic decline. According to Haffner & Van Dam (2011) a correlation can be seen between the state of the economy and the land and property values due to changes in demand. The state of the economy influences important factors such as income, willingness to invest and willingness to relocate. These three factors, when in decline, ensure for a lower demand to land and property investments which causes values to drop. The opposite is also true, in a period of economic growth the incomes, willingness to invest and willingness to relocate grow as well (Haffner & Van Dam, 2011). This causes an uplift in value when it comes to land and property.

Interest rates also influence the demand for land and property. Van der Horst (2019) states that there is a negative relationship between interest rates and consumer demand. When interest rates are low loans can be received for a relatively low price, which makes investing easier and increased the demand, and also the price for certain goods such as property and land. Low interest rates are therefore also an attribute of a period of significant economic growth (Haffner & Van Dam, 2011). High interest rates tend to do the opposite. Loans are more expensive which limits the investment capacity and puts a halt to the higher demand. In turn, the price decreases for land and property. In addition to this, the height of interest rates affects the willingness to save capital instead of spending or investing it. Low interest rates yield low savings on bank accounts, and investing into the land and real estate sector is a way which can make up for the lower returns on savings accounts. Van der Horst (2019) concludes that the sheer amount of money saved by people also has an effect on the interest rate, and that the (current) low interest rates therefore also influence the rise in land and property value on a global scale.

This paragraph has discussed ways in which larger economic trends also influence land and property values. Knowing the difference between value changes caused by public investments in an area and the general economic trend is of importance since the responsible local government can use this as an argument to potentially capture additional value next to public investments.

Actions by (local) governments

Next to public investments, (local) governments can also influence land values by different instruments. The following paragraph will briefly discuss how the existing literature can connect governmental instruments and measures to land value change.

According to classical economist Ricardo (1817), land is only a factor of production that derives value from what can be produced on it. Land becomes more expensive when there is more demand for a product or service which it can facilitate, such as housing. Land will be used to meet the demand and thus land values will rise (Ricardo, 1817). This point of view is important to grasp since it provides a connection between the finite supply of land (Buitelaar, 2021) and growing consumer demand for activities based on land. But not only is the physical supply of land limited on earth, the supply is also limited by policy and zoning. Limits on the supply create artificial lack of supply which can increase land prices. Spatial planning policy is a big determining factor when it comes to analyzing the price difference between certain plots of land. This is because local governments have a major influence on the amount of land which is available for a certain use. In the literature, this phenomenon is called a regulatory tax (Glaeser et al., 2005), an increase in price which can be linked to the spatial planning policy when looking at land and property. Without spatial planning policy, more land would be available for certain uses since there would not be restrictions, more supply of land would cause prices to go down.

Furthermore, the type of ‘use’ determines the value for a parcel of land for a big part (Buitelaar, 2021). Terminology differs, but in English a land use plan or a zoning plan is used for the administrative plan which is used to determine the type of application for a certain area of land. In line with Ricardo’s (1817) thinking regarding land value, the type of land use which is most in-demand will reap the largest profits. Oxley (2004) in Buitelaar (2021) argues that a zoning change in favor of the landowner is likely to happen when there is a financial surplus. The surplus is the potential difference between the current and the future land value with a new type of land use. In the case of farmland and residential land, this surplus will be positive due to the large demand for activities on this land, such as housing (Buitelaar, 2021). The zoning instrument is therefore a big factor when looking at land value change which can be induced only by government actors.

This paragraph has explained three main factors of influence on land and property value. The following paragraph will further explain land-based financing, and how land-based finance methods make use of changes in land value for further investments in the public area.

2.1.3 Land-based financing

Land-based financing is an umbrella term for certain financial tools which use land values or increment land values to further finance urban developments. As land is bound by location, making use of this asset tends to happen on a local scale, such as in a municipality (Sait, 2019). One of the motivations behind the use of land-based financing tools is the notion that urban land can be seen as an economic production factor within towns and cities (Sait, 2020). According to Peterson (2009), land-based financing methods are most appropriate when applying them in areas that are subject to rapid urban growth. Important factors that play a role in rapidly urbanising areas are rising land prices and a high need for new infrastructure investments to cope with the growing population and the use of existing urban infrastructure. Therefore Peterson (2009) distinguishes three main categories of urban developments that benefit from land-based financing methods. (1) New developments: large plots of greenfield areas that are converted into urban areas. Especially the infrastructure that is necessary to connect the new urban area to the existing city is costly. (2) Major infrastructure investments: similar to the previous category, but the difference is that infrastructure within urban areas must also be upgraded due to a higher demand, or a new innovation such as carbon-neutral public infrastructure. The last category is (3) basic urban services such as sewers, water supply and street paving. Land-based finance methods are thus primarily attractive when developing during times of urban growth. Peterson (2009) distinguishes a few investment methods which make use of increment land and property value. However, analysis of different literature shows that Peterson's view on land-based finance methods excludes some other instruments (Bahl, Linn & Wetzel, 2013) (Sait, 2019) (Walters et al., 2016) (Walters et al., 2020). Combining multiple sources, a short overview of the most common land-based finance methods is displayed below in table 1.

Land-based finance method	Description
Betterment levies / Land value increment taxes	Taxes on increment land value due to public investments in surrounding area and infrastructure.
Public-private partnership	Mutual agreement between the public and private sector where the private sector supplies public infrastructure in exchange for land.
Impact fees	General fee to accommodate urban growth. Paid by parties who benefit from urban expansion.
Land asset management	Managing public land assets in order to finance infrastructure projects. The selling or leasing of land, but also strategic acquisition around key public infrastructure projects.
Developer obligations	Costs paid by developers in order to compensate for urban expansion in the on-site and off-site area around the development. Differs from impact fees as the impact fee is general, whereas the developer obligations are area-specific.
Recurring taxes on land and property	Flat rate taxes on land and property generates income which can be used in order to further maintain, develop or improve urban areas and their connecting infrastructure.
Sale of development rights	Separation between land ownership and development rights. Municipalities or public bodies can use this method to generate an income by auctioning development rights, which in turn can generate revenue for the city.

Table 1: Overview of most common land-based finance methods. (Bahl, Linn & Wetzel, 2013) (Peterson, 2009) (Sait, 2019) (Walters et al., 2016) (Walters et al., 2020).

Table 1 merely provides an overview of the most common land-based finance methods. However, the implementation and regulation differ per individual country, region or state. Municipalities are bound by national legislation as to which land-based finance methods they can utilise. This study focuses on the Netherlands, but critical information surrounding land-based finance methods should also be presented in general, which table 1 provides. Chapter 4 will further elaborate on the relevant land-based finance methods that are commonly used in Dutch municipalities.

2.2 Theoretical framework

This paragraph will explore broader theories regarding this research. According to Collins & Stockton (2018) there are three main applications for theories within qualitative research. These are respectively: (1) framing of the research within a paradigm, (2) using different theories to guide the research to a certain extent and (3) the creation of theory or adding onto theory as a result of data collection. Step 1 and 2 will be carried out within this paragraph. Because step 3 is a result of data collection this step can only be carried out after collection and analysis has been completed. Firstly, this paragraph will explore how this research relates to epistemology, and in what paradigm it can be placed. After this, two relevant theories will be discussed, Negotiation Theory and Policy Change and Implementation Theory respectively.

2.2.1 Epistemological paradigm

Epistemology can be described as 'the theory behind research' and describes how certain knowledge that is utilised in research can be interpreted, used, gathered and described in order to ground the research within a scientific philosophical standpoint. According to Guba & Lincoln (1994) a distinction between four paradigms exists, respectively these are: (1) positivism, (2) post positivism, (3) critical theory and (4) constructivism. The four paradigms indicate different epistemological views (Guba & Lincoln, 1994). In line with the research, the fundamental differences between qualitative and quantitative research are also displayed by the paradigms. Guba & Lincoln state that quantitative research belongs to the positivist and postpositivist paradigms, which is focused on reality. Reality in this case means that there is only one 'real' truth which the research can uncover. According to Sale et al. (2002) this means that within this paradigm, only an objective reality exists which is independent from subjective human interpretation or perception. On the other hand, qualitative research is based on the 'idealist' perspective instead of the 'realist' perspective (Sale et al., 2002). Within idealism there is not just one single objective truth and reality, but reality is constructed based on how individuals or groups perceive and interpret their surroundings (Guba & Lincoln, 1994). In layman's terms this means that everyone has a different personal idea of what reality and truth means to them. Since this research is qualitative, the relevant research paradigm will either be aligned with the critical theory perspective, or the constructivist perspective (Slevitch, 2011). Based on the four paradigms mentioned in Guba & Lincoln (1994) and an overview of research paradigms and the qualitative approach in Slevitch (2011) a deduction can be made in what paradigm this research will fall. Based on the contents of the aforementioned articles, the decision has been made to place this research into the constructivist paradigm based on the fact that this research will use qualitative methods, with a basis on other people's views, how developer obligations in the Netherlands are used and sustainable in practice in independent case studies. The goal is not generalisation, but to be able to draw context-specific conclusions which can add to the existing knowledge on land-based finance and the use of developer obligations. Criticism can be given based on the fact that qualitative research does not come up with 'objective' truths which cannot be generalised. Generalisation is not always a research goal. This research focusses on creating a deeper understanding on the use and sustainability of the developer obligations method as a land-based finance tool for Dutch municipalities. According to Bryman (1988) in Slevitch (2011) the aim of a qualitive research, along with the respective research paradigms, is to generate better understanding of a certain phenomenon from a viewpoint of the research subjects. In addition, a qualitative study might not be able to generalise findings on a large scale, but it will be able to provide a thorough and content-rich description about the researched phenomenon using first and second-hand experiences, meanings, interpretations and contexts (Guba & Lincoln, 1994).

2.2.2 Relevant theories

This paragraph will cover theories which can be related to the research. The main difference between the literature review in paragraph 2.1 and this paragraph is that the literature review aims to explain and provide concepts and information which can be used to support the conceptual model based on the content. A review of prior knowledge is necessary to provide background knowledge which this research leans on. Theories, on the other hand, provide the chance to support the research on a higher theoretical level. Instead of merely explaining how certain concepts work, the theoretical framework analyses which overarching theories can be connected to this research, and how those theories might influence concepts discussed in the literature review. The function of the theoretical framework is thus to lay a theoretical foundation for future theory testing, contribution and potential development of new theoretical knowledge (Rocco & Plathotnik, 2009).

Within this theoretical framework, two theories will be highlighted. The first theory which will be discussed is Negotiation Theory. Negotiation Theory, as the name implies, provides a theoretical structure for negotiations between stakeholders at various levels. This theory is highly relevant since the implementation and success of developer obligations is correlated with the respective negotiations (Muñoz Gielen & Lenferink, 2018). Multiple aspects of the theory will be discussed, and its potential impact on the research.

The next theory will be Policy Change and Implementation Theory. This theory provides a theoretical basis on how policy changes and implementation work in theory, and what effects this can have on policy outcome. This is a relevant theory since the use of developer obligations in the Netherlands is partly a consequence of a change from active land policy to facilitating land policy (Hendricks et al., 2021). Therefore, policy and the use of developer obligations are connected. Furthermore, policy outcome can be connected to the sustainable urban development goals municipalities have drafted. In light of this theory a connection can be made between policy implementation and success regarding the future of urban development. Aspects of the Policy Change and Implementation Theory will be used to provide a theoretical grounding to support the research.

Theory A: Negotiation Theory

Negotiation theory focuses on the bargaining process between parties which have a conflict of interest, and thus have to negotiate in order to come to a consensus. The science behind negotiation theory is a mix of economic-mathematical approaches combined with socio-psychological approaches, and is valuable to be used when investigation scenarios which touch upon finance as well as social interaction (Caputo, 2015).

The definition of negotiation differs depending on the literature. According to Akinlua (2020) negotiation is an important tool which is used for conflict resolution, and is meant to be used in order to reach a compromise between parties with conflicting views and interest. Caputo (2015) defines negotiation as a process which is an essential and fundamental moment in time for the life of a business, organization or institution. The difference between negotiation as a tool and negotiation as a moment in time is made clear when reviewing existing literature. In essence both the definitions are correct, negotiations can be used as a tool in a certain moment in time. Furthermore, negotiations seem to be opportunistic by nature, and driven by the self-interest and preferences of stakeholders within a project or venture (Caputo, 2015, Holsen, 2020). Using the aforementioned theoretical definitions, a usable definition can be comprised. Within this research 'negotiation' is defined as a tool which parties with opposing interest use in order to reach consensus within a particular timeframe.

But within the realm of negotiation theory the literature makes a clear division between distributive and integrative negotiation. According to McCarthy & Hay (2015) this division can be attributed to the values which parties have relative to the subject of negotiation. Distributive negotiations are based on the premise that when one party wins, the other one loses. This is most common in price negotiations between parties (McCarthy & Hay, 2015). This can also be named a 'win-lose' situation or a zero-sum game. On the other side of the spectrum integrative negotiations embrace a 'win-win' mentality, herein the goal of the negotiation is to come to an agreement which can be mutually beneficial. In reality, distributive negotiations are one-dimensional while integrative negotiations are multi-dimensional (Holsen, 2020). Another notable difference is that integrative negotiations tend to focus on interests instead of positions within a negotiation. Fisher et al. (1991) explain this concept using a bargaining method to lower the prices of an object. The position of the negotiation is the lowest price a bargaining customer is willing to pay, while the interest of the customer is to pay the lowest possible price. Within integrative negotiations positioning tends to lead to early failure, and negotiating based on interest is key (Fisher et al., 1991). But for this reason, integrative negotiations are the most demanding, challenging and difficult negotiations (Holsen, 2020). In the case of this research, integrative negotiations are used when negotiating developer obligations, since many different interests are at the forefront of the negotiations.

Trust is one of the most influential factors within negotiations, especially integrative negotiations are heavily dependent on trust between stakeholders. Kong et al. (2014) found that a higher level of trust within negotiations leads to integrative behaviour among stakeholders, paired with more transparency. These factors promote a potential 'win-win' outcome for the involved parties. However, a lack of trust can lead to the integrative negotiation process falling back into distributive negotiation, which decreases the chance of a potential 'win-win' outcome.

According to Lewicki & Polin (2013) trust can be expanded into several types of trust within the negotiation process. Trust, just as the negotiations itself, is dynamic and affective to change. Four stages of trust can be distinguished based on their work. (1) Deterrence-based trust. This is the basic,

minimum-level of trust which consists primarily on the belief that the other party will stay true to their word, with negative consequences following a breach of trust. (2) Calculus-based trust, based on deterrence but with the added factor that trusting the other party will have positive results later in the process. At this level of trust, rationality is the key driver and trust should be a calculative choice by all involved parties in the process. Calculus-based trust is likely to be maintained if the stakeholders know that they will have to cooperate in the future and if their reputation is based on each other's relationship. (3) Knowledge-based trust is more advanced, and is based on the notion that a stakeholder has enough knowledge to accurately predict motives, interests and intentions of the other party. (4) Lasty, there is identification-based trust. This level of trust is most common within integrative negotiations between parties who get along relatively well. Trust at this level is often so strong that the stakeholders do not feel the need for third-party control or surveillance. Because of this, identification-based trust is the highest level of trust, but also the most likely scenario in which one of the stakeholders can experience betrayal or blindsiding (Lewicki & Polin, 2013). It has to be mentioned that trust is a prerequisite for successful negotiations. Without trust the negotiating parties will not be able to make ample progress. In the next section, further success factors of negotiations will be discussed according to Negotiation Theory.

According to theory, the stakeholders which negotiate have to possess the right skillset in order to negotiate well. For integrative negotiation this entails that the negotiators must be able to invest a lot of time into carrying out complex discussions, as well as having the competence for negotiating in the first place (Holsen, 2020). In addition to that, the negotiators have to be able to consider trustworthiness of other stakeholders, and evaluate gains and risks within the heat of a negotiation. The ability to cooperate and finding mutual gain is also of importance (Fisher et al., 1991, McCarty & Hay, 2015). But within negotiation theory the concept of 'bounded rationality' is key. This means that no negotiator will be perfectly rational, and that actors suffer from imperfect rational thought in general. Negotiators will face emotional and cognitive challenges when negotiating, which can limit their success within the negotiation process (Caputo, 2015). Next to that, information asymmetry can play a role in the outcome of the negotiation. This means that some parties in the negotiation process have access to less information, which gives them a disadvantage. This can make them lack knowledge about situations, interests or other stakeholder's behaviour.

If the aforementioned factors of successful negotiation are implemented into negotiations, reaching an agreement is not a given. Extremely conflicting interests, blindsiding, stubbornness or irrational decisions are factors which negatively influence negotiation outcomes (Holsen, 2020). But even if parties come to an agreement, the outcome will most likely be imperfect. According to Sebenius (1992) in Caputo (2015), the possibility always exists that negotiating parties leave value on the table.

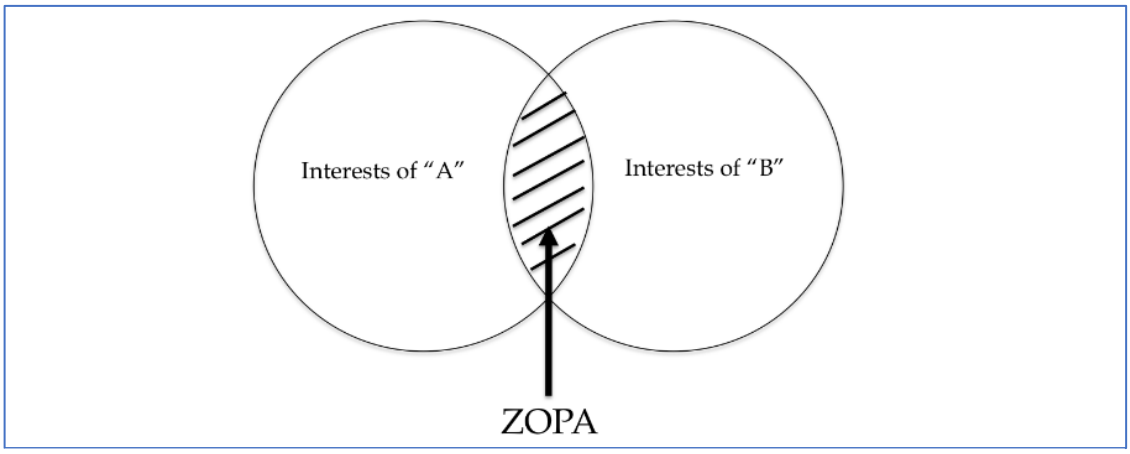

Figure 2: Graphical representation of the Zone of Possible Agreement (Caputo, 2015).

This means that stakeholders have failed to capture all of the potential gain from the negotiations, due to aforementioned negative influences or a stronger opposing party. Sebenius mentions that every negotiation has a Zone of Possible Agreement (ZOPA). This is displayed in figure 2. The ZOPA is a Venn-diagram that can be interpreted as the surface area in which the interests of two parties meet. The further away the interest lies from the intersection, the less likely it is that that interest will be represented in the agreement (Sebenius, 1992 in Caputo, 2015).

Negotiation Theory does not end at the end of an *integrative* negotiation. The theoretical background surrounding Negotiation Theory is broader and contains many negotiation approaches, but for the purpose of this research integrative negotiations are the most relevant because of the multi-dimensionality, multiple interests and stakeholders in a potentially 'win-win' environment with challenging negotiations, much like negotiations between municipalities and property developers. And according to Caputo (2015) and Holsen (2020) integrative approaches are most common when dealing with real estate and area developments. Therefore, a theoretical insight in negotiations is extremely valuable in order to see if the negotiation process, according to public officials, influences the use and sustainability of developer obligations for future sustainable development. Making use of Negotiation Theory, this research will be able to determine if the results show confirmation or discrepancy towards the theory.

Theory B: Policy Change and Implementation Theory

This paragraph focuses on the theory behind policy change, and how policy change relates to policy implementation. This is relevant for this research because of the policy change towards facilitating land policy instead of active land policy by Dutch municipalities (Hendricks et al., 2021). Next to that, policy implementation theory looks at success factors for policy decisions, which is also relevant when looking at the finance method of developer obligations, since this is rooted within facilitating land policy.

Policy change is not the same as policy reform, but the terms are used interchangeably in literature. Cerna (2013) distinguishes the two. Policy change can be explained as change within a policy itself, or change in policy which is induced by external factors. Policy reform refers to the broader change of policy on a national or international scale, and is correlated with improving the existing systems and their response to future developments (Cerna, 2013).

Policy change, or the lack of policy change can be explained using a variety of frameworks. The first relevant framework is the *path dependence framework*. This framework explains why it is more likely for policy to continue developing instead of entirely changing. According to Greener (2002) it is very challenging to inherently change policies because organisations tend to want to stick to familiarities. In addition, Greener (2002) shows that actors within the policy process defend existing policy, even if it is suboptimal for the current situation. The question can be raised if actors in a changing policy landscape still act in favour of the previous policy framework. The path dependence approach suggests that this is possible (Greener, 2002).

The second framework is the *Advocacy Coalition Framework* (ACF). This approach is based on theory from Sabatier & Jenkins-Smith (1988). The starting point of the theory is that policy change requires external shocks. Four types of shocks can be identified based on the literature. (1) Socio-economic changes, (2) shift in public opinion, (3) changes in government and (4) impacts from other policy systems (Nohrstedt, 2005). The approach is named ACF because the idea of a ‘coalition’ represents a similar way of thinking when it comes to public policy and the values which are taken into account when developing public policy (Cerna, 2013). The most important takeaway from the ACF method is that policy change is likely induced by external shocks instead of internal change.

Another framework which is used look at policy change is the *policy learning* framework. Policy learning has a strong link with the aforementioned ACF approach, because in the ACF approach learning which values have to represented in policy is also a type of policy learning (Sabatier & Jenkins-Smith, 1988). Policy learning can alter a coalitions belief system through own experience, or experiences from other coalitions. The learning aspect focuses on specific methods, techniques and processes in order to improve or change existing policy. Related to this is the last framework which will be discussed within Policy Change Theory, *policy diffusion*. This is a process in which policy spreads between governments and levels of government (Cerna, 2013). According to Shipan & Volden (2008), four main mechanisms exist within policy diffusion. (1) Learning from early adopters, (2) economic competition, (3) imitation and (4) coercion. Learning from early adopters happens based on success stories from other governments, and gives the policymakers extra tools when considering new policy. Economic competition is a driver of itself which leads to regions adopting similar policy to stay economically relevant. Imitation is a complete adaption of successful policy, without the learning factor from early adaptations. The last mechanism is different since coercion is based on adopting different policy through international trading sanctions (Siphan & Volden, 2008).

The information given above about policy change is crucial when looking at successful policy implantation and execution. Policy changes and implementation are connected, and many attempts fail because no attention has been given what causes policy change, and how actors reacted to those changes. That is why the following paragraphs will look at Policy Implementation Theory after a policy change.

Policy implementation can be defined as the application of a policy decision in the real world. Merely creating policies does not mean that they will be successful, and literature has shown that implementation is a major determining factor when it comes to policy outcome (Cerna, 2013). However, it is challenging to provide an exact number of reasons which factors or conditions lead to successful policy implementation, because it depends a lot on the political environment, economic trends and the societal context. Because of this, 'the perfect' policy implementation does not exist in general. However, the literature does provide frameworks which can analyse implementation approaches in order to get a clearer view of implementation success.

The first framework is an analysis of top-down, bottom-up and combined approaches (Cerna, 2013). The difference between top-down and bottom-up is the level at which the policy is made. A top-down approach views policy as the outcome of a process by central actors, while bottom-up policy focuses on creation at the local level, with the help of local stakeholders (Matland, 1995). A strength of the top-down approach is that the type of policy will be more generalisable, and could be implemented differently with slight alterations. A weakness is that implementation is seen as too administrative and bureaucratic (Matland, 1995). The strength of the bottom-up policy lies in its context. Locally made policy will acknowledge local stakeholders and their interests more than central made policy. But the caveat is that this approach tends to overestimate the power and importance of local politics in comparison with central legislation (Matland, 1995). According to Cerna (2013) a better approach would be to combine the two methods. This is because policy implementation affects a large group of stakeholders, on different levels of government. Both the central and the local view are thus important when implementing policy.

Next to the type of approach, the literature provides a sample of prerequisites for successful implementation. According to Gornitzka et al. (2005) in Cerna (2013) six variables are of importance when considering implementation success. (1) Policy standards and objectives: the aim of the policy. (2) Policy resources: the funds made available for that policy. (3) Inter-organisational communication and enforcement: sharing of knowledge between departments. (4) Characteristics of implementing agencies: the size, skillset and general competence of the responsible team. (5) the trends surrounding politics, the economy and social conditions and (6) Nature of the implementers: the underlying motivations, rationality and attitude of the implementer.

Based on these six variables by Gornitzka et al. (2005) in Cerna (2013) the assumption can be made that the implementation is also highly dependent on the implementor. And when it comes to successfully implementing developer obligations, the characteristics as well as the disposition of the public official can be deciding factors. The Policy Change and Implementation Theory will provide structure when analysing municipal policy regarding land, development, finance, cost recovery and sustainable development in the light of the changes within the policy frameworks. Policy changes can be analysed, as well as consequences for the implementation of policy based on the approaches and variables. The results of the research will determine if discrepancies or confirmations with the theory are present.

2.3 Conceptual framework

Based on the literature review and the theoretical framework, a conceptual framework can be constructed. A conceptual model is a visual representation of variables within research. Since this conceptual model will be constructed before the research has been done, a draft version will try to locate relationships between key variables related to the research questions.

This conceptual model displays what variables affect the use of developer obligations within Dutch municipalities in order to find out if the land-based finance method of developer obligations is sustainable enough for (future) sustainable urban development. The following model has been constructed, displayed in figure 3.

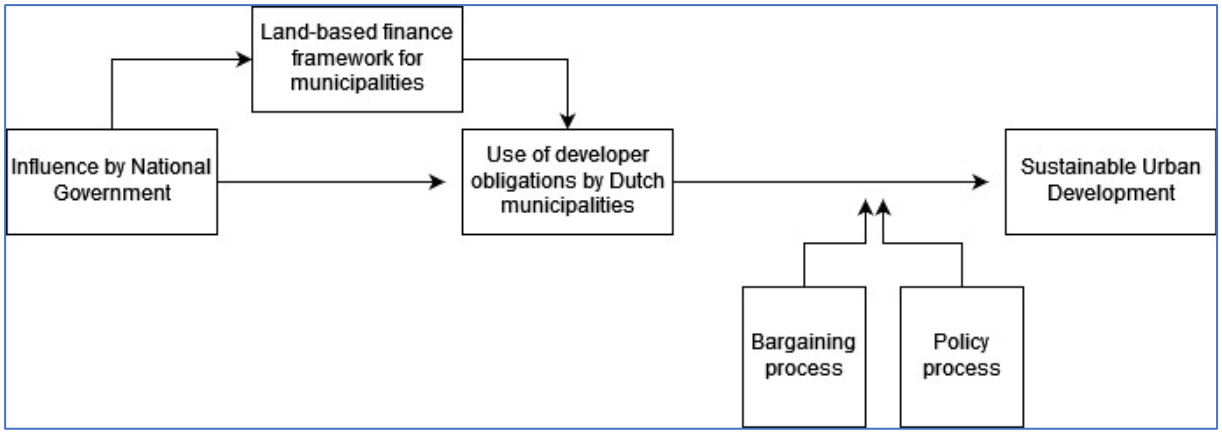

Figure 3: Conceptual framework

The exogenous variable of 'influence by National Government' has an effect on the framework which municipalities can use when it comes to land-based financing, and thus has an influence of the framework itself, as on the use of the developer obligations.

The variable 'land-based finance framework for municipalities' has an effect on the use of developer obligations since the framework determines which methods can be used, and in the current policy setting, which methods work the best for each municipality (Hendricks et al., 2021).

The relationship between the variable 'use of developer obligations by Dutch municipalities' has an effect on 'sustainable urban development'. This is because land-based finance methods can be used in order to capture value which can be used to invest within the municipality (Lord et al., 2019). However, according to the literature review and the theoretical framework there might be moderating variables which influence the successful use of developer obligations and its effect on sustainable urban development. These variables are explained in the theoretical framework, and are grouped under 'Bargaining process' and 'Policy process', implying that they stem from Negotiation Theory and Policy Change and Implementation Theory. The research results will determine if indeed, these variables play a role within the successful implementation of developer obligations and their effect on sustainable urban development. However, it may also be possible that additional variables or relationships are found when the research has been completed. If this is the case, the conceptual framework will be adapted after the presentation of the results.

3. Methodology

This chapter focuses on the methodology of the research. The following attributes will be discussed within this chapter. Firstly, the research design will be laid out. The research design encompasses the overall strategy that has been used to carry out the research. The elements that are used and the choices that are made within the construction of the research design determine the content for the remaining paragraphs of this chapter. After this, the requirements, collection and analysis of necessary data will be touched upon. This ensures a clear connection between the need for specific data, ways in which it has been gathered and the analysis that has taken place with the relevant data. Lastly the elements of validity and reliability will be discussed with regards to the research method.

3.1 Research design

Qualitative methods

The overall strategy which has been used in this research is a qualitative research strategy. This means that the research focuses on qualitative data in the form of interviews. According to Creswell & Poth (2018), qualitative research is suitable when exploring a research subject which needs further clarification, while also at the same time being able to provide in-depth, complex and detailed understanding of the issues at hand. In the case of this research this will be a valuable asset of the qualitative research method.

Furthermore, this research has an exploratory and an explanatory point of view. The exploratory view comes forward in the aims to clarify how developer obligations are used in Dutch municipalities in practice. This will be researched because the available literature lacks information on this topic for specific case studies. This will provide a deeper understanding of the specific finance method instead of a general explanation which is most prevalent in the available literature. The exploratory element is discussed and analysed in sub question 1. Sub question 2 and 3 will provide the explanatory element of the research, and will use the qualities of qualitative research methods in order to explain why sustainable urban development can or cannot be achieved using the developer obligations method and available financing framework. Next to that, the qualitative method allows participants to voice their professional opinion on the sustainability of the method in a larger context of the financial framework, and what potential factors influence the usability of the method.

Building upon this, the results of the analysis of the qualitative data will be compared with the theory on negotiations and policy change and implementation. Doing this will provide a basis in order to expand the existing theory or add to the interpretation of the data using theory. An explanation for the reason why the method is currently perceived as inadequate might be grounded in Negotiation Theory or Policy Change and Implementation Theory discussed in chapter 2.

According to Creswell & Poth (2018), qualitative methods can both be forms of inductive and deductive research. Inductive research can be seen as exploratory or descriptive, and is used when there is little known about the research subject. Inductive research strives to create new theoretical knowledge based on the data which has been gathered (van Thiel, 2014). On the other hand, deductive research starts at a certain level of theoretical knowledge and tries to explain a certain phenomenon using a theoretical framework. The main difference between the two methods is that deductive research uses previous theoretical knowledge to see if it holds true. This research uses both methods, since both the aforementioned exploratory and explanatory elements are prevalent.

Case area selection

Instead of performing a regular case study, which encompasses a holistic approach (van Thiel, 2014), this research will benefit from selecting case areas which do not require a complete analysis of the entire case entity. As a consequence, not all characteristics of a specific case have to be mentioned or analysed, merely the relevant ones which can contribute to the research are sufficient. Thus, the methodology differs from a regular case study, and instead opts for *case areas*. Case areas can vary in size, and include neighbourhoods, towns, cities, regions, countries or continents (van Thiel, 2014). Cases do not need to be rare or 'special', the use of everyday cases can help confirm or deny earlier theory or assumptions. This makes case studies a valuable means of contribution to the scientific debate. Furthermore, when understanding at a deeper level is the goal, case studies can provide this because of their natural inclination to be studied at a closer level, the researcher aims for depth on a specific topic instead of general knowledge (van Thiel, 2014, Creswell & Poth, 2018). The missing information on the topic of land-based finance and developer obligation is largely focused on their practical use instead of their theoretical use in the Netherlands. By conducting case studies, the general theoretical knowledge can be further expanded upon. In addition, the use of multiple case studies will show similarities or differences between the cases which is useful when comparing the practical use of the developer obligations method in the Netherlands. Next to that, it is also helpful when comparing aspects about the future use of developer obligations as a sustainable finance method for urban development.

The cases used in this research need a certain method of selection. Van Thiel (2014) provides different points of view on how to select cases, and how case study selection can influence the potential outcome of the research. For the sake of this particular research which focuses on Dutch municipalities, it is important to make a selection of relevant selection criteria.

National policy has the aim to develop new urban spaces in existing urban areas (Rijksoverheid, 2021). Therefore, the first criterium is to let the cases fall into an 'urbanized' category of municipalities. According to the Organisation for Economic Co-operation and Development (OECD) functional urban areas in the Netherlands can be classified as separate economic units, mostly classified as cities with a large commuter zone (OECD, 2019). The OECD also makes a distinction on population level between small (50.000-100.000), medium-sized (100.000-250.000), metropolitan (250.000 – 1.500.000) and large metropolitan (1.500.000+) functional urban areas. In short, urbanised areas in the Netherlands can be classified as cities, and a distinction between small, medium, metropolitan and large metropolitan cities can be made. However, population count is not a sole determining factor when taking into account the geographic spread of cases in a study. Cities which are physically close can be similar, even if population is taken into account. It is therefore important not to select cases which are clustered together in order to take geographic variation into account. Next to that, variation in (regional) culture may influence the thinking and negotiation process (Gelfand & Brett, 2004). Geographic variation which takes cultural spread into account is therefore a positive selection criterium. Based on the aforementioned criteria, the cases should be cities with a varied population with a large commuter network located in different parts of the country in order to take geographic and cultural differences into account.

The Dutch Interdisciplinary Demographic Institute has published an article which differentiates Dutch cities based on their location. According to the institute, the Netherlands can be divided into three different parts (1) *Randstad*, (2) *Intermediate area* and (3) *Periphery* (NIDI, 2018). The differentiation is shown in figure 4. The Randstad is the lightest area, with the biggest 4 cities highlighted in dark red. The intermediate area is the light green area, switching to dark green for the periphery. These areas differ when it comes to demographics, economic power and specific future challenges. Choosing cities based in one specific area would lead to a clustering on geographic and cultural basis. Thus, a mix between the three areas is preferable.

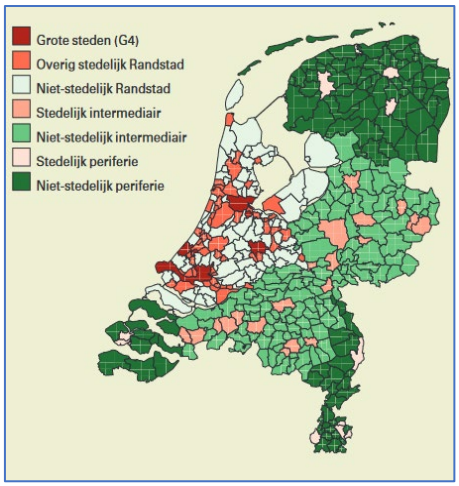

Figure 4: Randstad - Intermediate - Periphery model of the Netherlands. (NIDI, 2018).

However, next to the use of developer obligations it is important to keep in mind that this study will compare sustainable development goals between different cities. Therefore, a few selection criteria have been applied to narrow down the search.

1. The city has to have a foothold in the region in order to make sure it contains ample urban developments to be discussed within the case studies.
2. The city needs an influx of continuing challenges regarding sustainable urban development in the present and future.
3. The cities must vary in population, but must have a starting population of around 50.000-100.000 inhabitants to make it at least qualify to be a small urban functioning area (OECD, 2019). Medium-sized, metropolitan and large metropolitan cities are taken into account as well.
4. Preferably the city has a stand-out urban development goal which they want to reach in the future.

Based on the aforementioned selection criteria the decision has been made to select the following municipalities. (1) Utrecht, (2) Eindhoven and (3) Maastricht. The municipalities all are urban municipalities, which are at the forefront of future challenges according to the Dutch government (Rijksoverheid, 2021). Next to that, they are represented within each of the areas in the *Randstad – Intermediate – Periphery* model presented above. This ensures that both cultural and geographic clustering is not present, which leads to a higher level of external validity compared to clustered cases. In addition, the cities are the largest (by population size) in their respective provinces of Utrecht, Noord-Brabant and Limburg. This will lead to ample information being available when it comes to policy documents, ongoing development projects and future challenges which the cities will face.

3.2 Data requirements, collection and analysis

This paragraph will shortly explain what the requirements are for the relevant data for this research. Next to that, the data collection process and the analysis of the data will be discussed.

Data requirements

The required data for this research differs when looking at primary and secondary data. The difference between the two is that primary data is collected by the researcher, while secondary data is collected by earlier sources. Both data sources can cover the same topic, but have different uses and forms. The primary data within this research are expressed in the form of semi-structured interviews. The secondary data to support the analysis will consist out of government publications, policy documents, financial records and reports.

According to Alshenqeeti (2014) the method of using interviews to collect data is highly relevant in research since it can be used to observe events or interactions which otherwise would not have been observable, either through impossibility or through a lack or numerical data. Furthermore, interviews are interactive and in real-time. The researcher will be present, and is more involved with the research subject compared to a questionnaire. As a result, the researcher can press for complete, clear answers from the research subject. Next to that, the interviewer can ask probing questions in order to dive deeper in a particular part of the interview. These qualities of the interview method ensure that interviews are expected to broaden the scope of the research topic (Alshenqeeti, 2014), which is one of the aims this research tends to fulfil.

The type of interview matters. Alshenqeeti points out that there are three main methods of one-on-one interviewing. Respectively these are (1) structured, (2) unstructured, and (3) semi-structured interviews. This research will make use of semi-structured interviews. This decision is based off the consideration that structured interviews are too limited in their answering structure and leave little room for probing questions and moments of spontaneity. On the other hand, unstructured interviews offer too little guidance when structurally answering questions. As a method of research, the semi-structured interview method is preferable because of both its structural integrity and leeway it can offer. An interview guide will be constructed in order to structure the interview questions beforehand. Because an interview guide is used, each interview will have roughly the same structure and consistency. This will contribute to the way in which the interviews will be analysed. The interview guide is visible in the appendix, paragraph 8.1.

The method of using semi-structured interviews fits the research question and research aims. Interviews can be used in order to find out how the cases (municipalities) use the land-based finance method of developer obligations, and what the consequences are for sustainable urban development in their municipality. Using interviews on a case study basis, both the exploratory and explanatory elements of this research will be fulfilled. The interviews will give both a case-specific overview of the use of developer obligations as a sustainable financing method, as well as a general overview of its shortcomings when looking at sustainable urban development.

Data collection

In case studies it is important to know where the relevant primary and secondary data can be found, and how data can be collected in the right way.

The primary data, semi-structured interviews, has been collected by recording the audio of the interviews between the researcher and the interviewees. Since the research question is geared towards the use of the developer obligations method by municipalities, the interviewees will be public officers who are currently working with such a method in urban developments. Not every public officer works 'at the frontline' of negotiations with developers, thus selecting certain job titles is key in order to find the fitting participants for this study. Varied relevant professions have been found. Finding at least one Urban Feasibility Analyst (Planeconoom) for each municipality was necessary since they lead the negotiations when it comes to financial feasibility and cost recovery. The tables 2, 3 and 4 below show professions of the interviewees, for Maastricht, Utrecht and Eindhoven respectively. As the interviewees remain anonymous, no names will be displayed. Also, the right column shows the number of interviews and to which interview each interviewee belongs.

Interviewees Maastricht	**Profession**	**Interview**
#1	Project Leader – Urban Developments	1
#2	Senior Urban Feasibility Analyst (*Planeconoom*)	2
#3	Manager City Planning	2
#4	Director Project Development & Real Estate	2
#5	Manager Municipal Real Estate & Land Policy	3

Table 2: Overview of interviewees from the municipality of Maastricht

Interviewees Utrecht	**Profession**	**Interview**
#1	Senior Real Estate Advisor	1
#2	Senior Urban Feasibility Analyst (*Planeconoom*)	1
#3	Area Coordinator	2
#4	Senior Project Manager – Urban Developments	3
#5	Senior Urban Feasibility Analyst (*Planeconoom*)	4

Table 3: Overview of interviewees from the municipality of Utrecht

Interviewees Eindhoven	**Profession**	**Interview**
#1	Urban Feasibility Analyst (*Planeconoom*)	1
#2	Senior Portfolio Advisor Urban Developments	2
#3	Policy Advisor Land Development and Cost Recovery	3

Table 4: Overview of interviewees from the municipality of Eindhoven

In order to get results which are representable for each case, multiple public officers have been interviewed of each municipality. This will correct for potential bias from the interviewees side, and will also provide more data for the research. The number of interviews which have been completed depends on the principle of saturation (Creswell & Poth, 2018). Saturation means that there have been enough interviews in order to answer the research question thoroughly. Because the interviews have been approximately an hour long on average, with high information density, saturation has been reached for each municipality. In total, 10 interviews with a total of 13 interviewees have taken place. Next to one-on-one interviews, group interviews have taken place due to tight schedules, both from the municipalities' side and the research timeline. Group interviews have the benefit that interviewees can comment on each other's answers, and provide further clarification. In practice, the group interviews are denser in information because of this. Lastly, the secondary data which will be used to introduce and further analyse the case studies can be found on the internet, in the form of policy documents, public statements or archived (financial) records.

Data analysis

After having collected enough interview data in order to answer the research question, the data has to be analysed. According to van Thiel (2014) the two premises of qualitative data analysis are to acknowledge that qualitative data analysis is an iterative process, but that a systematic approach to analysis is necessary in order to achieve a certain level of reliability and validity.

In order to analyse the data systemically, the software programme ATLAS.TI has been be used. ATLAS.ti is useful for handling large batches of qualitative data, and analysing it using codes, quotations and groups. The coded data can be used in order to find answers to the research questions in a systematic way. This is key when analysing large quantities of qualitative data, because unlike statistical programmes the answer does not present itself at the click of a button (van Thiel, 2014). Furthermore, Creswell & Poth (2018) mention that qualitative data analysis is both inductive as well as deductive. In practice this means that the coding and systematic analysis of the dataset will happen based on earlier theory (deductive), but once that process has been completed, the internal structure of the dataset will be analysed in order to see if additional codes can be found (inductive). This process confirms the aforementioned two premises of qualitative data analysis by van Thiel (2014).

For this research, the coding process within ATLAS.TI is based on the *operationalisation matrix*, a document that contains the variables shown in the conceptual framework with additional sub-variables and questions that are used in the interview guide. The operationalisation matrix is shown in the appendix, in paragraph 8.2. The operationalisation matrix has been peer-reviewed in order to ensure correctness and a higher degree of accuracy of the measuring instrument. Table 5 has been constructed to display the code groups and codes used for the analysis of the interviews. In total, 971 codings have been done, with 47 individual codes spread over 7 code groups.

Code group + (number of codes)	Codes + (number of codings)	Total codes per group
Bargaining Process (7)	Capacity (19), Hindrances (50), Improvements (16), Other (24), Outcome (27), Relations (35), Skills / Knowledge (27)	198
Influence National Government (5)	Financial Dependency (27), Legislation (24), Negative Influence (34), Positive Influence (3), Urban Development (22)	110
LBF Framework Municipalities (4)	Application (25), Improvements (9), Insufficient (19), Sufficient (4)	57
Policy Process (8)	Adaptation (13), Capacity (25), Deterrence (17), Deviation (11), Improvements (27), Other (10), Practical Implementation (42), Skills / Knowledge (11)	156
Sustainable Urban Development (5)	Challenges (40), Financial Stress (29), Negative Impact (33), Positive Impact (10), Sufficiency of Finance (6)	118
Use of DO Dutch Municipalities (15)	Alternative Financing Off-site Infra (15), Cost Recovery Maximum (7), Cost Recovery Optimal (22), DO Creation Considerations (38), DO Creation Necessity (8), DO Creation Role of DO (15), DO Implementation (Imp.) General insufficient (13), DO Imp. General Sufficient (4), DO Imp. Off-site (28), DO Imp. Off-site sufficiency (14), DO Imp. On-site (12), DO Imp. On-site sufficiency (9), DO Imp. Other (27), DO Imp. Sustainability (13), DO Improvements (41).	238
Market Structures (3)	Business Case Developments (47), Demographic Developments (17), Economic Developments (30)	94

Table 5: Overview of the used codes, code groups and frequencies in ATLAS.TI.

During the coding process, the interviews showed a strong focus on a developer's business case, as well as demographic and economic developments in the municipalities. Therefore, it was decided to add these three codes and place them into a group called 'Market Structures'. This process shows that qualitative research is also inductive, as additional codes were found during the process itself (van Thiel, 2014). Additionally, the average codes per interview were relatively similar across the whole dataset: Maastricht (97), Utrecht (98) and Eindhoven (101). A margin of 4 codes per interview on average is small, indicating that the information density was on a similar level. An overview of the codebook in ATLAS.TI can be found in the appendix, in paragraph 8.3.

3.3 Validity and reliability

This paragraph will briefly explain the concepts of validity and reliability based on literature, as well as explain their importance and applicability for this research. The degree to which this research is viable and reliable is discussed in the reflection in paragraph 6.2.

Validity

According to van Thiel (2014) validity is a construct that has to be differentiated into internal and external validity. Internal validity refers to the ability of the research method to actually measure the effect or relationship between variables. Van Thiel argues that a researcher can improve the internal validity in two ways. The first is a clear operationalisation of concepts within the research. If concepts are operationalised well, meaning that they are translated from theory into measurable or observable constructs, the internal validity improves. Next to that, the internal validity will be improved if the presupposed theoretical relationship between variables is actually proven or disproven because of the research. However, it is hard to gauge this element of internal validity before data analysis has taken place (van Thiel, 2014). External validity can be described as the level of generalisation of a study. This has a strong connection to the research method.

For the specific research method of qualitative case studies, the external validity can be quite low when comparing it to large-scale quantitative studies. However, the goal of a qualitative study is not the same, as the added value of qualitative case study research is to go in-depth into certain cases with the goal to develop new theories, or at least add to existing ones. This process is called analytical generalisation, and will be applied in this research (van Thiel, 2014). Next to that, the researcher can improve the validity of case study research by applying the concept of triangulation. Triangulation refers to the use of several methods of research, analyses and theory. Hales (2010) defines several methods of triangulation (1) data triangulation – using a variety of sources of information in order to explore and answer the research question. Applying varied points of view by other scholars, reports and secondary data are valuable for the validity. (2) Methods triangulation consists of using multiple research methods, for example desk research and semi-structured interviews in order to compare findings. (3) Investigator triangulation – using multiple researchers or peer-reviewers during the research process in order to confirm findings. Lastly (4) theory triangulation, tackling the research problem from multiple theoretical perspectives can uncover similarities and differences within findings, which benefits the validity of the research (Hales, 2010).

Reliability

Reliability is about the accuracy and repeatability of the research (van Thiel, 2014). Accuracy refers to the measurement instrument which is used to conduct the research. In this case, it refers to the ability of the interview guide to produce similar results when using the same questions. This can be tested by doing the interviews and having the interview questions peer-reviewed by a researcher before the interviews take place. Repeatability, also known as consistency, is hard to achieve within the social sciences (van Thiel, 2014). This means that not the interview guide, but the whole research should be able to be replicated under the same circumstances, with the same outcome. Because the case study method using semi-structured interviews is dependent on many external variables, complete repeatability is hard to achieve. The good news is that certain levels of reliability and validity can be guaranteed if certain factors are taken into account. According to van Thiel (2014), these are: (1) taking into account that researchers are only human, and benefit from feedback during the process. (2) Measurement instruments should be tested and peer-reviewed before actual use. And lastly, (3) keeping in mind that the units of study can be biased as well, and that probing questions are necessary in some situation to prevent affirmation bias. Keeping these factors into account will improve reliability and validity.

4. Dutch municipalities in a financial perspective

This chapter provides a general overview of Dutch municipalities' financial mechanisms and implementation of developer obligations based on secondary sources and literature. Chapter 4.1 will elaborate on how the financing system for Dutch municipalities works. This has a clear connection with two variables in the conceptual model; 'Influence by National Government' and 'Land-based finance framework for Dutch municipalities'. Certain elements within the land-based finance framework will be highlighted and discussed in further detail. Examples of this are public land banking and property taxes. Secondly, the link between municipal finance and developer obligations will be made. The Dutch context surrounding developer obligations will be discussed based on academic and secondary sources. After this has been completed, the land-based finance framework and municipal income framework will be presented, along with its dependence on the national government. This is correlated with the two variables mentioned before.

4.1 Municipal financing and developer obligations in the Netherlands

Before going deeper into municipal finances, it is important to mention that the Netherlands has decentralised government tasks onto local governments. The main municipal tasks are varied and are shortly mentioned below in table 6. Knowing what the primary municipal tasks are puts the financial methods they have available in perspective.

Municipal responsibility in NL	**Explanation**
Records, archiving and documenting	Keep records of inhabitants within their boundaries. Archive property sales and acquisitions. Documentation of inhabitants and handing out official identification documents.
Social Support Act (WMO) and Participation Act	The Social Support Act has been implemented to improve the livelihood of inhabitants whom require care in their home and cannot function in day-to-day tasks individually. The Participation Act supports people who have trouble finding suitable work because of a disability or restriction. The handling of benefits for people with a low income also is included.
Youth Care	The municipality supplies local youth and young adults with care when it comes to education, social problems, psychic problems, abuse, addiction and crime prevention. This task has been decentralised since 2015.
Housing	Dutch municipalities steer the local housing market by making housing policy, implementing zoning plans and making agreements with social housing corporations and developers.
Infrastructure	Local infrastructure development for walking, cycling and driving. Infrastructure for cars such as parking facilities are taken into account as well. Infrastructure provision for and around new urban developments is included as well. The upkeep of infrastructure also must be done by the municipalities.
Public amenities	Finding suitable housing for primary and secondary schools, constructing and subsidizing public facilities such as libraries, community centres, parks, green and blue spaces.
Environment and climate	Implements policy to adapt newly developed space to be sustainable. Local climate adaptation and mitigation measures must be implemented by the municipalities.
Waste management	Handling of local waste, trash and recyclable materials.

Table 6: Short overview of main municipal tasks in the Netherlands. (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021c).

As seen in table 6, the list of responsibilities is varied and large. These tasks can only be fulfilled successfully if there is ample spending room. Municipalities in the Netherlands are largely dependent on the national government for their budget (CBS, 2020). In 2020 the national government's contributions made up 62.1% of the total Dutch municipal budget (Ministerie van Financiën, 2022). This shows that even though Dutch municipalities work as self-governing institutions with their own tasks and responsibilities, their dependence on national contributions is large. The Central Bureau for Statistics (CBS) states that the percentage of national public spending on municipalities can be seen as a gauge for the rate of decentralisation. Contributions to local governments make up 30.4% of national public expenditures in the Netherlands. The average in the European Union is similar with 30.9% (CBS, 2020). However, the key difference is that the income which municipalities generate for the national government is merely 7.9% in the Netherlands while the EU average is 19%. In this aspect the Netherlands differs from traditional decentralised countries, as it is usual that the local governmental income increases when decentralisation increases as well (CBS, 2020). Thus, it can be said that Dutch local governments have relatively little means to generate income compared to the EU average.

4.1.1 Municipal finance in the Netherlands

As mentioned beforehand, a municipality can only function well if their financial needs are met. Dutch municipalities have eight main sources of income (Ministerie van Financiën, 2022). The eight income streams are based on the financial reports over 2020 on a national scale, these are the most recent numbers which are available (Ministerie van Financiën, 2022). Below, table 7 is shown containing the different income sources, together with a short description and the average percentage of total municipal income for the Netherlands over 2020.

Income stream	**Description**	**Average % of total municipal income (2020)**
Municipal fund	Largest income stream for Dutch municipalities, given by the national government. The income is based on a multitude of factors, including population size, the amount of young people in a municipality, the amount of benefit recipients, the surface area of the municipality and the presence of nature (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022b). The fund can be used freely by the municipality in accordance with the council. The fund is not only made to contribute to general costs, but also to costs of decentralised tasks and the integration allowances for newcomers. This fund is linked to real estate tax. The higher a municipalities' income from real estate taxes, the lower the municipal fund will be (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022a).	51%
Specific benefits	Specific benefits (*specifieke uitkeringen*) are subsidized allowances from ministries in order to carry out specific tasks in municipalities. As the name implies, they are specific and have to be used to carry out policy which is decided on a national scale by the central government (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2018). The main difference between the specific benefits fund and the municipal fund is the freedom municipalities	11.2 %

	have when it comes to spending the money, of which the latter allows for more freedom compared to the former.	
Real estate tax	The real estate tax (*Onroerende Zaak Belasting*) is the first local source of income, and can be seen as a method of land-based financing which is widely used across all of the Dutch municipalities. The real estate tax is a method of land-based financing that can be described as value capturing (Peterson, 2008). Increases in property value can be captured by leveraging local taxes based on the virtuous value cycle principle discussed earlier. Land value uplifts, either created by market trends, government intervention or private investments are registered when municipalities are carrying out their yearly property valuation. In return, uplifts in land and property value can be captured by the real estate tax (Centraal Planbureau, 2019).	7%
Other taxes	Other taxes are a local source of income which consists out of multiple forms of taxes. Common taxes used are a parking tax, dog tax and tourist tax (Ministerie van Algemene Zaken, 2021). The municipal council decides the application and framework of the used other taxes in a municipality. However, making up new taxes is against the law and the council can only tax elements which are mentioned in law (*Gemeentewet*).	2.9%
Retributions	Retributions are a form of taxation meant as compulsory payment for service provision (Ministerie van Algemene Zaken, 2021). These taxes are not meant to generate additional income for the municipality. The key difference between retributions and a tax is that the revenue generated by retributions should strictly be spent on amenities and servicing. In essence, cost recovery would be a accurate description of retributions. Forms of retributions are levies on waste management, sewer rights and building permits (CBS, 2022a).	7.3%
Exploitation	This source of income is centred around publicly owned land in the municipality. The exploitation of public land entails servicing the land when it comes to preparing for construction and housing developments. In addition, the placement of amenities and necessary infrastructure is done in order to sell the land to developers or corporations so that housing construction can start. In order for exploitation to work the municipality must be owner of the land. This type of policy is called active land policy, the municipality actively acquires land in order to sell serviced land in the future for a higher price. This method of financing is also a method of value capturing (Peterson, 2008) or land asset management (Peterson, 2009).	5.4%
Reserve withdrawals	Withdrawals from municipal reserves are counted as an income stream by the national government, and can be composed of different reserves (Gerritsen & Allers, 2002), ranging from *free* reserves to policy-dependent reserves. But reserves are finite and require careful financial planning to maintain every year.	5.9%
Other	The last income source that municipalities have is a subdivision of other assets. These include the sale of services, interest revenues, stock options, rents, and	

	revenue from land-leases (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021a). Some income streams can be labelled as land-based financing methods, as land-leasing is an example of using land rent to potentially finance development projects (Peterson, 2009). However, subsidies from provinces and the EU are also counted as other assets. Municipalities are dependent on their own governing of other income streams and can decide how to spend it freely.	9.4%

Table 7: Overview of income streams for Dutch municipalities in 2020. (Data: based on the sources in the text, (Ministerie van Financiën, 2022) for the percentages).

Since other taxes and retributions are made up of many individual aspects, showing a graph of the income generated by the most important ones is beneficial for providing a clear view of municipal finances. This graph is shown below in figure 5.

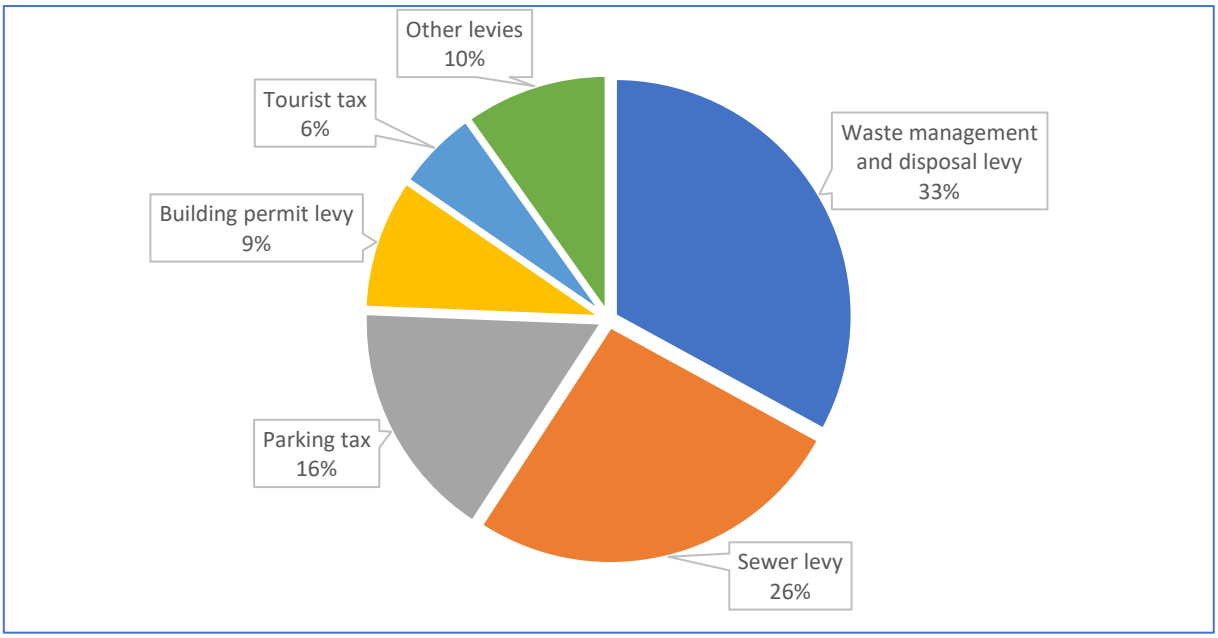

Figure 5: Internal percentages of income sources in 'Other taxes' and 'Retributions'. Own chart. (Data: CBS, 2022b).

Now that all of the important income streams have been discussed, it can be said that Dutch municipalities are highly dependent on the national government for their funding. Figure 6 illustrates this statement below.

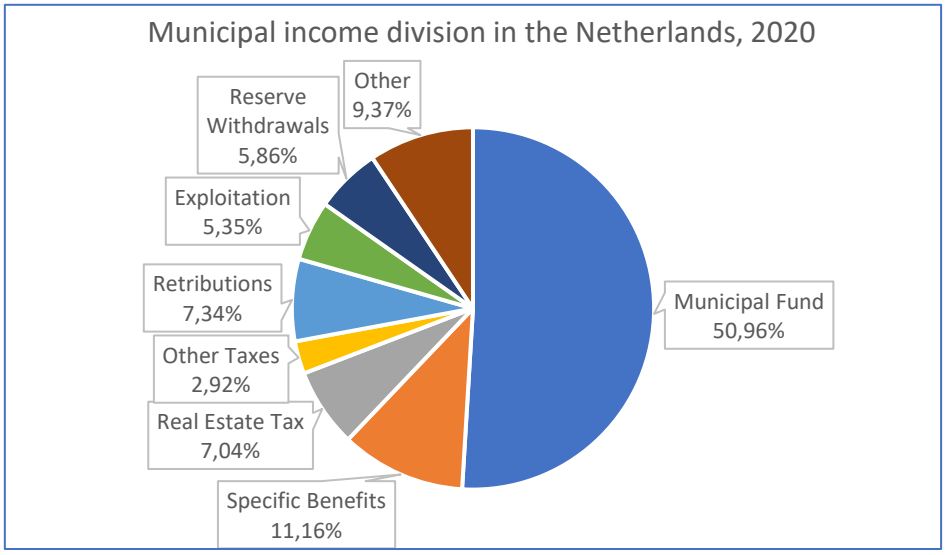

Figure 6: Municipal income streams in the Netherlands in 2020. Own chart. (Data: Ministerie van Financiën, 2022).

In addition, Dutch municipalities are not allowed to write new tax regulations for their own municipality. Extension of existing tax methods is not allowed, and limitations exist how high certain taxes may be (CPB, 2019). It can be concluded that the national government is responsible for most of the public financing for municipalities, both in a direct monetary way as in a legal way. Table 8 illustrates the framework which is created based on the income streams. It shows the source, freedom of spending and land-based finance methods respectively.

Income stream	Source	Freedom of spending	Land-based finance method
Municipal fund	Central government	High	No
Specific benefits	Central government	Low	No
Real estate tax	Local	High	Yes (Value capturing)
Other taxes	Local	High	No
Retributions	Local	None	No
Exploitation	Local	High	Yes (Value capturing + Land asset management)
Reserve withdrawals	Local	High	No
Other	Mixed	High	Partial (Land asset management)

Table 8: Overview of municipal income streams in the Netherlands.

Municipal income has many sources and many destinations. The focus in this research is urban development. However, the financing of urban development does not only happen with the aforementioned income streams. Developer obligations are not counted as income streams by the national government, as they are primarily seen as a cost recovery tool in the Netherlands. Paragraph 4.1.2 will further elaborate on developer obligations as a land-based finance method in the Dutch municipal context for urban development.

4.1.2 Developer obligations as a land-based finance method in the Netherlands

The previous paragraph has argued that Dutch municipalities are very dependent on the central government, and that local land-based finance methods generate a relatively small percentage of yearly income. However, an important land-based finance method is overlooked which does not comprise of income, but does contribute to developments in a municipality. According to Peterson (2008) developer exactions, also known as developer obligations, are a land-based finance method that shift the investment in local infrastructure towards the private sector instead of the public domain. In the Netherlands developer obligations are used as a method of *cost recovery* (Muñoz Gielen & van der Krabben, 2019). This means that costs that are made for constructing necessary infrastructure can be (partially) recuperated from private developers. Thus, this method differs from value capturing in the sense that there is no profit to be made when only recovering costs in a specific development.

Developer obligations are a rather new phenomenon for the Netherlands compared to other developed nations (Alterman, 2011). Traditional urban development relied on public land banking, enacted through active land policy. Value could be captured through the sale of public land which ensured financial contributions for public infrastructure. However, public land banking in the Netherlands has been declining since the 1990's (Alterman, 2011). Furthermore, three reasons surrounding the year 2008 amplified the abandonment of active land policy in the Netherlands (Hendricks et al., 2021). Firstly, the economic crisis led to municipalities losing money on existing building plots for housing and development. The crisis drove down consumer demand, which in turn led to developers pulling out of the market. This effect caused Dutch municipalities to be wary of widespread active land policy in the future. Secondly, a shift from greenfield development to brownfield development was noticeable, as the VINEX policy era (1995-2005) had already ended (Lörzing et al., 2006). A higher level of complexity, private landownership and risk make brownfield developments less favourable for active land policy. Thirdly, in 2008 the new Spatial Planning Act laid the legal groundwork for the application of developer obligations by Dutch municipalities (Hendricks et al., 2021). However, active land policy is still implemented in the Netherlands, but urban developments tend to be led by market actors that own the land, which stresses the need of developer obligations in order to finance on and off-site specific infrastructure which cannot be paid using the traditional land banking strategy (Sorel et al., 2014).

The rationale for developer obligations in the Netherlands

Now that the background surrounding developer obligations has been established, the innerworkings of the method in the Dutch context can be discussed. The first aspect to mention is the rationale behind the use of the method. A developer will profit from the value increases mentioned in paragraph 2.1.2, which can lead to questions about to whom the value increase belongs: the land owner or the community. Muñoz Gielen & Lenferink (2018) distinguish 'direct' and 'indirect' rationales, or schools of thought. The direct rationale is based on the premise that the value increase belongs to the community, and land-based finance methods using this rationale will distribute wealth in a form of taxation. The indirect rationale is based on internalising the social costs that a development brings with it. Developer obligations are an example of this, because a developer pays contributions towards the infrastructure surrounding the development (Muñoz Gielen & Lenferink, 2018). Within the Dutch legislative system, there are two main tracks for developer obligations that a municipality can follow: (1) public law and (2) private law. The upcoming paragraphs will elaborate on both of these tracks.

Public law

The 2008 Spatial Planning Act enabled municipalities to use developer obligations on a legal basis. Within this law, cost recovery can be done by a Development Contributions Plan (*exploitatieplan*). The contents of the Development Contribution Plan are bound by public law. The use of this method of developer obligations is therefore referred to as an N-NDO (Non-Negotiable Developer Obligation) (Muñoz Gielen & van der Krabben, 2019). Negotiation based on the costs or function of contributions have no impact since that is predetermined in N-NDOs. Predetermined sets of costs which can be charged through the Development Contributions Plan are found in article 6.2.3 up and until 6.2.5 in the 2008 Spatial Planning Decree. These types of costs can be divided into planning, on-site and off-site costs. Planning costs are municipal costs for plan development and facilitating costs. On-site costs are costs that are directly correlated with the development, and as long as they have been specified in the law they can be charged to developers. Examples are servicing the land, necessary infrastructure and green spaces (Wettenbank Overheid, 2021).

Through public law and N-NDOs, planning and on-site costs can be fully recovered by the municipality. Off-site costs are a different story, these are costs which are not directly linked with the development, for example large public infrastructure. Off-site costs can be divided into three different classes. (1) Infrastructure that serves multiple areas (larger roads, public transport, large amenities), (2) cost equalisation (off-site council housing) and (3) contributions to urban developments (climate adaptation projects, other urban developments) (Hendricks et al., 2021). Not all of these costs can be completely recovered in the N-NDO, and have some requires before they can be recovered. In order for a developer to pay his fair share the proportionality, causality and benefit of an off-site development has to be proven (*PPT criteria: Proportionaliteit, Profijt, Toerekenbaarheid*) (Muñoz Gielen, 2011). This severely limits the amount which an N-NDO can contribute to off-site infrastructure. In the N-NDO only the first two specified off-site costs are compulsory, contributions to urban developments are the exception as they are voluntary and do not fall under the proportionality, causality and benefit judgement. In addition, equalisation and contributions to urban developments require the municipality to have made a spatial vision document (*structuurvisie*) in which the off-site projects are mentioned descriptively. Furthermore, the N-NDO is held back by the capacity of the developer to pay his contributions based on the expected feasibility of the project. The literature calls this *macro capping* (*macro-aftopping* in Dutch) (Sorel et al., 2014), which means that the developer should not make a financial loss on his exploitation because of the developer obligations that have to be paid.

When the size of the N-NDO has been calculated, the municipality can start adjusting the land-use plan which is necessary in order to develop. The building permit that a developer needs to start construction can be held back by the municipality if the contributions are not paid in the N-NDO (Muñoz Gielen & van der Krabben, 2019). This mechanism ensures that contributions are paid by developers since costs are already made before the building process begins, such as: land acquisition, planning costs and administrative costs. Paying the contributions is the rational choice for a developer based on sunk costs. There is criticism against the use of the N-NDO strategy in the Netherlands. Next to hardly covering off-site infrastructure costs, the time which the public law track consumes is unfavourable for all parties involved (Hendricks et al., 2021). N-NDOs are labour-intensive, tedious and complicated. Therefore, developers have the fear that project delays will happen, which leads to less houses being built in the respective municipality in the short term. This is one of the reasons why N-NDOs are hardly used in the Netherlands, and an agreement based on private law is the preferred method by developers and municipality (Muñoz Gielen & van der Krabben, 2019).

Private law

The literature calls developer obligations in the private law track NDOs (Negotiable Developer Obligations) (Muñoz Gielen & van der Krabben, 2019). Instead of being rooted in the Development Contributions Plan, the contributions are stated in a Development Agreement (*anterieure overeenkomst*), a legal document which is the result of negotiations between the municipality and the developers on a voluntary basis. The Development Agreement contains the information about the contributions towards planning costs, on-site and off-site public infrastructure. Only after the initial agreement about the contents of the Development Agreement the land use plan will be amended, which indicates that the development can progress into the next phase. Legally, municipalities have no obligation to amend the land use plan after the negotiations have concluded (Muñoz Gielen & Tasan-Kok, 2010), amending the land use plan before negotiations are completed is legally allowed in the Netherlands. However, municipalities prefer waiting with amendments because of the strategic advantage they have when steering through land acquisition is no longer possible, especially when the developer already owns the land in a facilitating land policy scenario. The amendment of the land use plan is, thus, seen as the last move a municipality can make in order to have a certain amount of leverage on the developer. However, Dutch municipalities are not allowed to force developers to agree to the NDO on the premise that they will be denied development when it comes to amending the zoning plan (Muñoz Gielen & van der Krabben, 2019). If developers and municipality do not come to an agreement, the aforementioned N-NDO track will be followed making use of the Development Contributions Plan.

Another difference from the public law track is that voluntary negotiations do not depend on the notion of *macro-aftopping* as the definition in the public law track (Lucassen, 2020). The negotiations between municipality and developer lay the groundwork for estimating how far NDOs can go. It is up to the responsible negotiators to find a balance between contributions to the municipality and feasibility of the development.

Contrary to the public law track, the Developer Agreement allows for more contributions to be made by developers. The contributions are not set in stone, but are largely based off the public law track in the basis. Both the negotiating parties know that the minimum contributions will be recovered through the Development Contributions Plan, if necessary, but since that process is unfavourable, the Developer Agreement is preferred. The contributions in the NDO are thus negotiable, especially when it comes to off-site infrastructure, but a few factors play an important role within the negotiations: (1) relevant policy, (2) the economic incidence and (3) certainty of the NDO.

According to Hendricks et al. (2021) municipal policy surrounding NDOs can be confusing, unpredictable and incomprehensible for developers. However, having policy surrounding NDOs does improve the willingness of developers to pay for off-site infrastructure. But the quality of such policy can be questionable, which is unfavourable for negotiations. Dutch municipalities tend to be ill-equipped when handling complex policy surrounding NDOs, speculatively because this trend is relatively new in the Netherlands (Muñoz Gielen & Lenferink, 2018). In addition, public policy surrounding cost recovery tends to differ between municipalities, with varying degrees of mistakes when it comes to mentioning the correct legal terms for certain infrastructure. Confusion and unclear policy might lead to rougher negotiations down the line.

The economic incidence of the NDO and certainty also play an important role in the negotiations. This entails the moment in time at which the NDOs are prescribed by the municipality (Muñoz Gielen & van der Krabben, 2019). A distinction can be made between on-site and off-site infrastructure. On-site infrastructure is decided upon fairly late in the planning process, this is because after having

submit a building plan, the municipality has to calculate the consequences for other urban areas and infrastructure in the vicinity. Based off these calculations the NDOs are described. For off-site infrastructure, the contributions are dependent on the content of existing policy documents. Policy documents are not bound by law, but can describe certain contributions towards off-site infrastructure (Muñoz Gielen & Lenferink, 2018). This means that developers know of certain contributions relatively early in the planning process. As a consequence, their level of certainty of the contributions is quite high. If additional costs in the form of contributions are known beforehand, these might get internalised in the land price which the developers have to purchase in order to develop. As a result, land acquisition prices might decrease if certainty about contributions are high (Muñoz Gielen & Tasan-Kok, 2010). Having no policy, or less certainty regarding NDOs might possibly lead to friction within negotiations and relatively less contributions towards off-site infrastructure.

Contributions to off-site infrastructure are rarely excluded in the Development Agreement, but several scholars have expressed their worries about NDOs in the Netherlands, especially when it comes to the use of the method regarding the future. Muñoz Gielen and Rheinfeld (2016) imply that municipalities are currently only allowed to recover a small part of the off-site development costs, while over time all the small, separate developments will cumulate into the need for bigger off-site infrastructure projects in order to cope with urban growth. Additionally, the argument is made that *macro-aftopping* within N-NDOs will further limit cost recovery possibilities in the future, especially for brownfield transformations. Furthermore Muñoz Gielen & Lenferink (2018) mention that the ability of developer obligations to make up for losses on other financial methods is limited, but still debatable. However, they also mention that Dutch municipalities fear cancellation, delays or shortages when it comes to realising large public infrastructure in their territory due to diminishing resources.

Land-based finance framework for Dutch municipalities

Based on the information given about municipal finance in paragraph 4.1.1, and the rationale for developer obligations in the Netherlands in this paragraph, a framework has been established in table 9 which shows the scope of land-based finance methods primarily used in Dutch municipalities. This framework, together with table 8, show the main flows of municipal income both as a source from the central government, as from local sources - including land-based finance methods.

Table 9: Land-based finance framework for Dutch municipalities.

Land-based finance method*[1]	**Functionality**	**Type of method**	**Applicability in Dutch municipalities**
Real Estate Tax	Provide additional funds for municipal use	Value Capturing	Everywhere, based on public law
Exploitation	Cost recovery for infrastructure through public land banking.	Land Asset Management / Value Capturing	Optional – policy and asset dependent
Land Leasing / Land Rent	Provide additional funds for municipal use	Land Asset Management	Optional – policy and asset dependent
Non-Negotiable Developer Obligations	Cost recovery for on-site infrastructure. Off-site infrastructure costs can be recovered based on the *PPT criteria*.	Developer Obligations	Everywhere, based on public law in the Development Contributions Plan (*Exploitatieplan*)
Negotiable Developer Obligations	Cost recovery for on-site infrastructure. Negotiable contributions towards off-site infrastructure.	Developer Obligations	Everywhere, based on private law in the Developer Agreement (*Anterieure Overeenkomst*)

This framework can be related to the aforementioned public and private law track for developer obligations as a land-based finance method. The framework offers municipalities a basic cost recovery tool through the public law track. Its application is therefore clear, as everything is written in public law. However, the framework also offers cost recovery through private law, which grants municipalities more freedom for recovering costs in the developer agreement. Therefore, the framework in table 9 can be seen as a set of options, and it is the municipalities' choice which methods are applicable. The considerations that the three case study municipalities have for choosing methods in the framework will become clear in chapter 5.

To conclude, several financial aspects have been discussed in this chapter. The dependence of Dutch municipalities, in general, has been discussed and further supplemented with key information about their income from a national perspective. The dependency on local, and in particular land-based finance methods is relatively small for the tasks which they have compared to similar decentralised countries in the EU. The methods of income can be seen in *table 7* and *table 8*. In addition, the rationale for developer obligations and its importance for urban development, especially when it comes to on-site and off-site contributions have been discussed thoroughly. It can be concluded that this chapter has provided a solid base for the empirical research. The empirical research will further focus on the practical implementation of N-NDOs and NDOs in the three Dutch municipalities, as well as on the sustainability of this land-based finance method for sustainable urban development in the future.

***1** *The literature mentions several other optional land-based finance methods which Dutch municipalities could theoretically use. These are: (1) Business Investment Zones (Experimentenwet BI-zones), this method allows for higher property taxes in a certain area. The profits of the tax can be used to fund public infrastructure for that area. This method has not been applied often in the Netherlands* (*Muñoz Gielen & van der Krabben, 2019). (2) Betterment contributions (Baatbelasting) can be charged on landowners to charge the cost of on-site infrastructure. Due to its complexity and insufficiency this method is hardly used in the Netherlands (Sorel et al., 2014). Because of their limited applicability and relevance to this study, they will not be discussed any further.*

5. Results

This chapter presents the results of the semi-structured interviews from the three case study areas of Utrecht, Eindhoven and Maastricht. The results are presented in a structure similar to the conceptual research framework presented in paragraph 2.3. The presentation of the results is carried out in the following order: (1) sustainable urban development, (2) practical implementation of developer obligations, (3) land-based finance framework for Dutch municipalities, (4) influence by national government, (5) bargaining process, and lastly (6) policy process. The appendix contains additional background information about the three case study areas, specifically about their sustainable urban development challenges and vision, their ways of financing sustainable urban development, and an overview of municipal finances. This information can be found in the appendix, paragraph 8.4.

5.1 Sustainable urban development

As sustainable urban development is an important goal for municipalities, as well as a dependent variable in this research, this paragraph will analyse what the biggest challenges are when it comes to sustainable urban development in Utrecht, Eindhoven and Maastricht. Each municipality has a unique context and a different outlook on the respective issues. At the end of this paragraph, the reader will be informed about the main challenges, considerations and other variables that play an important role in sustainable urban development in the three municipalities.

5.1.1 Utrecht

The interviewees from Utrecht mention that sustainable urban development can have multiple meanings. On one hand, they mention making urban development sustainable when it comes to energy use and generation. Other interviewees mention sustainable development as a term for 'growing the city in a sustainable way' – meaning that urban growth should happen with methods which are reliable, repeatable and successful for Utrecht in the long term.

The main challenges that come with making sure that individual developments are sustainable lie within the considerations for the purpose and target group of a housing development. The Merwede is a large development of 6000 homes, and mostly consists of energy neutral developments targeted at people that do not use a car regularly: "*Suppose you assume a VINEX layout, where each house has 1 or 2 cars, and they go up the Europalaan and the A12 every morning, then it will all be jammed*" (Utrecht, #1). However, solving this issue partly requires car parking facilities to be moved underground, with ample electric chargers. This is a large investment: "*you may have to do something extra and it will be more expensive, that is continuous customisation*" (Utrecht, #1). The initial investment costs extra, but the plans will have a lower impact on the existing infrastructure of Utrecht. Smart city planning leads to less pressure on off-site infrastructure in Utrecht. However, it is difficult for the municipality to decide when off-site infrastructure is needed: "*You never know exactly what effect initiatives will have on those off-site facilities and when it will be the last straw*" (Utrecht, #2). This is mostly a problem for parts of Utrecht that have many small developments, which amount to a considerable figure combined. Utrecht South-West and Kanaleneiland have this issue: "*There are a lot of small initiatives that add up to two thousand homes, so you know: well, there will have to be investment in public space. (...) But there is always a time lag, so to speak*" (Utrecht, #2). The time lag indicates that not all developments are phased equally, which means that the pressure on the public space is hard to estimate compared to one big development. This is negative for developing sustainably for the city as a whole, because it is hard to determine when specific off-site infrastructure is needed.

The interviewees mentioned one major influential factor on sustainable urban development: economic development. Micro- and macroeconomic changes influence urban growth and the degree to which this happens at a sustainable level, both on a city-wide scale and a single-development scale. The interviewees mentioned that the economic climate in the past couple of years has been very positive, but that the current economic developments are worrying. "*Construction costs are currently skyrocketing, but of course revenues have also risen significantly in recent years*" (Utrecht, #1). The rise in building costs threatens the business case of some developers in Utrecht, especially if the housing prices stagnate simultaneously: "*Well, suppose there is a ceiling on the rise of the housing prices and the building costs continue to rise, then you have a different business case. Also, fewer opportunities to recover costs*" (Utrecht, #1). The consequence of this is that it will be harder to negotiate 'in the margin' for off-site contributions. And because Utrecht is reliant on DO for their

future development plans (Gemeente Utrecht, 2021b), this could potentially hamper sustainable urban development due to a lack of funding.

However, the interviewees mention a connection between the economic climate and the need for off-site infrastructure investments. If the economy falls into a recession and the business cases for housing developers are not feasible, the city will stop growing. This will lower the demand for new off-site infrastructure investments based on a lack of growth. But it also has negative consequences for off-site infrastructure that Utrecht still needed to realise in order to catch up with previous growth. DO will stop being a sizeable contribution if the business case is not feasible. This refers to the concept of *macro capping*, and that the feasibility of the business case is leading for development, as well as for DO. The interviewees worry when it comes to Utrecht's ambitions in this economic climate: "*Yes, but I do see that with rising construction costs, more and more projects are coming under pressure, so I think that our production, in particular, will soon be in decline, because if there is no feasible project left, it will simply grind to a halt*" (Utrecht, #4). The fear exists that rising costs, alongside with stagnation in house prices will lead to slower development. But this is not only true for housing, but also for the construction of sustainable energy landscapes, green infrastructure and social infrastructure. This could threaten Utrecht's sustainable development ambition.

The interviewees mentioned variables that have a negative impact on sustainable urban development in Utrecht. Variables related to the speed of realising a project are related to financial stress, a lack of funding, or a struggling business case. Additionally, interventions from participating citizens create frustrations with some public officers, further delaying the process. Also, the complexity of inner-city development can cause delays, as well as financial stress due to large necessary investments. Positive variables were not significantly named by the interviewees.

5.1.2 Eindhoven

The public officers in Eindhoven were more focused on city-wide sustainable urban development, instead of project-specific sustainability. The interviewees mentioned that the main challenge is to find a balance between Eindhoven's ambitions, and the affordability of sustainable urban development for the municipality and the developers. The city already copes with challenges in the spatial domain: "*Actually, as a city we are already quite full. So, with everything you add now, something has to be done in the public area or in infrastructure, in the environment or greenery, all off-site facilities*" (Eindhoven, #3). According to the interviewees, sustainable development means that the city can facilitate the needs for growth and realise the ambitions that Eindhoven has. The interviewees realise Eindhoven has an important role in the regional and national economy – also known as the Brainport: "*But Eindhoven is in that respect simply an enormously ambitious city. Fifth city of the Netherlands, mainport, that requires quite some investments in the city, so to speak*" (Eindhoven, #1). It is made clear that there are significant investments needed in order to realise the municipal ambitions. Eindhoven's ambitions are further discussed in appendix 8.4.

However, in order to develop sustainably in the next couple of decades, Eindhoven needs structural funds. But according to interviewee #1, those funds are not available: "*The problem of not having structural money is that you cannot make extra costs structurally. You can't hire a hundred extra civil servants, because that would mean a structural burden on your budget; there's no room for that*" (Eindhoven, #1). The lack of structural funds has negative consequences for sustainable urban development in Eindhoven. But this does not mean the municipality is performing bad financially: "*Meanwhile, we see that in recent years there have been real surpluses, so to speak, in the annual accounts, but that is all incidental money, so it does not translate into long-term structural money*" (Eindhoven, #1). Incidental money, such as surpluses from land exploitation cannot be used to fund

yearly investments, because there is no certainty that incidental profit occurs again. Despite of this, the public officers are not very worried about Eindhoven's financial situation, mostly due to their pragmatic style of investing: "*In the case of Eindhoven, however, we only decide to spend the money when it is actually received*" (Eindhoven, #1). This statement is in line with the desk research in appendix 8.4, which indicated that Eindhoven has the lowest debt-to-equity ratio of the three researched municipalities, and is the healthiest when it comes to overall municipal finance (Jongsma et al., 2022).

The interviewees are not worried about Eindhoven's financial situation, but they fear that developers might soon get into financial trouble due to recent economic developments: "*At the moment, there is just a lot of uncertainty in the market, which is felt especially strongly by developers*" (Eindhoven, #2). The uncertainty stems from rising building costs, inflation, the labour shortage and the supply chain issue. Taking those factors into account, the public officers mention that there is a large possibility that developments will be delayed, put on hold, or even cancelled. And as a consequence of the smaller profit margins, less contributions towards necessary off-site infrastructure can be made. Thus, the economic developments influence the business case, which in turn influence the potential DO a municipality can ask. Less DO means that the financing of off-site infrastructure will be harder. However, similarly to Utrecht, the public officers mentioned that there is a connection between the need for off-site infrastructure, demographic growth and the economy: "*Then there will be almost no new projects, and you will need far fewer off-site facilities, because the city will not be expanding as much. The pressure on the surrounding area is now mostly coming from new projects*" (Eindhoven, #3).

Next to economic developments being potentially negative for sustainable urban development, the public officers mentioned that the transition to a sustainable city requires up-front investments. The energy transition requires investments in the electricity network, and the municipality is expected to pay the costs up-front if they want to promote change: "*Yes, it still has to be implemented and that, of course, requires a pre-investment*" (Eindhoven, #2). But the funds do not allow for large-scale, up-front investments. Next to that, the municipality does not have the capacity for it either: "*There is simply not enough funding to tackle the entire investment task in one fell swoop, apart from the fact that the civil service does not have the capacity to do this*" (Eindhoven, #1). Lastly, sustainable housing developments have the tendency to be expensive, possibly pricing out people with a lower income – which is counteractive with municipal policy on affordable housing. However, one positive note is that developers have been more inclined to cooperate: "*And now you see more and more attention for the environment, for sustainability, climate, health. And also, for the housing programme*" (Eindhoven, #2). But the interviewee also mentioned that this has been made possible by the increase in housing prices in the last couple of years. If the economy falls into a recession, the developers with smaller margins will have difficulties in realising these policy goals – another negative influence for Eindhoven's sustainable development goals.

5.1.3 Maastricht

The interviewees from Maastricht emphasised that sustainable urban development has multiple scale levels, and that city-wide challenges and project-based challenges overlap and complement each other.

City-wide sustainable urban development goals are broad: "*So the energy transition, climate change, mobility, nature development, biodiversity, the widening of the river Meuse, which in our case is an enormous task*" (Maastricht, #1). Maastricht intends to develop in brownfield, inner-city areas. For sustainable urban development this means that the process is more complex. A public officer had the following to say about the relative size of Maastricht's challenges compared to Eindhoven and Utrecht: "*But our other tasks don't differ that much, do they? Maybe in size, because Maastricht is a bit smaller, but in relativity we have to do the same*" (Maastricht, #4). Another interviewee responded to this statement, adding the following: "*Well, perhaps we have a bigger task than some cities, because we are a very old city, a monumental city of course, so the interventions in the public space are often more complicated. So perhaps our task is even greater in that respect"* (Maastricht, #3). The inner-city context makes it more difficult to realise Maastricht's ambitions.

The interviewees from Maastricht also focused on specific examples of struggles regarding sustainable urban development. Interviewee #5 mentioned that Maastricht is currently in the process of restructuring post-war neighbourhoods. The construction of new facilities, as well as small off-site infrastructure is also included in the restructuration. One major investment area is education; the municipality wants to create 18 new primary schools that are future-proof and sustainable. "*Because with these new schools, there are also all kinds of new ambitions regarding sustainability, energy, energy-neutral buildings, fresh schools, etc*" (Maastricht, #5). However, the current economic climate makes it very difficult to realise the schools: "*The tenders we do, the ink is not yet dry on the first calculation, or it is already out of date. So, the increases in energy, in raw materials, the lack of personnel, that leads to an ever-increasing problem also in the feasibility of projects*" (Maastricht, #5). Just like in Eindhoven and Utrecht, a connection is visible between fluctuations in the market and the possibility of successfully realising sustainable urban development. And to make matters worse, the smaller margin in Maastricht's market structure leads to a less profitable business case for developers. Currently, the economic trends have pushed developers to their limit: "*Developers really put projects on hold*" (Maastricht, #2).

Furthermore, the interviewees mentioned additional factors that have a negative impact on Maastricht's ability to develop sustainably. The first one is uncertainty. Maastricht has a limited budget, and does not have the urban growth that is necessary to recover many costs. But in order to kickstart transitions such as the energy transition, Maastricht is expected to contribute significantly. Maastricht actively wants to invest, but the uncertainty about prospective technological developments is worrying: "*there is a lot of uncertainty, if we knew now that the whole energy transition would be in electricity, then you have a huge task in your electricity network to go, whereas if we knew now that there would be a large-scale deployment of hydrogen, for example, then the investment becomes very different"* (Maastricht, #4). The municipality can only spend their money once, and is hesitant to spend it wrongly or inefficiently. Secondly, Maastricht is unable to prioritise the spatial domain over other policy domains, mainly due to a shortage of available funds. The political context also plays an important role in this issue. Most spatial goals are set in the far future, such as 2040 or 2050. Social issues are important in the moment itself, and gain more political traction: "*And you see the balance of expenditures moving from the physical sphere to the social sphere, that is because the physical tasks generally have a longer horizon*" (Maastricht, #4). This is problematic because delays lead to higher costs in the future: "*We have to solve high river water by*

2050, but it will cost 330 million. And the later you start, the bigger the issue is going to be" (Maastricht, #4).

However, there are also factors that help the municipality to develop sustainably. The current energy crisis has highlighted the importance of energy neutral housing and real estate. The municipality owns real estate that is used by third parties, the users of the building can contribute to the costs of making the building sustainable. In the past, this programme was not used commonly. "*But you notice now, with the exploding energy costs, that the interest is coming back quickly, so that it is worthwhile to make this kind of investment*" (Maastricht, #4). The recent economic developments, especially when it comes to energy prices, have had substantial effects on individual projects. The interviewees hope that this trend will continue. But one interviewee is more negative: "*the energy transition, we want to widen the Meuse, we want to strengthen biodiversity, and we want to bring about a mobility transition, yes, we are not going to achieve that in the next twenty or thirty years with just the municipality of Maastricht*" (Maastricht, #1). The interviewee calls for cooperation on policy ambitions to make Maastricht more sustainable, as Maastricht alone cannot induce, facilitate and realise this transition on its own.

5.1.4 Comparison

The three municipalities have showed that 'sustainable urban development' has multiple meanings. For Eindhoven, it primarily meant that the city can facilitate growth in a sustainable way. Utrecht and Maastricht share this view, but also focus on individual projects.

It has become clear that all three municipalities require major investments in existing and upcoming infrastructure. Not only to cope with rapid urban growth, but also to make up for the missed investments in the past decade. Next to that, additional up-front investments are deemed necessary in order to induce transitions related to sustainability, such as the energy transition. Municipalities feel responsible, but often lack the funds and capacity to realise this.

All three municipalities referred to the current economic climate, and how the labour shortage, inflation, rising energy prices and rising building costs actively harm the realisation of developments and their business cases. The public officers strongly expect this to have a negative effect on the sustainable urban development goals of the municipalities, as well as potential DO. Furthermore, a connection has been found between economic developments, a developer's business case and the use of DO for sustainable urban development. If the business case becomes less feasible due to economic reasons, the potential for DO shrinks, which can hamper its use for additional off-site infrastructure or other sustainable development goals. Municipalities that count on this method of financing will potentially be in trouble, such as Utrecht and Eindhoven. Maastricht does not count on DO for off-site infrastructure, because the potential benefit does not outweigh the negatives, hence Maastricht will not feel an impact when it comes to DO losses.

5.2 Practical implementation of developer obligations

This paragraph illustrates how developer obligations (DO) are implemented in practice in the case study areas. This paragraph strongly focusses on the considerations that municipalities have when implementing DO, as well as their role and importance for on- and off-site financing.

5.2.1 Utrecht

The distinction between using DO for planning costs, on-site costs and off-site costs is immediately made by all interviewees. Planning costs can be defined as operating costs the municipality has to make when planning new developments in collaboration with private parties. In Utrecht, these planning costs are recovered every time. "*The basic principle is that we simply recover 100% of those costs*" (Utrecht, #5). On-site costs are also recovered by the municipality: "*Any interventions in the public space that have to be made as a result of that initiative must be paid for one hundred per cent by the initiator*" (Utrecht, #2). According to the literature, planning costs and on-site costs can be recovered through law (Muñoz Gielen & van der Krabben, 2019). Thus, this level of DO implementation was expected. However, DO implementation gets complex when dealing with off-site infrastructure in Utrecht. Off-site contributions are not as clear-cut as planning costs and on-site costs: "*It is very difficult to estimate what exactly the impact of that initiative will be on facilities in the city and what you should contribute"* (Utrecht, #1). In order to garnish contributions for off-site infrastructure, the municipality has to indicate what the impact of the development is on the existing infrastructure. In practice, this is difficult for the municipality: "*Off-site infrastructure are also largely of use to the rest of the existing city, from such a development. So, you can only recover a small part*" (Utrecht, #2). It is difficult to know when new off-site infrastructure is needed, and how much can be ascribed to existing urban structures. The public officers struggle with this concept when implementing DO: "*What is reasonable? (…). You always look for some sort of rationale or legitimisation of your arguments, but it is often a difficult one"* (Utrecht, #3). Off-site costs are definitely the trickiest type of DO to implement. But the need for contributions for off-site infrastructure is high, therefore the municipality sees the necessity of DO implementation, it is not seen as a small add-on: "*In this case, it is a substantial amount of money*" (Utrecht, #2). However, it must be mentioned that the DO contribution on its own is not enough to fund the entire demand for off-site infrastructure in Utrecht. The contributions will be mixed with available funds from the municipality. This was also mentioned in paragraph 4.2.1.

Most interviewees mention that Utrecht is currently working on an off-site infrastructure fund. Such a fund, grounded in policy, will bundle contributions and allocate them where necessary. An off-site fund will make it easier for the public officers to explain their reasoning and rationale, especially when it is grounded in municipal policy: "*In this way, you create clarity for developers, so that, in my opinion, there will be less discussion about such points later on*" (Utrecht, #4). However, the fund is still in early development. Currently, the off-site contributions require negotiations and careful consideration by public officers. The interviewees mention that cost recovery is an integral consideration of multiple factors. Often, the balance between getting a project developer to realise policy goals is negatively correlated with getting higher off-site contributions. Interviewee #4 mentions that Utrecht's many ambitions can clash with cost recovery for off-site infrastructure. The pile of ambitions for new housing developments lead to a smaller margin for potential contributions: "*At a certain point you soon reach a kind of maximum of what is still feasible in the market and what you can still ask for in the way of compensation for extra costs"* (Utrecht, #4). Finding the balance between municipal ambitions and cost recovery for additional off-site infrastructure is key. However, it has become clear that the public officers do not want to maximize the financial contribution, but

would rather find an equilibrium between financial compensation and the realisation of different ambitions. *"It's about the total. Not just the number you manage to agree on, but actually the total set of ambitions"* (Utrecht, #1) and "*Yes, sometimes negotiations are disappointing, say financially, but then everything is achieved in terms of content. yes, that is also important"* (Utrecht, #5). Public officers in Utrecht care more about realising ambitions in development projects than recovering more costs for off-site contributions. Instead of the maximum amount of recoverable costs, they strive for the optimal amount. This goes against the report by Stec Groep (2021), whom mention that municipalities do not ask anything in return for not recovering 'maximal' costs.

Not every development contributes to off-site infrastructure costs. Large developments contribute in almost every case, when it is possible and applicable. But smaller developments do not contribute to off-site costs in Utrecht: *"Utrecht uses it mainly for larger developments. For the smaller ones, they contribute nothing or very little to off-site infrastructure"* (Utrecht, #4). Small developments range from 1 to 10 residential units, and are mostly initiatives from private citizens instead of large firms. Because of the scale of small developments, they are accepted through a permit, which does not provide the opportunity for cost recovery for off-site infrastructure (Utrecht, #5). Another reason why smaller developments are not contributing to off-site infrastructure is the lack of municipal capacity to conduct cost recovery negotiations for every small development at the same time. The following quote illustrates this: "*For each individual small project, you actually have to make a complete calculation of which facilities will benefit? And that is also a lot of work per project*" (Utrecht, #5). The upcoming fund for off-site contributions will make recovering costs easier, also for smaller projects, especially if there is a fixed contribution. This will prevent small developments from not contributing to off-site developments in the near future (Utrecht, #4 & #5).

5.2.2 Eindhoven

Similar to Utrecht, planning costs, on-site costs and off-site contributions are relevant in Eindhoven when it comes to urban development. Planning costs and on-site costs are generally recovered in Eindhoven. The interviewees mention that they keep to the possibilities of the law: *"We are obligated to recover costs anyway (…), you have to recover all the costs related to the plan itself, and I am convinced that we have a good overview of all these costs and that we recover them well"* (Eindhoven, #3). However, the interviewees also mention that the recovery of planning costs is sometimes harder in practice. Interviewee #1 states that planning costs are completely recovered in 90% of the cases, and that there are always cases that cause more planning costs, mostly in the form of research costs. Interviewee #3 states that planning costs are nationally determined in the *plankostenscan* (a document that provides an indication of planning costs), but that estimating planning costs is not always an easy process for public officials: "*we have to get external experts for that, but it would be nice if we had the time for it as well, or some kind of method that we all do the same way*" (Eindhoven, #3). Planning costs are thus a point of discussion in Eindhoven, but mostly get recovered completely because they are mentioned in law.

Eindhoven stands out because they already have implemented a fund for off-site contributions meant for large public infrastructure developments. Every interviewee mentioned this aspect of DO, and was knowledgeable about its content and what considerations have led to the creation of the fund. "*Eindhoven is facing enormous growth. In order to be able to continue to facilitate all these spatial developments in the city, we also need to adapt all kinds of facilities in the city*" (Eindhoven, #1). The creation of the fund is directly linked to demographic and urban growth. The method of installing a fund for off-site infrastructure works with a fixed contribution per newly built surface

area in square meters. In Eindhoven, the fixed contribution is 42 euros per square meters for housing. However, there are underlying considerations for this exact number.

Eindhoven's growth comes with many challenges, but for DO the main challenge is to calculate how much a fixed contribution should be. Fellenoord, an area in Eindhoven, requires many off-site investments: "*There are a lot of costs that have to be made, because the Fellenoord, the main traffic artery, has to be moved. In fact, a bus station also has to be built there; these are all off-site facilities"* (Eindhoven, #2). The public officers came to the conclusion that the investments needed for all local off-site infrastructure would be too high for developers, and would be estimated at around 100 euros per added square meter. The municipality was afraid that charging such a cost would be unmanageable for developers: "*And you have to keep it manageable, don't you think? You have to offer certainty to developers as well, because that development has to take place. That's a bit of a balancing act every time*" (Eindhoven, #2). Keeping this in mind, the case can be made that Eindhoven would rather strive for optimal cost recovery, instead of maximizing developer's financial contributions. Additionally, charging a contribution which is too high might lead to less interest from developers, which does not line up with Eindhoven's ambitions of economic and urban growth.

The interviewees also mention that the fixed contribution leads to certainty about getting funds from developers, no matter how big or small the development area is. "*We really have a method for that, where we really determine and calculate the same way for all developers, whether you make one house or thousands, and that works very well"* (Eindhoven, #3). However, implementing an off-site infrastructure fund does not mean that there is no discussion about the carrying capacity of the existing city. According to interviewee #1, that discussion is lively within the municipality as well. New urban developments in Eindhoven only make up a relatively small percentage of urban space compared to the existing city. But the need for investments continues to grow. The interviewees have different opinions about the actual importance of DO compared to the investment task. "*My impression is that Eindhoven has a really big investment challenge and that the contribution we are making to it from the developers is marginal. It's about a lot of money, it's about millions. But the urban task is a multiple of that"* (Eindhoven, #1). The interviewees stress the fact that developer contributions are designed as an extra method of funding, but that the brunt of the investment has to come from other methods. This does not mean that DO are unnecessary. "*I would say that it certainly plays a very big role*" (Eindhoven, #3).

In general, the implementation of DO for off-site contributions is going well. "*I haven't heard anywhere in practice were it's not recovered, so yeah, I'm actually happy about that"* (Eindhoven, #3). It seems that enacting a fund into municipal policy ensures that contributions are being made, and that the public officers have a clear view about its practical implementation. But still, the considerations for not maximizing the off-site contribution indicate that the realisation of policy goals is valuable to the municipality as well.

5.2.3 Maastricht

Maastricht has complex issues regarding cost recovery when it comes to planning costs. Planning costs cannot be recovered in their entirety in 100% of the cases: "*But in almost all plans, and at the moment without exception, all plans, we just come up short"* (Maastricht, #4). The reason for this is that the *plankostenscan* is not suitable for the type of developments that Maastricht works with. In practice, Maastricht only realises brownfield, inner-city projects. The consequence is that the planning process takes longer, and is more complex. For the *plankostenscan* this means that the amount is skewed, and the legal maximum amount of recoverable planning costs is lower than the

actual costs in Maastricht: "*Our experience, our practice, shows that we often don't work out with the planning costs regulation. In other words, there is often more official time involved than the regulations allow us to spend. And the costs are often left with the municipality*" (Maastricht, #5). Negotiating the extra amount for planning costs is labour intensive and hard to explain to private parties. "*And the rest of the costs you have to try to arrange in another way, if you want to arrange that. You automatically run into that with larger plans*" (Maastricht, #4). The implementation of DO for planning costs is problematic in Maastricht, but it is expected to get worse in the near future. The new Environment and Planning Act (*Omgevingswet*) wants to boost civil participation in development projects. According to interviewee #5, this new legislation will strain cost recovery even further in Maastricht: *"If the cost recovery process stays the same, with the current planning costs arrangement, our assessment is that we are going to have an increasingly difficult financial time. We are going to have more and more problems*" (Maastricht, #5).

The interviewees mention that on-site costs are more easily recovered in Maastricht. Maastricht keeps to the law, and tries to recover exactly what is needed: "*We do this through the agreement of intent, followed by an anterior agreement with legally required cost recovery*" (Maastricht, #5). This indicates that on-site costs are recovered well. Also, there are no incidents where interviewees mention that there are problems with recovering on-site costs.

However, off-site costs were mentioned as being a problematic factor in Maastricht. Maastricht does not implement DO for off-site infrastructure: "*At this time, we do not have a regime for offsetting off-site costs*" (Maastricht, #4). It is not a coincidence that off-site costs are not recovered in Maastricht; it is a purposely made decision based on the context of Maastricht. The first reason why off-site DO are not implemented is that the current urban developments in Maastricht are not profitable enough in order to ask for a substantial off-site contribution: "*We see that there are mainly housing programs in the segments with little earning potential. (…) But the segments that make money, like the free sector, that's what we're not going to realize as a city in any substantial way over the next few years*" (Maastricht, #5). The margins are too small to ask for a sizeable contribution. The public officers have spoken out their worries about developers not being able to realise affordable housing when confronted with off-site contributions, some interviewees even call it a tax. The second reason is that potential contributions are insignificant compared to the investments that have to be carried out in Maastricht. Interviewee #3 commented on the role of off-size contributions in the larger scheme of investments: "*it's really just a drop in the bucket*" (Maastricht, #3). Furthermore, the interviewees commented on the fact that Maastricht does not have a fast-growing population, and stagnation will happen in the near future. As a consequence, less DO can be gathered – because there is simply less housing being developed. Lastly, realising brownfield projects means that the margins of developments are smaller, because inner-city development requires significantly more investments compared to greenfield developments on the edge of the city (Maastricht, #4). However, the public officers did note that the council has initiated research into potential off-site contributions in the future.

It is clear that Maastricht does practice cost recovery for planning and on-site costs, but does not charge off-site contributions. This does not stem from ineptitude, but from reasoning and considerations: "*We think it's more important that a certain goal is taken care of, for example affordability, urban greening or sustainability. (…) We find that more important than just looking at whether you come out on top financially*" (Maastricht, #4). The interviewees have made it obvious that Maastricht is not suited for widespread off-site contributions. The context and ambitions of the city currently do not match up with this method of financing.

5.2.4 Comparison

All three municipalities use DO as a cost recovery method for planning costs and on-site costs, but the degree to which this is successful differs. Utrecht has no noticeable problems with planning costs, while Eindhoven has slight issues in some cases. Maastricht is the weakest performer, with large differences between estimated costs and actual costs. Although some factors, such as inner-city developments and complex ownership structures, are out of their own influence. The interviewees call for improvement of the *plankostenscan* in order to make up those losses.

No municipality has shown troubles in implementing DO when it comes to on-site costs. These costs are grounded in legislation and are clear to the developer, which could be reasons why this is unproblematic in the selected municipalities.

Implementation of DO for off-site infrastructure shows drastic differences between the municipalities. Eindhoven has a fixed fund which is reliable and transparent, while Utrecht has to negotiate off-site contributions per individual development. As a result, Eindhoven is more consistent with garnishing contributions, as Utrecht does not negotiate contributions from smaller developments. But DO for off-site infrastructure play a significant role in Eindhoven and Utrecht. In Maastricht the role of off-site DO is small, or non-existent. Maastricht shows no implementation of DO for off-site infrastructure, due to a multitude of context-specific reasons.

However, all three municipalities have provided considerations for DO. When analysing specific considerations for off-site DO, the concept of urban growth plays an important role. More demand for infrastructure will happen when demographic and urban growth occur. This plays a role in Eindhoven's and Utrecht's interest in DO for off-site infrastructure, as they are rapidly growing and have corresponding ambitions. Maastricht's population is close to stagnating, which has an influence on the viability of the DO method. Peterson (2008) mentions that land-based finance methods, in general, are more successful in rapidly growing urban areas. The empirical findings in this paragraph support that claim. Lastly, all three municipalities would rather strike a balance between the realisation of municipal ambitions and financial gain for off-site infrastructure. They strive for optimal cost recovery instead of maximal cost recovery. This can be a reason why municipalities do not capture all available value when implementing DO. This would indicate that there is still leeway in cost recovery, in case the municipalities decide to strive for less policy ambitions.

5.3 Land-based finance framework for Dutch municipalities

This paragraph looks at how the land-based finance framework for Dutch municipalities is utilised for sustainable urban development, and how it affects the practical use of DO in the three case study areas. Specifically, this paragraph will touch upon its application, sufficiency and potential needs for improvements. Next to that, the broader scope of municipal finances is taken into account for this paragraph as well, as land-based finance methods are not the only source of municipal income. The land-based finance framework for Dutch municipalities is illustrated in *table 4*, paragraph 4.1.2. A detailed overview of municipal finances for the three municipalities is found in figures 13, 14 and 15 in appendix 8.4.

5.3.1 Utrecht

Land-based finance (LBF) methods have many sources and uses. Utrecht has the means and the intention to still utilise active land policy in some areas. This generates income that can be used to recover costs and contribute towards policy goals. Utrecht has a healthy mix between loss-making and profitable projects: "*I think it is a healthy mix. Look at all the land operations that are being settled in the land exploitation reserve, I think it shows a positive picture over the long term*" (Utrecht, #2). This goes against the literature review, as Stauttener & Boelman (2021) claimed that area developments are almost exclusively loss-makers for municipalities. Some interviewees mention that the municipality wants to become more active on the land market again. In practice they notice that land ownership can be influential for realising certain policy goals, especially goals that do not line up with developer intentions. Another interviewee (#4) says that active land policy is important, but also risky because of its dependence on market factors. However, Utrecht has been largely moving towards facilitating land policy, which highlights cost recovery through DO. The implementation of DO has already been discussed in the previous paragraph, and also shows that DO implementation is based on the business case, which is partially determined by the market. Both forms of LBF are dependent on the economy and market factors.

In the majority of projects Utrecht works with facilitating land policy and DO. The question can be asked how sustainable the DO method is when looking at short and long term sustainable urban development. For the short term, the interviewees mentioned that DO can be volatile: "*Yes, and you will have years when a little less comes in and you will have years when a little more comes in. Just like one project will yield more than another. So yes, in the short term it is certainly not stable*" (Utrecht, #5). Because DO are incidental instead of structural, the short-term yield is unpredictable. Therefore, it is dependent on what specific policy goals should require DO. According to interviewee #4, DO should not be used for the core goals of a municipality: "*There's also a difference in that per policy objective. Look, as a municipality your most important goal is to be clean, whole and safe. That's actually the most important thing for a municipality and the rest are plusses, so to speak*" (Utrecht, #4). The core goals of the municipality should be financed by structural funds, such as contributions from municipality fund, local real estate tax and additional levees: "*So if you grow, you get more real estate, which means more property tax (OZB). You get more inhabitants, which means more payments from the municipal fund*" (…) "*The off-site DO is indeed a one-off contribution (…) it must be used for incidental costs*" (Utrecht, #5). The LBF method of DO is used for incidental expenditures, while other LBF methods such as taxes are used to finance urban growth. But DO plays an important role for Utrecht to adjust to urban growth through off-site infrastructure in the long term. The interviewees expect DO to adjust to economic developments, and it will balance out if the timeframe is long enough: "*So yes, in the short term it is certainly not stable. But in the long term I expect DO to stay*" (Utrecht, #5). But the reliance on DO for timely investments in off-site infrastructure is portrayed as frail, especially in an uncertain economy.

The interviewees unanimously agreed with the notion that those who profit, should contribute to the city. The rationale for implementing DO is prevalent in Utrecht. The interviewees see no reason why DO should be abandoned: "*I think it is a reasonable idea that the market, and those who benefit from it, should pay. The only question is, is it the right system to renegotiate every project?*" (Utrecht, #3). Although the interviewees support the use of DO for sustainable urban development, it has been made clear that there are also doubts and downsides to this method. "*To a certain extent, I think that the largest projects must contribute. But sometimes a smaller project requires a large investment, and I think that's where the friction is*" (Utrecht, #4).

In order to bridge the financial gap for off-site costs, some interviewees mentioned alternatives and improvements for the LBF framework. The wider application of taxes was discussed, but gets struck down because of a lack of political support and lack of taxable resources: "*There are few municipal taxes that we can raise substantially to generate more revenue*" (Utrecht, #5).

5.3.2 Eindhoven

Eindhoven also makes use of active land policy, but far less compared to Utrecht. The days that public land banking made the municipality a lot of money are in the past, according to interviewee #1. Public land banking, and using this method to finance policy ambitions is inherently risky: "*We have also seen that this can involve considerable risks, resulting in write-offs and financial consequences*" (Eindhoven, #1). The interviewee adds that a municipality with the intention to profit off of land is playing with taxpayer money. And in the event that the municipality loses money, the citizens will have to foot the bill. This argument is used by multiple interviewees in Eindhoven, indicating that major activity on the land market is unwanted. Instead, Eindhoven focuses on facilitating land policy with their signature off-site DO fund which has already been discussed in the previous paragraph. Using DO, the risk for the municipality is perceivably smaller compared to public land banking.

Similar to Utrecht, DO implementation and land sales are incidental incomes. Structural funds are lacking in Eindhoven, as mentioned in paragraph 5.1.2. "*And you need structural money to continue to accommodate that growth*" (Eindhoven, #2). Eindhoven's ambition for growth comes with a downside. The ambitions of Eindhoven ensure that the city is preparing itself to become a city with 300.000+ inhabitants, but the necessary funds to accommodate urban growth are not present: "*our area management resources do not increase when we develop something new. And yes, at a certain point you have developed so much new stuff that you also have to make adjustments*" (Eindhoven, #2). The funds needed to maintain new urban areas do not increase relative to new developments in Eindhoven. Interviewee #2 mentions the reason for this: "*This happens in Eindhoven, because for a number of years we were struggling financially. Then those resources were frozen, and then at a certain point you notice that*". Eindhoven's past situation still influences the municipalities' ability to maintain their urban structures.

The interviews also mention a discrepancy between Eindhoven's ambition and the current situation. Currently, Eindhoven has the income relative to a 230.000 inhabitant city, alongside with fitting amenities and facilities. The goal to become a 300.000+ inhabitant city requires investments the municipality cannot make with their current financial framework. Additional income from DO and the national government is required. Thus, the interviewees mention that for Eindhoven's ambitions, the current framework is insufficient. This is partly because of the negligible room for additional taxes in the current system: "*It simply requires a great deal of investments, which is beyond our means as a municipality because we don't have our own tax area"* (Eindhoven, #2). The municipalities' available taxation income is mostly spent on maintaining the current size of the municipality. It has to be

noted that the income from taxes will grow as Eindhoven grows, but this income will not be sufficient for further off-site infrastructure investments, as they require large incidental funds.

However, the interviewees from Eindhoven generally regard DO to be a sustainable form of financing, even though it does not cover the entire investment. The following quote shows the general opinion on the sustainability of the DO financing method: "*I certainly think it's sustainable, because if there are fewer developments you'll need far fewer off-site facilities, because the city will not be expanding as much. The pressure on the surrounding area is now caused by a lot of new projects*" (Eindhoven, #3). Once again, the connection between urban growth and the need for DO implementation is visible. However, in order to invest in key off-infrastructure, DO needs to be supplemented with additional financial resources from either the province, national government or the EU: "*So you will never be able to finance everything from third parties, so all residual financing will have to come from the municipality, grants from the province or the state*" (Eindhoven, #3).

5.3.3 Maastricht

Contrary to Eindhoven and Utrecht, Maastricht does not make use of active land policy on a significant scale. The ambitions of Maastricht do not line up with public land banking. Firstly, the municipality does not own land in the areas where they want new developments to happen, namely the inner city. Secondly, the investment task is too big for land sales to make a significant impact: "*The pieces of land owned by the municipality and how you make money from them are getting irrelevant, but the tasks are getting bigger all the time*" (Maastricht, #1). The days that the municipal land company could afford to pay for municipal challenges are over in Maastricht.

Maastricht does make creative use of other LBF methods in order to achieve policy goals. Firstly, local levees and taxes are used for sustainable urban development. The sewer levee is partly used to fund projects for climate adaptation and water retention in Maastricht. But this is also why the citizen of Maastricht pays relatively more taxes, and that Maastricht has reached a high level of taxation in general (Jongsma et al., 2020, 2021, 2022), this is also visible in appendix 8.4. "*We then pass this on directly to the resident in the tariff*" (Maastricht, #3). Secondly, Maastricht utilises income from parking to partially fund the transition to sustainable transportation – developing new EV charging stations, adding new bicycle storages, etc. But there have been issues with this method of financing: "*In recent years, this has been very difficult because we have had deficits in the social domain, so we have had to use the proceeds to close that gap*" (Maastricht, #3). Again, it is illustrated that spatial issues get pushed to the background compared to social issues, which is negative for Maastricht's sustainable development goals. Due to such setbacks, the speed of sustainable development is slowed down significantly: "*It is actually a very diverse palette that we use for this. But on the whole, the pace is slower than we think is necessary*" (Maastricht, #3). Thus, additional money is required.

Maastricht has shown itself to be an innovator through means of the Maastricht Lab, a collaborative space for brainstorming about new urban development methods. Developments through the lab have made creative use of the LBF framework. The most interesting example of this is the realisation of a cultural hotspot in an old school. "*It was about the reallocation of a school building. There were people who came to us, they had a squatters' background and they said: we want to turn this into a creative hotspot*" (Maastricht, #1). However, the citizens had no financial means to make a large up-front investment. Maastricht decided this would solve multiple policy goals at once - helping the cultural sector, diversify the neighbourhood and provide an opportunity to local entrepreneurs. Maastricht, which owned the building, decided to lease it to the entrepreneurs for 'revenue rent', a construction that has a low base rent that will go up when enough profit is made by the

entrepreneurs. This shows that Maastricht is willing to be creative, and make use of land asset management in order to realise policy goals. The experiment was successful, but turned out not to be repeatable: "*For learning purposes it was fine. But if you have to do this six, seven, eight times, then yes, the civil service is overworked again*" (Maastricht, #1). The Maastricht Lab served its purpose and explored the application of the LBF framework, but execution is lacking due to a shortage of civil servants.

DO for off-site infrastructure is not applicable, and is not usable for Maastricht as it does not match up with their ambitions and market structure. However, the interviewees did have something to say about the sustainability of DO when it comes to planning costs. As mentioned before, planning costs cannot be entirely recovered in Maastricht, due to faults from both the developers and the municipality. Because the DO is not enough to cover the costs, the municipality has to finance them with other resources: "*At that point, we actually look on an annual basis at the total balance of our projects. Are the losses coverable from our own results? Otherwise, we have to go back to the general reserve of the municipality*" (Maastricht, #5). If DO is not enough, the municipality will tap into its own reserves in order to cover the planning costs. According to the interviewees themselves, this should only be temporary and not a structural method, because the municipal reserve is not infinite. The results show that the LBF framework is insufficient in recovering the costs that the municipality has to make, both for planning costs and the larger investment costs.

5.3.4 Comparison

The three cases have shown varied uses of the available LBF framework. The use of active land policy highly depends if the available assets (land) match up with municipal ambitions and new development locations. For Maastricht this means that the framework is relatively restricting, especially considering that DO use does not match up with Maastricht's ambitions and investment tasks. For Utrecht and Eindhoven, the framework provides more opportunities for urban growth, as both strategies match up with their ambitions. Comparing the cases, it can be said that faster-growing municipalities have more potential benefit from the available LBF framework, including the DO method. This statement is in line with earlier research by Peterson (2008), whom mentions that land-based financing is especially useful in areas with a growing population. The interviewees have not mentioned that municipalities exclude methods when favouring another. LBF methods are not mutually exclusive, and the municipality will make use of the entire framework if this is applicable for their context. If this is not the case and a method is not beneficial, it will be excluded. Thus, the practical use of DO is partly influenced by the municipalities' usability of the rest of the LBF framework, as well as context-specific factors.

Therefore, the claim can be constructed that the current LBF framework is more sustainable for rapidly growing municipalities in the long term. However, there is nuance to this claim, as the municipalities in question must be able to carry out this framework, both in terms of capacity and asset management. Additionally, the framework is also dependent on economic developments. The connection between the need for new infrastructure, amenities and facilities is related to urban growth – this has been made especially clear by interviewees from Eindhoven and Utrecht. Short term economic developments will impact the usability of the framework, but in the long term the economy should show stable patterns, which is positive for the long-term sustainability of the framework.

But it is clear that the LBF framework on its own is not sufficient for the large investments that the three municipalities require. This is further amplified by the lack of further taxation possibilities, which could generate additional funds for urban developments. All three municipalities mention that the LBF framework is merely one way of financing, and that large urban developments require multiple sources, this is in line with the information given in appendix 8.4. Next to LBF, the municipality itself is expected to contribute from reserves, as well as fellow governmental organisations – the largest being the national government. How large the dependency on the national government is for each case study, will be shown in the next paragraph.

5.4 Influence by national government

This paragraph of the results section will cover in what degree municipalities are dependent on the national government when it comes to sustainable urban development. Specifically, the positive or negative influences the government has through subsidies and legislation for municipal urban development. Next to that, other factors that promote or impede the sustainable urban development process will be discussed as well.

5.4.1 Utrecht

Utrecht is highly dependent on the national government when it comes to realising large infrastructure projects. All interviewees mention the involvement of the national government when it comes to financing urban developments and the construction of additional off-site infrastructure. This is most prevalent in the form of subsidies: "*You can never recover off-site costs entirely. (…) The rest will simply have to come from other resources, these can be resources of the municipality itself, but also resources from other governments. So, we have to apply for subsidies*" (Utrecht, #2). These subsidies can vary from small to large. Utrecht has financial stress in the Merwede area when it comes to constructing small social facilities such as schools, libraries and cultural amenities: "*In the Merwede, we do see this pressure and financial stress. And then, yes, we usually look to the national government*" (Utrecht, #2).

But Utrecht is not only dependent on the national government when it comes to smaller projects. For bigger area developments, even with a higher profit margin, the government's contribution is severely needed. An example is the residential development in the Merwede: "*We are therefore receiving a considerable contribution from the state for this project, the Housing Impulse*" (Utrecht, #1). The Housing Impulses are a series of subsidies from the government to speed up housebuilding in growing municipalities. The total amount of subsidies the government has given out adds up to 1.25 billion euros since 2019 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2021d). The subsidy is meant to alleviate the pressure on business cases when it comes to houses meant for the social sector and the affordable housing category. This subsidy can also be used for additional infrastructure that was not feasible for construction prior to the subsidisation. For Utrecht, this is a positive development, as it allows them to fulfil policy goals faster and cheaper.

Utrecht also wants to invest in sustainable public transport, and wants to expand tram lines so that short-trip commuters can leave their car at home more often. The municipality cannot pay for this out of their own pocket, and the DO method allows them to recover a quarter of the costs: "*At most, 1/4 of the costs can be recovered, and then the costs are so high that in most projects the business case cannot cover all the costs. (...) With such large investments as these public transport lines, yes, you do need money from the government*" (Utrecht, #5). The available financial framework is not sufficient enough to pay for this development, and government subsidies are necessary. The question can be asked if Utrecht is simply too ambitious. Interviewee #5 disagreed: "*Utrecht really does need to be able to grow and also to make that change in mobility. You really do need inner-city densification and growth. Yes, and you have to do that with fewer cars"* (Utrecht, #5). Especially ambitions surrounding off-site infrastructure require investments from the government, as well as the province and the EU. The interviewees also bring up the point that they are carrying out the national government's guidelines, only in the form of their own policy. However, it is becoming unaffordable to realise such projects: "*With the whole modal shift with tramlines, and healthy, strong living for all, and we as a municipality would have to pay for it ourselves? That's not going to work*" (Utrecht, #5).

National legislation affects the manner in which DO can be used for sustainable urban development. The concept of *macro capping* is written in public law, but due to information asymmetry is hard to find out if developments are feasible during negotiations for an anterior agreement. Especially when macro capping is only made transparent in the public law track – something that rarely occurs in Utrecht. "*The macro capping does mean that the programme determines what you can and may ask from the market parties, of course. So, the moment there is no profitable business case, you can't recover anything*" (Utrecht, #1). According to the interviewees, this is a logical decision, but macro capping can also be a reason why developments should always contain more free-market housing than initially planned – it can be used as a way to alleviate the business case: "*Say, you have 100% free sector housing, you can recover more costs. That relationship is clearly there*" (Utrecht, #1). The way to recover more through negotiation is to offer the developer a better business case. Another interviewee thinks that the legislation should allow for more forceable cost recovery: "*And in that sense you would actually like to have some more clarity or enforceability about what exactly is recoverable and in what way"* (Utrecht, #4). In summary, the public officers think that the notion of macro capping is used by developers to pay less contributions, as in an anterior agreement, the transparency of the agreement is left to negotiations. The legislation has no way to enforce developers to contribute more towards certain costs.

Lastly, the new Environmental Code will slightly alter the workings of cost recovery in municipalities. But the interviewees feel like the new system is too complex and leads to confusion. One interviewee mentioned the following: "*It actually becomes more obscure rather than clearer*" (Utrecht, #5). The complexity and obscurity will potentially cause delays on new policy creation and adaptation, which is negative for sustainable urban development in the short term.

5.4.2 Eindhoven

All three interviewees from Eindhoven agree that their municipality is largely dependent on the government in order to function properly. For the regular operational costs, they acknowledge that the government is a significant contributor: "*You can now see some movements in that contribution from the municipal fund. I think that about half of the money we receive annually comes from that pot*" (Eindhoven, #1). This is largely in line with the literature study, which indicates that Eindhoven receives 59.1% of their income from the national government. But still, the interviewees mention that the government's contribution is not sufficient enough for the daily operations of the municipality: "*Structurally, too little is happening. Also, the whole distribution of the municipal fund, which happens to be advantageous for Eindhoven, but is actually not enough. So, there could be a bit more on top of that*" (Eindhoven, #1). According to interviewee #1, the share of contributions Eindhoven gets from the municipal fund are already insufficient. If Eindhoven grows, the discrepancy between the current and future contributions might grow as well.

Just like Utrecht, Eindhoven needs to apply for subsidies in order to finance large off-site infrastructure. The interviewees mention that the national government is particularly interested in Eindhoven's position, as they have a special status: "*Agreements have been made about the mainport status and the contributions from the national government, but that is also all incidental money*" (Eindhoven, #1). As mentioned before, incidental money does not cover structural sustainable urban development costs. This does not mean that they receive all of the subsidies that they apply for, especially if it is unclear what should be financed by the municipality, the province or the national government: "*Still, it is quite a challenge to get that puzzle right*" (Eindhoven, #1). Sadly, the interviewees could not elaborate on the process of applying for subsidies and the intricacies correlated with that: "*Entire jobs have been set up for that, so to speak. That is a bit of lobbying towards The Hague. But that actually falls outside my scope"* (Eindhoven, #3). Thus, even though

Eindhoven's business cases are profitable, financial support from the national government is necessary in order to finance large off-site urban developments.

Eindhoven also struggles with promoting transitions for sustainable urban development. The municipality wants to create a renewed energy network for the inner-city, but the investments to spur such a transition are unaffordable for the municipality: "*Who is going to arrange it at the front end? And who will bear the financial risk? Of course, that also requires an initial investment.* (…) *Well then, there you go again, we need our big brother for that (national government)"* (Eindhoven, #2). The conclusion can be drawn that Eindhoven is largely dependent on the national government when it comes to off-site developments and the promotion of sustainable urban development transitions.

Legislation also plays a role in the sustainable urban development process. Eindhoven's public officers agree that the concept of macro capping is there to protect developers, and make sure the developer has a profit margin left. But in Eindhoven, the connection between macro capping and government legislation is not made out to be problematic. However, the interviewees mentioned other aspects of legislation as problematic, especially when it comes to cost recovery: "*the recovery of costs was actually quite difficult for the municipality under current law.* (…) *How exactly do you have to do that? How exactly should it be substantiated? What is expected of us?"* (Eindhoven, #3). Even though Eindhoven is a big municipality, the involved public officers lacked relevant knowledge and capacity in order to thoroughly implement national legislation surrounding cost recovery. Complaints about complexity, vagueness and difficult language are the main reasons for this. That is why the public officers would prefer more guidance on the topic in plain language. However, the national government made the new plans for the Environmental Code even more complex, with complaints from policy makers on cost recovery: "*I think it is too complicated. I mean, I'm highly educated myself and I'm working with this matter. But even then, I think, yes, I have to hire a lawyer again to help*" (Eindhoven, #3). The effect is that it takes longer for a municipality to properly implement new policy. Additionally, more costs have to be made if external experts need to be hired in order to understand the legislation. The complexity of national legislation contributes to the pile of difficulties surrounding sustainable urban development.

5.4.3 Maastricht

Maastricht is very dependent on the government for additional funding, both for regular operational costs as for urban development subsidies. The interviewees have mentioned multiple reasons, some which have a tendency to overlap.

Firstly, the investment task is simply too high for the municipality to carry out using their own framework and finances: "*The investment challenge is so immense, you won't even manage it with your own urban developments that you have in mind for the coming years. You're never going to make it; you really need to get the national government's money*" (Maastricht, #5). Without national funding, the energy transition, infrastructure upgrades and the mobility transition cannot be carried out in Maastricht. For this, Maastricht has to apply for subsidies. This is where Maastricht stands out from Eindhoven and Utrecht, as Maastricht is largely unable to qualify for important subsidies like the aforementioned Housing Impulse. In order to fulfil the criteria for the Housing Impulse, the municipality needs a certain quantity of houses to be built. Maastricht does not meet the criteria, which means they cannot use additional funding. "*If a regulation is then drawn up, the criteria are often even more negative for us, because our quantitative task is less demanding and we score worse, so to speak, than municipalities that have a quantitatively demanding task, while those are precisely the municipalities that could perhaps very easily finance it. So yes, it is actually a kind of reversed reality that you end up in*" (Maastricht, #3). The interviewees think that this regulation is unfair, and

only benefits municipalities that are growing rapidly, while Maastricht needs subsidies in order to make up deficits in housing developments. That is why the existence of a subsidisation method does not mean that a certain policy problem is solved for municipalities – as the criteria can be very strict. According to interviewee #5, this has to do with the cutbacks on spatial planning spending by the national government: "*That tap has also been increasingly turned back in recent years. If they are there at all, those national resources, yes, you are also very much dependent on whether your own plan will be able to get through*" (Maastricht, #5). Therefore, it could be said that government contributions are perceived as insufficient due to budget cuts. This is further amplified by declining government contributions for social facilities such as schools. Due to price increases over the years it has become more expensive to build schools, but the government's contribution has not followed this trend: "*Those national standards, that is ultimately the starting point with which education money goes from The Hague to the municipal fund. They have to be adjusted significantly, so the national government really has to step up to the plate. Also to be able to realise the new schools*" (Maastricht, #5). In short, subsidies and contributions are necessary, but are hard to attain for Maastricht due to strict criteria. The guidelines for contributions for social facilities are insufficient and lead to further financial stress in Maastricht. These factors have negative effects for sustainable urban development in Maastricht.

Legislation and national policy decisions have led to significant negative effects for the financial situation of Maastricht and for sustainable urban development. Firstly, the decentralisation of the social domain in the Netherlands has caused Maastricht to shift their focus to the social domain instead of the spatial domain. "*The decentralisations in the social domain. This has certainly had an impact in recent years, and I expect it will continue to have an impact in the future, on our disposable budget*" (Maastricht, #3). The decentralisation caused extra pressure on the municipality, as the municipal capacity had to grow in order to take on the new tasks. But the national government did not allocate a sufficient budget for the decentralisation, which meant that Maastricht had to use their own reserves, causing delays for urban development. "*This means that there is less room to do something in the other policy spheres. And you see the balance of expenditure in the physical sphere compared with the social sphere, you see it going further and further towards the social sphere*" (Maastricht, #4). The lack of available funds leads to delays, as projects have to be financially feasible in order to commence. For certain projects a shorter timeframe will lead to a higher peak in investments – such as climate adaptation and mitigation measures before 2050. In general, the interviewees are critical and negative about the way the national government has decentralised tasks.

The interviewees are also uncertain about the course of the national government regarding spatial planning regulations. "*You now see, for example, a memorandum from the minister every week about house building. Well, then I wonder: how are we going to achieve this, and can we achieve it together at all?*" (Maastricht, #4). Unexpected anouncements lead to a lesser degree of certainty and stability in the urban planning department of Maastricht. The uncertainty is further amplified by the extension of the Environmental Code which gets pushed forward every year. Even though the municipality is preparing for it, having certainty about an implementaiton date would be beneficial for policy creation. Thus, the national government influences Maastricht's ability to develop sustainably also through decision making and legislation.

5.4.4 Comparison

All three municipalities turned out to be highly dependent on the national government, both in terms of operational costs and urban development subsidies. This is in line with earlier literature study on the financial workings of the municipality in paragraph 4.1.1. But the empirical research has determined that these municipalities also need significant contributions from the government for incidental costs in sustainable urban development projects. However, structural contributions from the government are insufficient.

The insufficiency of structural contributions is mostly visible when looking at decentralised tasks, which have been paired with budget cuts for the respective municipalities. This problem especially comes forward in Maastricht, which has delayed or cancelled urban development projects in order to pay for social programs, as the structural contributions are inadequate.

Subsidies are necessary for each municipality in order to carry out their sustainable development ambitions. The results show that subsidies have strict criteria. For housing, and the included funds for off-site infrastructure, the subsidy is tied to housing quantity. Thus, such a subsidy is not applicable for Maastricht, as their housing ambition is relatively small due to their stagnating population growth. Therefore, Maastricht finds itself between a rock and a hard place, as their LBF framework does not allow for many costs to be recovered, partly because of the small contribution from new developments. But they cannot get subsidies to fill this gap because they are not developing enough houses in the near future. This is the opposite of Eindhoven and Utrecht. Interviewees from those cities clearly stated that the process of subsidy application is hard, but mostly comes to fruition.

Lastly, national legislation has an effect on the municipalities' ability to quickly implement new policy and carry on with their sustainable urban development goals. All three municipalities complained about the complexity of the upcoming Environmental Code, as well as the fact that it has been pushed forward numerous times. This leads to uncertainty among the interviewees about the implementation of the law. Next to that, policy decisions made by the national government can alter ongoing processes, which is experienced negatively in Maastricht. The municipality has to adapt and has to cope with a lower degree of stability.

To conclude, the influence of the national government on individual municipalities is large. Their finances are mostly determined by contributions from the municipal fund, as well as large subsidies for urban development projects. Without contributions from the national government, all three municipalities are unable to carry out their planned policy objectives surrounding sustainable urban development. This means that municipalities have to rely on incidental funding, which, according to the interviewees, cannot be regarded as a sure-fire way to plan sustainable urban development for the long term.

5.5 Bargaining process

The relationship between the practical implementation of DO and sustainable urban development can be influenced by bargaining, as seen in the theoretical framework under 'Negotiation Theory'. This paragraph focuses on the bargaining process in each municipality, and illustrates how aspects of the bargaining process might influence the relationship between DO and sustainable urban development.

5.5.1 Utrecht

The municipality of Utrecht works primarily with anterior agreements when recovering planning, on-site and off-site costs and contributions. Anterior agreements are decided upon through negotiations between the municipality and the property developer. Negotiation theory highlights trust as an important factor for successful negotiations (Kong et al., 2014). The public officers in Utrecht struggle with estimating the trustworthiness of developers. One interviewee even mentions distrust: "*Well I do not trust them, like I said with the crocodile tears. If they say that a project is unfeasible, then I already don't trust that*" (Utrecht, #4). A lack of trust leads to more strenuous negotiations: "*I think that if you are suspicious of each other beforehand, the process is difficult*" (Utrecht, #3). Thus, the lack of trust and the presence of distrust make the negotiation process more difficult. This means the chance for an optimal win-win outcome is smaller, which is in line with negotiation theory (Kong et al., 2014). For Utrecht, there appears to be deterrence-based trust between them and the developers. They can only believe the other party to stay true to their word, with negative consequences if this is not the case (Lewicki & Polin, 2013).

One major hindrance is information asymmetry. Every interviewee mentioned the lack of information as being negative for the negotiation process. In practice, this amounts to developers having more information and knowledge about certain aspects of property acquisition and development: "*You do have a disadvantage in some areas, I think. When you talk about building costs, for example, (…) big developers are much closer to that kind of input and information"* (Utrecht, #3). Next to uncertainty about building costs, it is difficult for the negotiators to estimate acquisition costs of relevant land or property. A high acquisition costs for the developer can lead to less potential cost recovery, and a smaller margin in general, this is negative for the negotiation process: "*What you often see is that they want it just a little too much and therefore pay too much, and then you actually start from a disadvantage, you could say, with enormous pressure on the negotiations*" (Utrecht, #1). Another hindrance is that developers in Utrecht get political when negotiations are stagnating, and contact political executives like aldermen (*Wethouders*) in order to gain leverage. The municipal negotiators experience this as demotivating and ethically wrong, but they understand why developers make this move from a tactical standpoint: "*But the most annoying thing I find is when in that process, it is made administrative. I then think: but you can also work it out together. (...) But of course you can use that as a tactic*" (Utrecht, #3). The political aspect of negotiations is new, and was not found when conducting the literature study.

Negotiations in Utrecht generally have a positive outcome for the municipality. A pattern is visible that the interviewees are satisfied with the outcome when negotiations result in completing policy ambitions, instead of maximising cost recovery. However, the general attitude is that not every bargaining process results in a 'perfect score'. "*You cannot get a 10/10 in all areas, and that is ultimately what you then negotiate*" (Utrecht, #1). Furthermore, there does not seem to be a power difference or unjust hierarchy during negotiations. The interviewees do not feel outmatched by opposing parties, and have plenty of instruments to work with. "*But I do actually think that it works out equally, also because we are often the lead party for the contract in the negotiations. This means*

that we always present the first draft, in which you have already positioned yourself as a kind of equal discussion partner" (Utrecht, #3).

Negotiations require a certain skillset. Public officers in Utrecht are satisfied with their own skills and knowledge when it comes to negotiating with developers. However, there can be instances of public officers not being up to speed about every subject regarding urban development. For that, Utrecht regularly hires external experts. But a serious lack of skills or knowledge is not prevalent in Utrecht. Additionally, Utrecht does not deal with a large shortage of public officers. At most projects will have slight delays due to a lack of personnel. "*Well, yes, we are short of people everywhere, so I think in this aspect too. but then, these are often things that take a bit longer"* (Utrecht, #4). The primary concern is not the short term, but the long-term vision of growth and the municipal capacity to facilitate this growth within the organisation.

Lastly, the interviewees mentioned potential improvements for the bargaining process. Transparency is the most mentioned point for improvement, however it is also acknowledged that negotiations are the opposite by nature: "*But, after all, it is inherent in negotiations that you hold your cards up here and there*" (Utrecht, #1). A call for a methodological negotiation process was also mentioned, especially when it comes to off-site infrastructure negotiations. An off-site fund has such traits as the contribution is fixed, which leaves less room for negotiation. To conclude, the interviewees mentioned that analysing the negotiation process afterwards together with the opposing party can lead to improved bargaining processes in the future. This is especially relevant if the municipality intends to cooperate with parties for a long time.

5.5.2 Eindhoven

The bargaining process in Eindhoven also suffers from hindrances. Trust issues between the municipality and developers stem from information asymmetry: "*They will always try to see if there is room for some things to be cut so that they can make a little more money. That's just the way they are, so it's very difficult to put your finger on it. Is this because it really can't be done, or is it just because they are optimising?"* (Eindhoven, #1). The information asymmetry mostly comes from uncertainty about building costs and previous land acquisitions related to the business case. Next to that, the financial feasibility of the project for the developer leads to information asymmetry. In order to combat this, Eindhoven makes use of 'shadow calculations' in some projects, calculations with the intention to estimate an exploitation for a developer: "*We have had a model developed so that it is fairly easy to calculate the business case of such a private party, also in the context of all the requirements, so to speak, that we impose on those parties*" (Eindhoven, #1). However, the calculation does not reflect reality, and is plagued by estimated information: "*At the front end, you draw that up, and then of course you have to make a business case based on rough figures, because there is a lot you don't know*" (Eindhoven, #2). The municipality tries to overcome information symmetry, but in practice they find themselves at a disadvantage, causing them to trust developers to a lesser degree. But the interviewees did not specifically mention distrust in Eindhoven. Calculus-based trust is prevalent in Eindhoven – the municipality tries to be rational by doing shadow calculations on which they try to base their judgement (Lewicki & Polin, 2013).

Eindhoven has their signature off-site infrastructure fund. The primary hindrance during negotiations is that developers want the municipality to spend the funds on adjacent projects to their development. Developers want the municipality to invest in their area, not in the context of the entire city, defeating the purpose of the fund. However, the contribution amount is not discussed, as that is hard policy: "*And you never really discuss the principle. It's always about the interpretation for this place*" (Eindhoven, #2). Since the introduction of the fund, they have had less complaints from

developers that the contribution came unexpectedly, but this still occurs and can be used as a negotiation tactic by the developer. If the developer says that the contribution cannot be paid, the municipality will negotiate and see if the development has some 'wiggle room' in the business case. But off-site contributions will always be paid to the municipality (Eindhoven, #2).

Interviewees in Eindhoven mention that the bargaining process itself sometimes leads to a negative outcome for the municipality. This has to do with the linearity of the process itself. Negotiations about the housing programme – the division between expensive and social housing – happens before negotiations about cost recovery, but according to the interviewees those subjects are inherently related and influence each other: "*But if you are already giving away a lot to that mass/volume at the front, it is difficult to start recovering costs at the end. Because then you have already given a lot*" (Eindhoven, #2). But in general, the interviewees are satisfied with the results of the negotiation, but they do mention that negotiations are a two-way street. In practice this means that municipality has to concede on certain issues, such as social housing or out-of-sight parking.

Municipal capacity also plays a role in negotiations. Eindhoven is dealing with a shortage of public officers. The following quote illustrates their struggle: "*Eindhoven has an enormous ambition and its civil service is not equipped for it, neither in terms of quality nor quantity. (…) In Eindhoven there should be explicit prioritization in the things that we can and cannot pick up at the same time in order to keep the workload manageable*" (Eindhoven, #1). In practice this means that negotiations can take longer than necessary, because there are simply not enough public officers to fill the demand for new projects. Thus, the municipality has to prioritise what projects get taken on, causing negative consequences for Eindhoven's growth and ambitions. In addition, the outcome of some projects can be influenced by personal constraints: "*There are a lot of project leaders who are more focused on process management rather than content, and thus have not always developed sufficient baggage of the development process and property development*" (Eindhoven, #2). But in practice, colleagues will intervene if a project is at risk of having an unfavourable outcome.

Lastly, improvements for the bargaining process to stimulate a more favourable outcome were mentioned. The first being that the bargaining process should be more integral instead of linear. An integral bargaining process will ensure that cost recovery will not suffer from decision made earlier on in the negotiations, and will potentially lead to more cost recovery. Secondly, the use of shadow calculations can be more widespread. "*Or we can very quickly make a shadow exploitation plan calculation for each project. I think we do that too little. (…) For both the planning costs and the plan-related costs*" (Eindhoven, #3). Using this calculation method on every project will deter some degree of information asymmetry, if the elements are estimated correctly.

5.5.3 Maastricht

The bargaining process in Maastricht differs from Eindhoven and Utrecht because no negotiations for off-site infrastructure take place. The bargaining process in Maastricht primarily focuses on the 'regular' negotiation topics such as the housing programme and policy ambitions regarding sustainable urban development. The interviewees mention that bargaining is a process of power and the attainment of goals. According to interviewee #4, there is a power difference between the municipality and developers. "*You're always 1-0 behind as a government in a negotiation because you cover the public domain. Everything you decide or everything you deploy; you have to account for publicly. A private party never has to do that*" (Maastricht, #4). While the municipality has local power, it also has to be held accountable by the public. This limits the strategies that public officers want to use, and causes an unfair balance in Maastricht. The power difference is also clear when

looking at landownership: "*When it comes to private positions, only when you have ownership, then you can steer very hard. Then you can steer harder than with the public instruments*" (Maastricht, #4). The municipality has more power when it has active land policy. But most of the developments in Maastricht happen with facilitating land policy, which limits the municipality to public instruments. The power balance in Maastricht can be acknowledged as a major hindrance in the negotiation process.

Next to that, information asymmetry and trust issues also take place in Maastricht. Just as in Utrecht and Eindhoven there is uncertainty about the developer's financial situation. "*But you can't look in the books of the entrepreneur, of those private developers*" (Maastricht, #5). Interviewee #5 even mentions that the municipality has an active disadvantage regarding information asymmetry: "*And the other way around, the municipality has to put almost everything on the table, so to speak*" (Maastricht, #5). The information asymmetry causes a lower degree of trust, especially when developers do not display transparency themselves. In Maastricht, deterrence-based trust is still prevalent, as their complete uncertainty ensures that it is hard to produce a rationalised judgement. The chance is high that the other party will breach their frail trust, with negative consequences for Maastricht (Lewicki & Polin, 2013).

Time and politics also play an important role in the bargaining process. The negotiation position of the municipality weakens when the timeframe is smaller. "*But time is very important. The more time you have, the better the result will generally be*" (Maastricht, #4). This goes hand in hand with the public opinion on certain issues: "*If something has to be done in the public eye. yes, you are 10-0 behind*" (Maastricht, #4). Developers realise when the public officers experience pressure from citizens, and use this as a leverage tactic. But the public opinion can also help when finding additional funding.

In general, the public officers are satisfied with the negotiation results. But when results are unsatisfactory, it cannot be blamed on the skills of the negotiator. This is clear when reading the following conversation between two interviewees: "*I am very satisfied with some of the results we have achieved, but I am not equally satisfied with all of them*" (#4). "*Is that because of the quality of the negotiations or the starting position, I think the latter, right*?" (#3). "*Yes, usually*" (#4). The interviewees mention that Maastricht has very capable negotiators and enough municipal capacity in order to fulfil all obligations. Negotiations with a negative outcome are to be blamed on the context, time, and public opinion.

Potential improvement for negotiations focuses on transparency from the municipal side. According to interviewee #5, planning costs can be reduced if the municipality has clear guidelines in what they can and cannot do during a project. Additionally, the municipality should react firmly to requests from developers if they demand something that the municipality has not agreed upon: "*That you then say, yes, but this is not what we agreed on at the beginning. Then you have to pay those costs extra. In my opinion, we do this far too little now*" (Maastricht, #5).

5.5.4 Comparison

In all three municipalities, the main hindrances that impact the negotiation process are related to information asymmetry. This affects trust, the speed of negotiations and the amount of potential cost recovery. Combatting information asymmetry is hard for municipalities, and even methods such as shadow calculations are estimates at best. It can be said that information asymmetry and its external effects negatively impact the negotiation process. In turn, the implementation of DO and cost recovery can be negatively influenced as well. The municipalities in general have a low level of trust towards developers. This has to do with their different motives and objectives, the Zone of Possible Agreement (ZOPA) is relatively small (Caputo, 2015). Deterrence-based trust is the most common, and spreads to calculus-based trust if the municipality can actively estimate if the developer is telling the truth about their financial situation (Lewicki & Polin, 2013).

Overall, the interviewees are satisfied with negotiation results, but realise that not every ambition can be fulfilled completely. The interviewees realise that in order to get something from developers, they must give things away as well. In all three municipalities, the housing programme is the most influential when it comes to the bargaining process because it determines the business case and potential DO implementation. Negotiating for cheaper housing will lead to fewer other policy ambitions being fulfilled in all three municipalities, with potentially negative outcomes for cost recovery. The negotiations about the housing programme are therefore leading when it comes to creating a bigger margin for additional contributions and policy ambitions.

Capacity plays a small role in the effects of the bargaining process, and mostly leads to short delays in projects. Only Eindhoven has mentioned complete cancellations and heavy prioritisation. Furthermore, all three municipalities mention that the skillset of the negotiator is crucial for a good outcome. When this is partially inadequate, the colleagues will intervene. Power differences and hierarchy in negotiations influence the bargaining outcome only slightly, but will be more influential if the opposing party owns land positions. Mainly Maastricht has trouble with dealing with power structures in negotiations. Not only because a lack of land positions, but also because the business case allows for a smaller margin compared to Eindhoven and Utrecht, which means that the developer has less room to negotiate over. Finally, Maastricht mentioned that negotiating as a public body will always be disadvantageous because a municipality has to be held accountable by the public. This has not been mentioned in Eindhoven or Utrecht. Thus, it could be a negative factor that solely influences Maastricht, and a strong indication that Maastricht needs additional bargaining tools or methods to strengthen their position, such as land positions or bigger financial reserves.

Lastly, the municipalities call for improvements when it comes to transparency. Many interviewees find it difficult to do their job if they cannot estimate if the proposal is accurate in terms for the developer. The fear of ‘leaving too much value on the table’ is real, and causes public officers to doubt their abilities and methods in the negotiations process. However, the interviewees do think they have tried to get the best out of the negotiations. The theory of missing potential value during negotiations, mentioned by Sebenius (1992) in Caputo (2015), is therefore in line with the empirical research results.

5.6 Policy process

The practical implementation of DO for sustainable urban development can also be influenced by the policy process, as seen in the theoretical framework under theory B: 'Policy Change and Implementation Theory'. This paragraph focuses on the policy process in each municipality, and shows how certain aspects of the policy process might influence the relationship between DO and sustainable urban development. Policy change and implementation will be discussed respectively.

5.6.1 Utrecht

First and foremost, municipal policy for urban development gets written in order to be carried out by developers. The municipalities' main task is to get others to implement as much of that policy as they can: "*we are actually trying to get others to realise our goals*" (Utrecht, #4). Therefore, the policy process from a municipal side is detrimental for the outcome and its practical implementation.

Utrecht was dependent on active land policy for large urban expansions before the crisis in 2008. But currently, the municipality mainly takes a facilitating role: "*It used to be quite normal to have active land operations, but now we're moving more towards facilitating land policy*" (Utrecht, #2). Comparing this to theory, the change from active land policy to facilitating land policy has its roots in the *Advocacy Coalition Framework* (Sabatier & Jenkins-Smith, 1988). This means that external economic shocks have driven Utrecht to be more facilitating, and have caused the municipality to adapt. A difference is that active land policy allowed for potential profit, instead of merely cost recovery: "*And projects developed on private land, in which the municipality is actually only a facilitator, in principle do not have a plus*" (Utrecht, #4). Thus, there is a potential downside for facilitating land policy. According to an experienced interviewee, the municipality has handled this change in land policy and cost recovery well: "*Both (forms of land policy) are topical. And have been for quite a long time. So yes, I think people are well suited to that*" (Utrecht, #5).

The implementation of DO is largely influenced by established policy. As mentioned before, Utrecht has no hard policy for off-site infrastructure and is reliant on negotiations for contributions. For sustainable urban development and Utrecht's policy goals, this has the consequence that there is less certainty about policy ambitions in each project. The results have shown that negotiations for DO will cause policy deviations: "*But that does mean that it (DO) may be at the expense of other ambitions, such as the housing programme or sustainability. At the moment, this is still largely a matter of negotiation*" (Utrecht, #2). Utrecht cannot implement all policy ambitions and ask for a large DO contribution. This shows the dilemma between wanting off-site infrastructure contributions and realising other policy goals. "*There is an area of tension, and yes, in that sense it (DO) also competes with the fulfilment of other ambitions*" (Utrecht, #4).

The implementation of policy for sustainable urban development is successful based on the following reasons. Utrecht has a high degree of inter-organisational communication: "*I think it is going better and better, also internally, that we are no longer in our policy box, but also dare to look beyond the edges*" (Utrecht, #2). In addition, the public officers have the right knowledge and expertise when it comes to policy implementation. And if this is not the case, the rest of the team will help: "*If you have a question, or if you are not sure about something, you can always ask your colleagues here. (…) Knowledge should not be a bottleneck*" (Utrecht, #5). Furthermore, the attitude and disposition of the implementors in Utrecht are positive: "*we make policy as a municipality and you want to see it reflected in projects as well*" (Utrecht, #3). These mentioned reasons overlap with the theory by Gornitzka et al. (2005) and Cerna (2013), no discrepancies were found.

But there are also reasons why the policy implementation process can hamper sustainable urban development. The first reason is a lack of municipal capacity, especially when looking at long-term

policy goals. There are too many ambitions for the current size of the organisation. The quotes "*we are short of people everywhere*" and "*capacity is sometimes a bottleneck for us*" illustrate this (Utrecht, #4 & #5). Capacity shortage can have negative consequences for implementing policy, and can result in a less than favourable outcome when looking at sustainable urban development in the long run. Secondly, Utrecht sometimes lacks funds for specific types of policy, as the city council has to spend it on more pressing matters such as social security and healthcare. In the long term this can lead to shortages for urban development. An interviewee mentioned that the budget is insufficient for their ambitions: "B*ut within the built environment, so to speak, I would prefer to have more budget in order to be able to make other interventions as well*" (Utrecht, #4). Lastly, Utrecht has the tendency to ask too much of a developer, which leads to a developer being uneasy or reflective. *"Sometimes developers do experience it as 'stacking'"* (Utrecht, #3). In turn, developers will mention that they cannot afford some policy ambitions, which causes issues surrounding trust and information asymmetry. These negative factors within policy implementation (lack of capacity and funds) also show similarities with the aforementioned theory. The 'stacking' of policy ambitions could be classified as incompetence of the policy team (Cerna, 2013).

5.6.2 Eindhoven

Eindhoven shows similarities with Utrecht when looking at policy change and the underlying reason for the switch to facilitating land policy. "*Eindhoven made a movement after the credit crisis, not very consciously I think, but towards more facilitating policy*" (Eindhoven, #1). An external shock that has pushed Eindhoven to change their policy also overlaps with the *Advocacy Coalition Framework* (Sabatier & Jenkins-Smith, 1988). However, because Eindhoven does have hard policy for off-site contributions, the argument can be made that *policy learning* – learning from new developments and creating suitable policy - is also at play. Eindhoven also displayed the interest for renewed active land policy in order to steer developments more. The interviewees mentioned that the public officers are fit to adapt to this change: "*I have the idea that we are active enough on this, say a number of people who are really busy with an active acquisition plan and things like that*" (Eindhoven, #3).

Eindhoven has hard policy for off-site DO. For policy implementation in general, this means that the developer always contributes to off-site infrastructure. This means that Eindhoven has to be careful what they ask additionally to the contribution. Therefore, Eindhoven has to prioritise what demands it will make in order to achieve their policy goals: "*And we can't just lump the whole package together and throw it over the fence of the private party, so we have to make choices*" (Eindhoven, #1). This seems to be a recurring theme, as the policy process is strongly linked with the negotiation process. Afterall, the municipality needs private parties to implement municipal policy. So also, in Eindhoven DO implementation affects policy implementation, and in turn influences sustainable urban development: "*We have goals on greening, housing programme, sustainability. But in the end, the project has to be developed. (…) To achieve a 10 on all those interests is laborious, but an 8 or a 6 is also sufficient*" (Eindhoven, #2).

When analysing if the policy process in Eindhoven is successful regarding DO and sustainable urban development, Eindhoven primarily stands out because of its transparent off-site contribution policy. This policy has a clear aim and shows transparency to developers in the policy process. As a result, this policy is successful in garnishing contributions, this is in line with the theory on successful policy implementation (Cerna, 2013). However, transparent DO policy is not a pull-factor for developers: "*It does not deter or stimulate developers to come to Eindhoven. Eindhoven is simply attractive, therefore developers want to make projects here*" (Eindhoven, #1).

However, the interviewees mostly mentioned negative influences on the policy process. Firstly, the aforementioned shortage of public officers plays a role in the speed and scale at which policy can be implemented. "*It's just slower. Look, you know, there's always some way of catching up. But it's a bit more laborious then, so it all takes longer*" (Eindhoven, #2). The interviewees point out that the labour shortage is the cause for this. Secondly, policy decision making is negatively influenced by the disposition of some public officers related to their own field. Some policy departments want all of their ambitions to be included: "*In the municipal organisation, each sector still tends to express its own ambition in a policy document and links all kinds of conditions and requirements to it*" (Eindhoven, #2). As a result, the developer will have to enter negotiations about the business case and the feasibility, as the total amount of policy packages are too much. This is similar to Utrecht, where the municipality also acknowledged that they 'stack' ambitions. And to make matters worse, the municipality will cling to their ambitions, even if the developer mentions financial feasibility: "*And I myself honestly think that we are also holding on too long to the ambitions we have in various policy areas*" (Eindhoven, #2). This puts a halt to progress, and slows down development. The disposition of the public officers, many ambitions and clinging to ambitions can be classified as: the nature of the implementor, inter-organisational communication and characteristics of the agencies respectively. Combined with a shortage of implementors, Eindhoven is lacking in crucial components of the policy implementation process (Cerna, 2013), with negative effects for sustainable urban development.

5.6.3 Maastricht

Similar to Eindhoven and Utrecht, Maastricht's use of land policy also changed due to the financial crisis in 2008. Again, the *Advocacy Coalition Framework* of policy change is visible here (Sabatier & Jenkins-Smith, 1988). This had detrimental consequences for Maastricht's position when it came to policy implementation. Large urban developments used to be financed with the surplus from public land developments. The municipality was partly financed with land sales and leases: "*In the past, you saw that the land company was a cash cow for the municipality. (…) Until 2008, that was really standard, and it enabled us to realise social policy through land exploitation, but that is no longer the case*" (Maastricht, #4). Maastricht's unwanted policy change has caused them to be worse-off financially. After the crisis, the land company went bankrupt and had to be subsidised by other municipal sources. The ripples of the crisis are still noticeable today, as Maastricht holds no significant land positions on which will be built in the coming years: "*There aren't any greenfield developments anymore, everything is within the city. We are lucky if we break even*" (Maastricht, #4). Furthermore, Maastricht has only partially adapted their cost recovery policy. As no costs are recovered for off-site infrastructure, Maastricht is limited to the national framework of legal cost recovery for planning and on-site costs. Thus, Maastricht's adaptation to the facilitating policy framework has been quite poor, with potentially negative consequences for sustainable urban development in the long run.

Examples of successful policy implementation in the policy process derive from the knowledge and capacity that Maastricht has. The interviewees mention that there is no capacity shortage in Maastricht when it comes to policy implementation. Also, ample knowledge and experience show a positive influence on sustainable urban development: "*Look, you know what our advantage is? We have been doing this for a long time, and so have some of our colleagues and planners. Yes, that does help a lot, doesn't it? Then you have already experienced everything once*" (Maastricht, #3). This is in accordance with the theory that policy implementation benefits from the size, skillset and competence of the team (Cerna, 2013). Furthermore, Maastricht is actively taking steps in researching new policy methods through the Maastricht Lab. Interviewee #1 mentioned that Maastricht uses this as a knowledge sharing space, the interviewees' role was to research and deploy

new methods of financing, while simultaneously reaching policy goals: "*Maastricht lab has been a platform, an experimentation space, in which we actually carry out all kinds of small-scale projects and experiments to discover new forms of urban development*" (Maastricht, #1). Taking a pro-active stance on experimenting and implementing new policy shows initiative and an underlying motivation to implement the right policy, signs of successful implementation and *policy learning* (Cerna, 2013) (Sabatier & Jenkins-Smith, 1988). However, paragraph 5.3.3 showed that the Maastricht Lab had no means to execute and steadily implement new policy due to a shortage of civil servants, indicating that capacity can be a problem in Maastricht.

However, there are also reasons why the policy implementation process is suboptimal in Maastricht. Firstly, there appears to be a 'stacking' issue when it comes to policy ambitions, similar to findings in Utrecht and Eindhoven. However, because Maastricht aims for affordable housing, there is no large margin for additional policy ambitions to be fulfilled by the developer. As a result, developers that work 'in the margins', such as housing corporations, have difficulties to break even on their business cases. This causes the municipality to deviate from existing policy, as they are unwilling to finance the difference: "*Either you lower your demands, dear municipality, on subject A, B or C, or you contribute and then we can realise it together. Municipalities are not so inclined to do the latter*" (Maastricht, #1). Secondly, there seems to be an issue regarding the development of new policy while negotiations already take place: "*Sometimes, along the way, new policy decisions are made by the municipality that have been adopted by the Council, which you then want to incorporate into a particular project*" (Maastricht, #5). This often leads to the project being delayed and in turn, sustainable urban development will take longer and will be more expensive due to larger planning costs – which Maastricht cannot recover completely. Knowing this information, it is confirmed that the municipality is also at fault for making more planning costs: "*Yes, we as a municipality are also guilty of making additional demands during the process*" (Maastricht, #5). Finally, the inter-organisational communication is lacking as well. Especially during experiments with new forms of urban development, interviewee #1 encountered how difficult it is to collaborate on projects with multiple policy sectors, especially when it came to smaller projects: "*In that respect we are such a very compartmentalised organisation*" (Maastricht, #1). These reasons for a suboptimal policy process correlate with the reasons mentioned by Cerna (2013). The policy 'stacking' and the last-minute incorporation of new policy can be classified as general incompetence, while the lacking communication between departments is a sign of bad inter-organisational communication.

5.6.4 Comparison

The three cases have displayed similarities and differences when it comes to the policy process. Firstly, Policy Change Theory represented itself through the *Advocacy Coalition Framework* of policy change (Sabatier & Jenkins-Smith, 1988). In all three municipalities, the switch from active land policy to facilitating land policy happened due to an external economic shock. But the municipalities have shown that they handled the change differently, especially when looking from a perspective of DO and sustainable urban development. According to the interviewees, active land policy allowed for more capturing of surplus value that could be used to invest in other off-site projects. With facilitating land policy, that contribution is negotiable and dependent on policy. A clear difference between Eindhoven (hard off-site policy), Utrecht (only negotiations for off-site) and Maastricht (no negotiations for off-site) is visible here. Eindhoven has adapted the best to the external policy change.

The theory on Policy Implementation is viable, as the interviewees have mentioned reasons why policy implementation is (un)successful in their municipality. These reasons largely correlate with the theory based on Gornitzka et al. (2005) in Cerna (2013). The success of policy implementation is largely dependent on (1) policy standards and objectives: the aim of the policy. (2) Policy resources: the funds made available for that policy. (3) Inter-organisational communication and enforcement: sharing of knowledge between departments. (4) Characteristics of implementing agencies: the size, skillset and general competence of the responsible team. And (5) the nature of the implementers: the underlying motivations, rationality and attitude.

The degree to which municipalities show positive or negative scores on the aforementioned variables differs. Maastricht and Eindhoven mentioned the lack of inter-organisational communication, while Utrecht saw this as a positive. Adversely, municipal capacity is a problem in Utrecht and Eindhoven, while Maastricht has no issues regarding capacity, except when trying out new forms of urban development in the Maastricht Lab. However, all three municipalities have the tendency to ask too much of developers - policy 'stacking' is seen as a factor why finding the balance between sustainable urban development and DO implementation is difficult. Thus, DO implementation and policy implementation for sustainable development are inherently connected. DO can be a policy goal on its own, but can also be seen as a financial method to achieve further policy goals with. And because policy implementation happens through development projects, the implementation of DO and other policy are connected. In the three cases, more DO generally mean that there is less room for additional policy goals connected to a development, such as circular building policy, parking policy or social housing policy.

Lastly, the theory mentioned that successful policy is partially determined by the trends surrounding politics, the economy and social conditions (Cerna, 2013). In practice, the municipality is bound by the business case of the developer in order to implement policy through developments. The bigger the margin for a housing development, the more room there is for additional policy or DO. The results show that once a business case is in trouble, the developer will be less likely to cooperate on additional policy demands. This also hampers the policy process, and potentially has negative consequences for sustainable urban development goals.

5.7 Discussion

This paragraph discusses the results in comparison to earlier literature review and the theoretical framework. After that, a renewed conceptual model will be presented based on the empirical findings. In terms of structuration, this paragraph follows the same order as the results section.

Sustainable urban development

The results have shown that it is increasingly hard for the three municipalities to develop sustainably without additional government support. The challenges that the municipalities face regarding affordable housing, infrastructure, climate adaptation and the energy transition are unaffordable for them. This is in line with the broader sentiment that local governments lack resources to carry out these policy ambitions (Camagni, 2016). Interviewees from all three municipalities mentioned that the ambitions are too high for their current financial capacity, and that external government funds are needed to turn ambitions into reality. An important reason is that the three municipalities are mostly focused on brownfield, inner-city developments. The exploitation of land is simply more complex, expensive and time consuming. According to Stauttener & Boelman (2021), this is a trend which is happening in the entire country when it comes to urban municipalities. Additionally, densification in existing urban structures requires more off-site infrastructure to be built, but because the three municipalities do not own (m)any public land positions in the inner city, cost recovery through public land banking is not possible. Stauttener & Boelman (2021) signify that this occurrence is more the norm than the exception, and that cost recovery is therefore more complex and insufficient.

Interesting is that all interviewees think that the current economic developments threaten the ambitions of the municipalities even further. High inflation rates, the labour shortage, supply chain issues and rising material costs make developments more expensive. This was not directly found in earlier literature study – but indicates that the ambition from a municipality to develop sustainably is very dependent on economic developments, especially when the developer's business cases become less feasible. Instead, the literature did indicate a correlation between economic growth and consumer income, willingness to invest and willingness to move (Haffner & Van Dam, 2011), potentially lowering land values for developers. But lower land values for developers have not been mentioned in the interviews, mostly because the current housing prices keep rising, and as of May 2022, housing prices in the Netherlands are up 18,8% over May 2021 (CBS, 2022f). This indicates that the demand for housing is still high, and that consumers are willing to invest in Dutch real estate. Changing consumer income, willingness to invest and willingness to move have not been observed as factors that influence a developer's business case in the three municipalities. The economic developments threatening the business case seem to stem from the supply side, rather than the demand side.

Furthermore, interviewees from all municipalities noted that the DO method can be partially used to develop sustainably as long as the city is growing. This is in line with Peterson (2008), and the statement that land-based finance methods are best used in urban areas with a high degree of growth. The connection between the demand for off-site infrastructure and economic growth or decline came forward in the interviews. The positive relationship between those variables ensures that the DO method is less suited for a declining economy when it comes to financing off-site infrastructure, because there will be less urban growth and less demand for new infrastructure. Theoretically, this is partially related to Haffner & Van Dam (2011), as economic decline will generally cause less people to buy homes and move into a new city, requiring less supporting off-site infrastructure being built. But the practical correlation with DO usability has not been combined before, but was strongly represented in the interviews.

Practical implementation of DO in Dutch municipalities

Desk research about the theoretical implementation of DO will be compared with the empirical findings. Firstly, the implementation of DO mostly stems from the lack of public land positions in the respective municipalities. This is in line with literature on the abandonment of active land policy (Hendricks et al., 2021). Secondly, the reasoning or 'rationale' behind DO is clear in the three municipalities: those who profit, should contribute to the community (Muñoz Gielen & Lenferink, 2018). The literature also suggests that planning costs and on-site costs are fully recoverable in the public law track and the private law track after negotiations (Muñoz Gielen & van der Krabben, 2019) (Hendricks et al., 2021). In practice, this is not the case. Due to complex area development processes and poor coordination between the municipality and the developer, planning costs can exceed the legal recoverable basis. This can be seen in Maastricht. However, on-site costs are fully recoverable in all three municipalities, as the relevance is clear for both the municipality and the developer. The empirical research has also shown that municipalities prefer the private law track due to flexibility and the ability to receive more contributions. This is also in line with the literature (Muñoz Gielen & van der Krabben, 2019). Furthermore, the literature mentions that *macro capping* in the public law track can lead to difficulties regarding DO and feasibility (Sorel et al., 2014). The research has proven this statement is correct, but also is applicable to the private law track. Developers use macro capping in the private law track to their advantage in negotiations, as the municipality suffers from information asymmetry. Therefore, it is up to negotiation to find out if the developer's feasibility statement is correct.

Muñoz Gielen and Rheinfeld (2016) stated their worries about DO, as this method will only cover a small percentage of the investment task. Over time, this would mean that small investments cumulate into immense amounts. In practice, this relationship also has been found. Because of the relatively small contribution from developers, off-site infrastructure largely has to be financed using other methods such as government contributions. Lastly, the empirical research indicates that municipalities do not capture the maximum amount of value when garnishing off-site contributions. However, the consideration for this stems from finding a balance between realising policy ambitions and financial contributions. All three municipalities strive for 'optimal' cost recovery instead of 'maximum' cost recovery. This goes against the report from Stec Groep, as they stated that municipalities do not demand compensation for recovering less costs (Stec Groep, 2021). In practice, the compensation is visible in additional policy ambitions that are realised within the project itself.

Land-based finance framework for Dutch municipalities

The results have shown that the LBF framework gets utilised differently by each municipality, and it is dependent on available assets and municipal ambitions. Desk research has shown that the LBF framework is responsible for a relatively small part of the municipal balance sheet (Ministerie van Financiën, 2022), which is something that the interviewees confirmed. Therefore, it is not unexpected to see that the LBF framework is insufficient for the financing of urban developments, it should be seen as a method of additional financing – this is in line with Walters (2016) and Peterson (2009) about the applicability of LBF in terms of local government financing. The insufficiency is also related to the lack of additional taxes which a municipality could use for further sustainable development, especially Utrecht and Eindhoven mentioned this as restricting. This can be related to the literature, and is in line with the fact that local governments in the Netherlands have significantly less earning potential compared to local governments in equally decentralised nations in the EU (CBS, 2020). Building upon this, it can be speculated that a higher level of local income could make up for less subsidies from the national government.

How a municipality makes use of the framework is dependent on the municipal context, but also on a municipalities' market structure. For DO, it is highly relevant if the business case allows for plenty of margin, and that there are ample developments in order to finance relevant infrastructure. In turn, general economic developments influence the feasibility of the business case. This argumentation came forward in all municipalities, making it important when discussing DO usability and sustainability.

Influence by national government

The influence that the national government exerts on municipal urban development is large. In practice, all three municipalities are largely dependent on national government contributions. The literature suggested that investments would get too big for municipalities to carry out by themselves in the long term, and that area developments would be largely unprofitable for municipalities (Muñoz Gielen & Rheinfeld, 2016) (Stauttener & Boelman, 2021). But in practice, that moment seems to be here already. But this result is not completely unexpected, as Dutch municipalities in general are highly dependent on the national government for their day-to-day tasks (Ministerie van Financiën, 2022). This is also true for three cases themselves, and in line with the desk research (Ministerie van Algemene Zaken, 2022). For sustainable urban development additional money is needed. Incidental funds are necessary to make large one-time investments, while structural funds are needed to fund transitions and urban growth over a longer period of time. The urgency at which additional funds are needed depends on municipal ambitions and their financial situation. This is in line with Jongsma et al. (2021), whom state that structural budget issues are looming on the horizon of municipalities.

Additionally, the decentralisation is named as a hurtful development for municipalities, especially for Maastricht. This is also seen in the literature (Jongsma et al., 2021, 2022), where the decentralisations in the social domain are largely held responsible for the relatively bad financial situation of some municipalities. However, those sources did not mention the precise effect on sustainable urban development. But the empirical results show that decentralisation has had a negative effect on sustainable urban development.

Bargaining process

According to Negotiation Theory, trust is the most important factor in determining negotiation success (Kong et al., 2014). This is also reflected in the three case studies. The municipal negotiators mentioned that a lack of trust, and sometimes even a sense of distrust, was present during negotiations with property developers. Trust is heavily affected by information asymmetry in favour of the developers, this is in line with existing theory (Caputo, 2015). Contrary to the theory, the public officers did not seem to suffer from bounded rationality. However, this might be because self-reporting leads to a certain bias. Public officers seemed more critical of their colleagues compared to themselves. But bounded rationality was not named as an impeding variable during negotiations. Additionally, the literature suggested that cultural differences may influence negotiations (Gelfand & Brett, 2004). In practice, this has not been brought up as an influential factor in the bargaining process.

The negotiators mention that they are satisfied with the outcomes, but acknowledge that a certain degree of 'value' is always left on the table. This sentiment agrees with the theory on ZOPA (Zone of Possible Agreement), that no negotiation is perfect and that value will always be left on the table (Caputo, 2015). The theory does not mention capacity as being a success factor in negotiations, but

the empirical data shows that a lack of municipal capacity leads to less overall negotiations taking place, which puts pressure on the negotiators. However, it was mentioned that the skillset of municipal negotiators is key in successful bargaining in the three municipalities, this agrees with Holsen (2020). When this skillset was inadequate, colleagues had to take over or support the negotiator with additional knowledge. All in all, the empirical research results show no major discrepancies with Negotiation Theory, only slight differences and nuances can be noted.

The literature review on the theoretical implementation of DO also overlaps with negotiations, especially when it comes to certain tactics used by municipalities. The case studies have shown that the land use plan will be used as the primary negotiation tactic, as this is the most important public instrument the municipality has when confirming development plans. This is in line with literature from Muñoz Gielen & Tasan-Kok (2010), whom mention that amending land use plans can be seen as a leverage tool in negotiations.

Policy Process

The change from active to facilitating land policy is noticeable in all three municipalities, and is in accordance with the literature (Hendricks et al., 2021). This change in policy stems from the Advocacy Coalition Framework (Sabatier & Jenkins-Smith, 1988), as this change occurred surrounding the financial crisis in 2008 and can be seen as an external shock. However, the visible difference between adaptation to facilitating land policy is large. Eindhoven implemented the off-site infrastructure fund for DO, while Utrecht relies on negotiations. The literature mentions that having hard policy on negotiable developer obligations improves the DO implementation process (Muñoz Gielen & Lenferink, 2018). This research confirms this statement, as Eindhoven always receives DO, while municipalities which solely negotiate do not receive DO for all projects to the same degree. Also, it has been noted that policy decisions and considerations differ between municipalities. Eindhoven, Utrecht and Maastricht have different strategies and considerations for their DO implementation. The literature also mentions that municipal cost recovery policy can be confusing and unclear (Muñoz Gielen & Lenferink, 2018), but the results do not show this. The results do show that transparent and clear policy leads to a better understanding from developers as to why they have to contribute to off-site infrastructure, this is especially the case in Eindhoven. Additionally, clear and transparent policy ensures that there is certainty from both parties – the developer knows that a contribution has to be paid and can calculate this in potential land acquisition, while a municipality is guaranteed to receive contributions. This is in line with Muñoz Gielen & Tasan-Kok (2010). All of the observed cost recovery policy has been the result of top-down policy implementation. According to Matland (1995), top-down policy has the weakness of being too administrative and bureaucratic. This has not been observed in any of the municipalities. However, municipalities keep in mind developer's interest when creating policy, such as Eindhoven and their optimalisation of square meter contribution in favour of maximalisation.

Positive and negative influences on the policy process do not differentiate from Policy Implementation Theory (Cerna, 2013). However, there is one exception that is not easily classifiable into the existing framework, but can be classified as general incompetence. Namely: 'Policy stacking'. Policy stacking means that the municipality is too eager to realise policy goals, and demands too much from a developer. In turn this leads to rougher negotiations on other aspects of the development such as the business case and the contribution for off-site infrastructure. This phenomenon did not come forward in the literature study, but certainly has an effect on the policy process and the policy outcome.

Adaptation of the conceptual framework

After the results have been presented, it has become clear that there are additional variables that have come forward that influence the relationship between the use of developer obligations and sustainable urban development in Dutch municipalities. Therefore, the conceptual framework has been adapted to also include a new moderating variable: 'Market structure'.

Market structure is an umbrella term for: (1) the business case of developments, (2) demographic developments, and (3) economic developments. Throughout the interviews it has become clear that DO is dependent on the margin of a development project, and the potential contribution competes with the implementation of other policy goals. Next to the bargaining process and policy process in a municipality, the municipalities' market structure determines how well DO can be utilised for sustainable urban development.

Each municipality is different, and has a different market structure. The business case of a development project determines the initial margin that a developer has left for contributions and policy realisation. This is heavily dependent on the housing programme, as free-sector housing will allow for more DO contribution than social housing because of the bigger margin. The municipalities' ambitions and needs determine the housing programme. In turn, the needs of the municipality are largely decided by demography; pull-factors and the influx of potential new residents in the municipality. A municipality with a growing population and an influx from immigration will develop more houses, allowing for a larger potential DO contribution. This difference is visible when comparing Eindhoven and Utrecht to Maastricht. Maastricht intends to develop significantly less houses, which also happen to fall into the social category. As a consequence, less or zero contributions per house can be collected by Maastricht. In Eindhoven and Utrecht, the influx of new residents is larger – allowing for more diverse housebuilding and potential DO contribution to use for sustainable urban development. This relationship has been visible in all three municipalities.

Economic developments that have been encountered that influence the process of sustainable urban development in three case studies are: (1) The labour shortage, (2) inflation, (3) rising building costs and (4) supply chain delays. These developments influence the margin of the business case, and can cause delays for the developer. If the margin shrinks, less potential DO can be used for further sustainable urban development. Additionally, economic developments will influence markets in a different way. The development of housing prices differs per municipality and region (CBS, 2022c). Municipalities with a higher market price for houses will be able to facilitate a business case with potentially more margin.

Additionally, the conceptual framework in paragraph 2.3 indicated that the national government directly influences the practical implementation of developer obligations. The results have shown that this relationship is non-existent in the three municipalities, and that the national government influences the practical implementation of developer obligations through the LBF framework and corresponding legislation. The results did not indicate that a direct relationship between the government and the use of DO exist in any municipality. However, the direct influence of the government on municipal sustainable urban development, through subsidies, has been observed in all three municipalities, which is why the relationship in the conceptual model will be adapted accordingly. The national government directly influences the LBF framework, as well as sustainable urban development in Dutch municipalities. The old and new conceptual framework will be presented below. The old conceptual framework will be shown below in figure 7, the new one in figure 8.

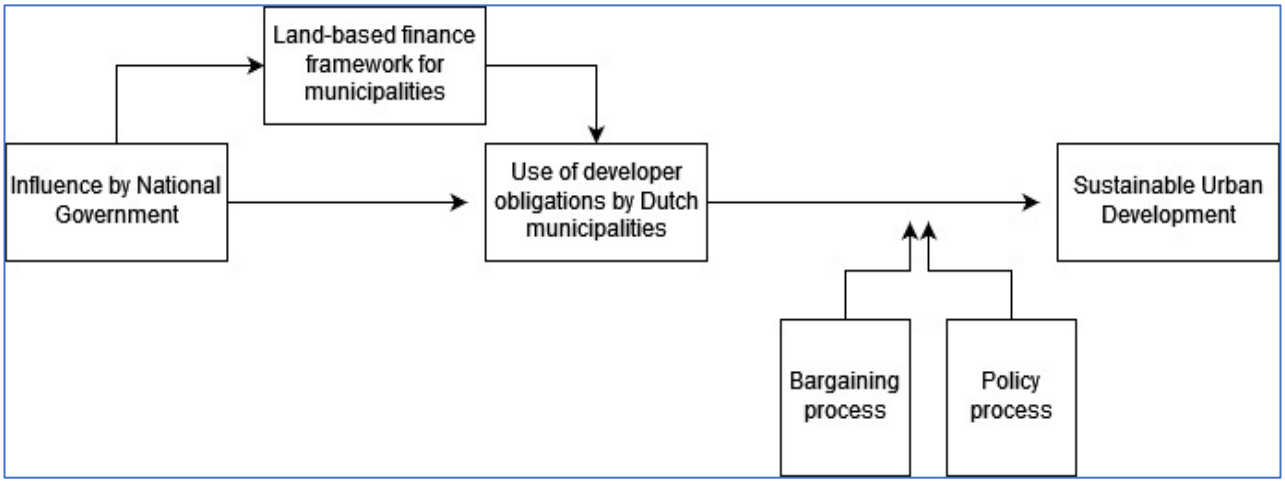

Figure 7: Old conceptual framework before research findings.

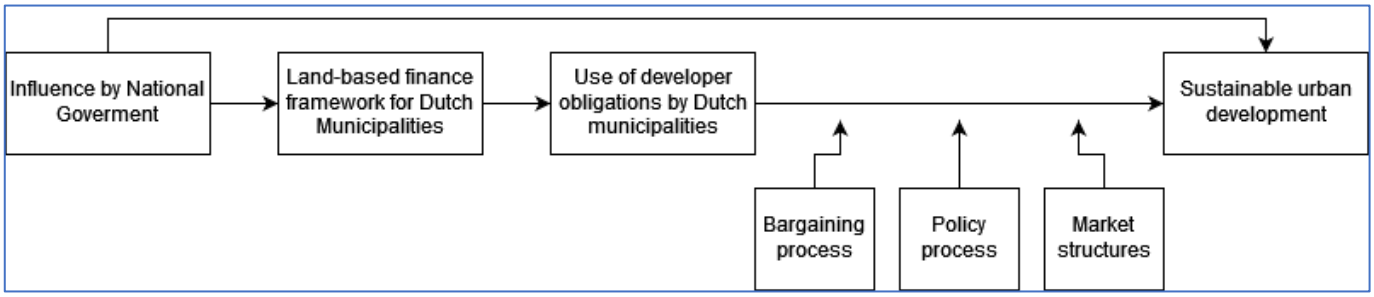

Figure 8: New conceptual framework adapted after research findings.

6. Conclusion, recommendations and reflection

6.1 Conclusion

This qualitative research focused on answering the following main research question: *'To what extent is the current land-based finance method of developer obligations sustainable enough to ensure and promote sustainable urban development for Dutch municipalities in practice?'*

The main research question was divided into three sub questions.

1. *How do Dutch municipalities use developer obligations as a land-based finance method in practice?*
2. *To what extent can Dutch municipalities reach their sustainable urban development goals using developer obligations and the existing financial framework?*
3. *What factors influence the usability of developer obligations to promote sustainable urban development in Dutch municipalities?*

In order to draw a thorough conclusion and answer the main question, all sub questions will have to be answered first.

Through analysing the interviews, it has become clear that in terms of financing off-site infrastructure, the practical implementation of DO as a land-based finance method showed significant differences per municipality. In this regard, the presence of hard DO policy is the leading factor when it comes to structurally garnishing contributions. Eindhoven and her fixed off-site contribution fund always recover off-site costs, while Utrecht depends solely on negotiations and does not recover costs for smaller developments. Maastricht, on the other hand, does not use DO for off-site infrastructure financing, because this method has proven to be non-viable due to the small margins in the local business cases in comparison to the investment tasks. DO for on-site costs are recovered in all three municipalities, while planning costs cannot be fully recovered in Maastricht due to the complexity of inner-city area developments, as well as unclear expectations from both the developer and the municipality. Thus, the practical implementation of DO greatly differs between the three municipalities. Furthermore, all three municipalities strongly indicate that the use of DO is correlated with the realisation of other policy ambitions in urban development projects. It is essential to find the balance between a developers' financial contribution and additional policy goals which a developer can realise. The interviewees from all three municipalities noted that policy goals for individual projects such as affordability, sustainability, and quality matter more than maximising financial contributions for additional off-site infrastructure. Therefore, all three municipalities strive for optimal cost recovery instead of maximum cost recovery using the DO method.

DO and municipalities' existing financial framework can be used to finance sustainable urban development goals. However, the degree to which this is possible differs greatly between the municipalities. The general consensus in all municipalities is that DO is not sufficient as a lone financing method, but should be used as a financial supplement. All three municipalities state that developers cannot be expected to pay for entire off-site amenities or large public infrastructure because the existing city also benefits from additional off-site infrastructure. Therefore, municipalities must find alternative financing methods, in order to make up for the differences. In practice, however, the municipalities expect the national government to contribute significantly, as they cannot afford the sustainable development investments themselves in the long run. Transitions regarding energy use, infrastructure development, mobility, and climate adaptation require significant governmental contributions. According to Maastricht, these contributions, in the shape of

subsidies and additional funding, are coupled with strict criteria which often favour municipalities experiencing urban and demographic growth. This is something that Maastricht considers to be problematic and unfair. Furthermore, the existing land-based finance framework favours Eindhoven and Utrecht, as they make use of active land policy for certain greenfield developments. Maastricht does not have this ambition, nor the capacity to utilise active land policy, further adding to their financial stress while in pursuit of developing sustainably. Financial stress is felt in all three municipalities, but less so in municipalities where government subsidies are attainable and where the land-based finance framework can be applied more broadly. Yet, according to the municipalities' ambitions, sustainable urban development is only possible with significant contributions from the national government.

The research has shown that the usability of DO for sustainable urban development is influenced by three main factors. Firstly, the bargaining process surrounding DO suffers from multiple hindrances. The most prevalent being information asymmetry, which leads to a lesser degree of trust, dragged-out negotiations and a lower potential for cost recovery. Information asymmetry about a developer's financial position and building costs are most common. Additionally, the negotiation outcome is negatively affected by inadequate municipal capacity, imbalanced power relations, and a lack of transparency. Therefore, an imperfect bargaining process can lead to a lesser degree of DO, which means that less supplementary funds can be used for additional sustainable urban development goals. The imperfect bargaining process can also lead to less policy ambitions being realised in the development itself, hampering sustainable urban development in the short and long term.

Secondly, the policy process has an effect on the relationship between DO use and sustainable urban development. The three municipalities have displayed different degrees of adaptation to the widespread change from active to facilitating land policy. Facilitating land policy allows for less value capturing and cost recovery, and the contribution from developers is largely dependent on the type of DO policy that is used by a municipality. 'Hard' DO policy regarding off-site infrastructure gathers more contributions than 'soft' DO policy focused purely on negotiations, mostly due to increased transparency and certainty about contributions. Moreover, the interviews have shown that all three municipalities have trouble with finding the balance between policy ambitions and DO. Due to being too ambitious or not finetuning inter-organisational communication, too many policy ambitions are asked from a developer, known as policy 'stacking'. This leads to friction about financial feasibility of the development, and in turn leads to the worsening of information asymmetry and trust, which is damaging to sustainable urban development.

Thirdly, the research has shown that a municipalities' market structure determines whether the DO method is locally applicable and beneficial. Developments surrounding the economy, demography, and the local business cases largely determine whether a developer has sufficient margin to contribute to additional DO. Economic developments such as the current inflation, rising building costs, labour shortage, and supply chain issues put a strain on a developer's business case, lowering the margin for potential DO contribution in all three municipalities. Additionally, demographic growth and the creation of more housing will lead to more potential DO contributions, but will also lead to a higher demand for new infrastructure. The connection between the economy, new developments, and the need for more infrastructure was noted by all three municipalities.

Finally, the main research question can be answered: *'To what extent is the current land-based finance method of developer obligations sustainable enough to ensure and promote sustainable urban development for Dutch municipalities in practice?'*

It can be concluded that the sustainability of the DO method for sustainable urban development differs for each municipality. The market structure of the municipality decides whether this method

is applicable for financing sustainable urban development, while a municipalities' handling of the policy and bargaining process determines how successful DO implementation can be on a city scale level. Currently, the DO method is mainly used as a partial financing method for off-site infrastructure, as the method on its own is insufficient in the observed municipalities. In addition, the DO method is susceptible to economic developments. Therefore, its sustainability differs when considering from a short- and long-term perspective. In the short term, aforementioned economic developments strain DO and hamper the financing of sustainable urban development projects, due to a decline in the margin of business cases. Currently, the municipalities strongly expect negative effects on sustainable urban development and potential DO due to the negative economic developments. Contrastingly, in the long run, interviewees expect economic imbalances to flatten out, making the DO method more sustainable. Additionally, the need for DO for off-site infrastructure is correlated with urban growth. The demand for new residential developments determines the need for additional off-site infrastructure. This correlation was observed in all three municipalities and is the primary reason why the results point to this method being relatively sustainable as long as the municipality keeps growing. After all, a municipality with no growth has less demand for additional large infrastructure. This makes the DO method a relatively unsustainable financing method for municipalities with a slowly growing, stagnating or decreasing population. However, in order to truly promote sustainable urban development in Dutch municipalities, alternative financing sources such as subsidies from the national government, are necessary in order to carry out municipal sustainable urban development ambitions.

6.2 Recommendations

Based on the findings of this study, recommendations can be made for praxis and future research.

Praxis

Firstly, the results have shown that Eindhoven always receives DO contributions based on their hard off-site policy in the form of a fund. The interviewees were positive about its implementation and widespread application in the municipality. Implementing a similar policy in other municipalities will allow them to make better use of DO than with regular negotiations, as is the case in Utrecht, where smaller developments do not contribute to off-site costs. A fixed contribution per square meter of added residential or industrial development is transparent and understandable for the developer and the municipality itself. This will ensure less strain on negotiations regarding off-site cost recovery.

Secondly, in order improve cost recovery for planning costs, this research stresses a revision of the *plankostenscan* by the national government, as the current method does not allow full recovery of planning costs in Maastricht, and partially in Eindhoven due to complex inner-city developments. Especially with the upcoming Environment and Planning Act (Omgevingswet) which stresses citizen participation that prolongs the planning process even further, potentially making planning costs even more expensive.

Thirdly, this research recommends that the practice of policy 'stacking' should be minimised in order to promote sustainable urban development. The stacking of policy ambitions can lead to developers questioning the financial feasibility of their development, even if this is unwarranted. This fuels a lack of trust and more information asymmetry. In order to combat policy stacking, more inter-organisational communication is needed between policy departments prior to the negotiation process. Guidelines and ambitions should be clear before negotiating with a developer. This ensures more transparency and a collaborative negotiation front on behalf of the municipality.

The last recommendation for praxis is to appoint government subsidies for local sustainable urban development based on challenges, decoupled from urban growth. In practice, municipalities such as Maastricht have important investment challenges in off-site infrastructure which they are unable to afford. Subsidies are denied due to a lack of urban growth. Cities such as Maastricht cannot use DO for additional financing and are more dependent on subsidies. Making these subsidies accessible for municipalities with a similar market structure will allow them to develop more sustainably in the long run using incidental government contributions.

Further research

Based on this research there are still some suggestions for further research.

Even though the sample size of case studies is small (3), the implementation of the DO method turned out to be entirely different between the municipalities. Future research based on more case studies in other parts of the Netherlands might yield different or similar results.

Based on the results, it has become clear that cost recovery for off-site infrastructure is a process of balancing financial contributions and policy goals. The results have shown that all three municipalities do not maximise cost recovery in return for more realisable policy ambitions in the area development project. Future research can focus on quantifying the difference between optimal and maximum cost recovery by mapping which policy ambitions influence this balance the most. By doing this on a larger scale the negotiation and policy process for municipalities becomes more methodological and quantifiable. This future research can directly address the complaints made by several public officers that the negotiation process requires too much guesswork regarding the influence of certain policy ambitions on a development project, and its impact on cost recovery.

This research pointed out that Maastricht, the municipality with the weakest market structure, came across as hopeless when it comes to financing sustainable urban development. Both the lacking LBF framework and inaccessible government subsidies were deemed as problematic. Therefore, it is important to research if this phenomenon is visible in other cities in the Netherlands as well, as sustainable urban development also needs to happen in urban areas where financing off-site infrastructure is relatively hard. Additionally, research needs to be done how to provide similar municipalities with a stagnating, declining or slowly growing population with additional (LBF) financing methods that can help fund sustainable urban development at a local scale.

6.3 Reflection

In this paragraph a reflection will be given regarding the validity, reliability, limitations and the research process. This reflection is not the same as the discussion of the results, which already has been carried out in paragraph 5.7. Therefore, this reflection does not contain a reflection on the results.

Validity and Reliability

The concepts of validity and reliability have been generally discussed in paragraph 3.3. This reflection will illustrate to which extent the research has been proven to be viable and reliable.

The internal validity of the research has been guaranteed by operationalising variables and concepts into observable constructs. This is shown in appendix 8.2, the operationalisation matrix. According to van Thiel (2014), operationalising concepts adds to the internal validity. Next to that, the

presupposed theoretical relationship between the variables, based on literature and theory, has been observed and proven in the research. The adaptation of the conceptual model is primarily related to the addition of the variable 'market structures'. The adaptation did not require to change the entirety of the relationships between most variables. Therefore, the internal validity has been guaranteed.

The external validity is related to the generalisability. Because this is a qualitative case study research, the results can vary per municipality. Each municipality has their own way and methods surrounding policy, bargaining and DO considerations. Next to that, every municipality has specific market structures and challenges regarding sustainable urban development. Generalisation for every municipality is not possible based on this research, but the results can be utilised for municipalities with strong similarities. But generalisation has never been the primary goal of this research. In-depth knowledge creation surrounding DO use and sustainability was the goal, and has been reached. Additionally, clarity about practical DO use and the sustainability of this LBF method in three Dutch municipalities can provide a stronger knowledge base for additional research and theory development or adjustment.

The reliability of the research is partly related to the accuracy of the measuring instrument, which in this case is the interview guide. By basing the interview guide on the operationalisation matrix, the content is based on literature and theory. Additionally, both the operationalisation matrix and the interview guide have been peer-reviewed before applying them in practice. Next to that, the first rounds of interviews yielded good results without issues regarding interview questions, structure or length. This indicates that the measuring instrument is well suited for gathering the necessary data. Therefore, the data has a relatively high degree of accuracy. It is also worthwhile to mention that the data analysis using ATLAS.TI utilises codes that are based on the operationalisation matrix as well. In turn, the data analysis and the analysis instrument are more accurate thanks to peer-reviewing.

The repeatability of the research is also important, but the true repeatability of the research can only be found out when repeating the research and comparing the results. In practice there is no time for that. Van Thiel (2014) mentions that instruments should be peer-reviewed during the process, as well as that the research benefits from regular feedback to ensure a higher degree of repeatability, which has been the case for this research.

Lastly, triangulation plays a role in the validity and the reliability of the research. Based on Hales (2010), triangulation has been realised in this research in the following forms: (1)Data triangulation. Varied sources have been used to create the measurement instruments, in order to apply varied points of views by different scholars. In the study, several references were made to similarities or discrepancies with previously found literature. (2) Investigator triangulation, this has been applied in the form of peer-reviewing measurement instruments and receiving regular feedback from a supervising researcher. (3) Theory triangulation has also been applied, as two different theories have been included in the research. During the research and data analysis process it turned out that the two theories strengthened each other, as DO implementation is a matter of policy and negotiations. The research would have been weaker if one theory would have been left out.

Limitations

After the research has been completed, it is clear that there are some limitations.

This research has a clear interviewee target group. Namely, professionally relevant Dutch public officers from Maastricht, Utrecht and Eindhoven. This is the intended target group in order to answer the research question. However, the research could have taken on a wider scope if developers and

researchers would be interviewed as well. This way, the statements made by public officers could have been placed in their perspective, negating potential bias and providing a new outlook on the results. But due to the limited timeframe this has not been possible.

Some interviews had to be carried out with two or three interviewees at the same time due to time and planning constraints from the municipalities' side. While the interviews were high quality and filled with relevant information, the dynamic between interviewees can lead to suboptimal interview scenarios. During one interview it became clear that one interviewee talked significantly more. Potentially, this problem arose because the interviewees in question were colleagues, and the verbally dominant interviewee had a managerial role in their team. A power difference between the interviewees caused one interviewee to talk less. In order to let the interviewees speak for themselves, one-on-one interviewees are preferable. But for this research there was no other option in some cases. A course of action can be to ask the interviewee in question for his/her opinion, or ask questions directly to the verbally subservient interviewee.

Lastly, a limitation of this qualitative research is that the effects of the variables on the relationship between DO use and sustainable urban development cannot be quantified. That matter is beyond the scope of the qualitative research method, but would provide a more detailed overview of the relationships between the variables.

Research process

After completing the research and writing the thesis, it is appropriate to briefly reflect on the research process.

Locating, approaching and making appointments with interviewees has been strenuous due to the ongoing COVID-19 pandemic. As working from home has been the norm over the past half year, it is not possible to walk into a city hall in order to speak with potential interviewees. All contact required many e-mails to be sent, this took up a lot of valuable time and often did not bear fruit. Luckily, plenty of interviews have been held to ensure saturation. Overall, the data collection and analysis process happened in a timely manner, with no significant problems regarding planning.

During the interviews it became clear that many professions in a municipality overlap, but have certain specialities. Ample preparation was needed in order to prepare for the interviews. Because there is one main interview guide that has been used as a guideline for all interviews, asking probing questions was key. In practice, this has provided insight about the variety of specialities within policy departments of municipalities.

Lastly, it is important to discuss the research timeframe and personal experience. It has taken roughly half a year of intensive work in order to design, write and finalise this research. Despite good supervision, the ongoing pandemic and working from home can negatively influence the research process. Discipline is required to negate this effect, which can be quite a challenge when having 'screen fatigue' due to working from home. Looking back, consistent planning and clear agreements with the supervisor have helped with maintaining discipline and a consistent workflow.

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8. Appendix

8.1 Interview guide

Date and timeslot:
Interview location / software:
Organisation of interviewee:
Profession of interviewee:
Respondent number: (Organisation + #X)

Introduction
Thank you for participating in this interview. I am Corné Brouwers, and for my Master's degree in Spatial Planning at Radboud University I am conducting this research.
I am researching financing methods of spatial developments in urban areas. Specifically, I am researching the practical application of developer obligations and contributions to spatial developments by project developers in the exploitation plan and in the anterior agreement. Previous research has shown that this method is applied by every municipality, but that by no means all costs are recovered from the developer. Because Dutch municipalities are facing financial stress and growing challenges, I will investigate: (1) how exactly the practical implementation of this financing method works in urban municipalities, (2) whether urban municipalities still have the financial capacity for (sustainable) urban development using this financing method, and (3) how the financing method should be improved for further use in the future. For this purpose, I investigate three cases (urban municipalities): Maastricht, Eindhoven and Utrecht.

The interview questions are based on theory and literature review. The interviews with civil servants will be used to gain insight into the practical functioning of the case when it comes to previously mentioned topics. As it concerns qualitative research the opinion of the civil servant is key.

Consent audio recording
The audio of the interview will be recorded for further data analysis, do you agree?

-------Start Audio Recording-------

The audio recordings will not be shared publicly, only my supervisor and I will have access to the data. You will remain anonymous in the study. May I share your job title in the research though?

You may stop the interview at any time, and you must indicate it if you would not like to answer a question for any reason. Shall we begin?

Introduction and icebreaker

1. What position do you hold within the municipality and what do you have to do with urban development and its financing?

Sub question 1: How do Dutch municipalities use developer obligations as a land-based finance method in practice?

2. What role do developer obligations play in sustainable urban development in the municipality?
3. In what situation is the decision made to ask for developer contributions? And what factors influence this?
4. How do municipalities determine the content of an anterior agreement / contributions plan? (Who, when, is this set in policy?)
5. What are the most important considerations made when asking developer contributions?

Bargaining process

6. To what extent are there negotiations with developers about the contents of the anterior agreement?
7. How are these negotiations going in practice? Where are they going well, and where are they going less well? (Trust, information asymmetry)
8. Do public officials have sufficient knowledge, capabilities and rationality to negotiate cost recovery with developers?
9. What are the main challenges when it comes to negotiating with developers?
10. Do you feel that the maximum cost recovery is achieved? (there is nothing extra to be gained) (Leaving value on the table)
11. Do negotiations often turn out positively or negatively for the municipality?
12. Does one particular party often prevail during negotiations? If yes - which one? If no - why not?

Policy Process

13. The municipality has policies regarding cost recovery. Does the actual cost recovery deviate from the policy? Why is that?
14. Does policy work in favour of cost recovery, or does policy deter potential developers because of all the requirements?
15. Do public officers have sufficient knowledge, capabilities and skills to adapt within changes from active to facilitating land policies?
16. Are the skills of officials sufficient to successfully implement and execute policies in Municipality X?
17. Does the municipality have sufficient capacity to adequately implement all policy goals? If not, why? If yes - what makes it possible in municipality X?

Sub question 2: To what extent can Dutch municipalities reach their sustainable urban development goals using developer obligations and the existing financial framework?

18. Does the municipality suffer from financial stress? What is the reason for this and how is it visible in the spatial domain?
19. Are developer contributions sufficient to cover area-specific / on-site costs in urban developments?
20. Long-term developments will require large investments in off-site facilities / infrastructure. To what extent can this be financed by developer contributions in Municipality X? (and is it sufficient?)
21. What happens if off-site facilities / infrastructure are needed but developer contributions are not sufficient? (What are the implications for: the project, the surrounding area, policy objectives)
22. With recent economic developments in mind (high inflation, construction cost increases), are developer obligations really a stable source of funding?
23. How willing is the municipality to take risks when it comes to urban developments, such as off-site facilities / infrastructure, if there are not sufficient contributions from developers?
24. With the decrease of active land policy, is equalization between loss-making and profitable area developments still possible? (In other words, are there enough reserves to absorb potential losses?)

Sustainable Urban Development Goals

25. The municipality has policy goals when it comes to housing, green space and the environment. Can these be achieved with the current financial resources? (why or why not?)
26. Does cost recovery weigh on the sustainability aspects of urban development? (Can developers, because of all the requirements, contribute enough?)
27. Does the municipality's financial situation threaten not to implement / delay sustainable urban development?
28. Does the municipality have sufficient tools to ensure sustainable urban development in these times of increasing tasks and financial stress?
29. With all this in mind, is this method of financing (developer contributions) sustainable in the long run to achieve sustainable urban development? (Why yes/no?)

Sub question 3: To what extent does the current implementation of developer obligations within the financial system require improvements for Dutch municipalities?

Land-based finance framework for municipalities

30. What do you think could be improved when it comes to the implementation of developer obligations within the municipality? Who should be responsible for making these changes?
31. What could be improved when it comes to negotiating cost recovery with developers?
32. What could be improved with the policy around cost recovery and its implementation?
33. Many tasks have been decentralized, while the funding of the municipality is largely centralized. Should municipalities have more ways to generate their own revenue?

Influence by national government

34. What facets of cost recovery need to be changed to improve the entire system in practice?
35. Should the overall financial system for municipalities be changed? Why? What adjustments are desirable?
36. Is the state doing enough to provide municipalities with resources to enable sustainable urban development?
37. Is the state responsible for the financially weaker position of Dutch municipalities? What is the reason for this (not?)

Ending

Thank you for participating in this interview. Do you have any feedback that I can use to improve upcoming interviews? If possible, could I ask further questions via e-mail if I happen to have them later on?

-------End Audio Recording-------

8.2 Operationalisation Matrix

Together, the tables below make up the operationalisation matrix. Due to formatting issues, zooming in is necessary in order to read the small text. The operationalisation matrix displays the concepts, variables, sub variables and indicators stemming from literature and theory. This document has been used to create the interview guide for data collection, as well as the coding scheme for the data structuration and analysis.

Dimension/Concepts	Variable	Sub variable	Indicator	Academic source - Inspiration	Empirical data source	Interview questions
Influence by National Government	National influence on financial framework	National depedency	Sufficiency of national financeering	(Muñoz Gielen & Rheinfeld, 2016)	Interviews	Is the municipality reliant on national funding for its urban developments? How are national funds used for urban developments?
			Financial depedency on national government	Muñoz Gielen & Rheinfeld (2016)	Interviews	Can urban development projects be realised without additional funding from national sources? If so - what kind can, what kind cannot? Is the state responsible for the financially weaker position of Dutch municipalities? What is the reason for this (not?)
			Financial stress / pressure	Verstraten, Ruijven & Euwals (2019)	Interviews	Does the municipality suffer from financial stress? What is the reason for this and how is it visible in the spatial domain?
		Local autonomy	Sufficiency of local financeering	Peterson (2009), Muñoz Gielen & Van der Krabben (2019)	Interviews	Are local financial methods sufficient for realising urban developments?
			Means to generate local revenue	Peterson (2009), Muñoz Gielen & Van der Krabben (2019)	Interviews	Does the municipality have enough means to generate own revenue? Would this be preferable in a decentralised nation?
Land-based finance framework for municipalities	Influence of the available framework on municipal finance		Sufficiency of land-based finance methods	Peterson (2009) / Muñoz Gielen & Van der Krabben (2019)	Interviews	Are the available land-based finance methods the municipality has sufficient for sustainable urban development?
	Improvements for land-based finance framework	National scale	Improvements - Cost Recovery	Stauttener & Boelman (2021)	Interviews	What facets of cost recovery need to be changed to improve the entire system in practice?
			Improvements - Financial System	Camagni (2016)	Interviews	Should the overall financial system for municipalities be changed? Why? What adjustments are desirable?
			Improvements - Sustainable Urban Development	Stauttener & Boelman (2021)	Interviews	Is the state doing enough to provide municipalities with resources to enable sustainable urban development?
Use of DO's by Dutch municipalities	Considerations for DO	Reasoning behind DO use and application	Thought process behind DO 'rationale'	Muñoz Gielen en Lenferink (2018)	Interviews	In what situation is the decision made to ask for developer contributions? And what factors influence this? + What are the most important considerations made when asking developer contributions?
			Necessity of DO's	Muñoz Gielen en Lenferink (2018)	Interviews	What role do developer obligations play in sustainable urban development in the municipality? (very dependent, or much active land policy?)
			Role of DO's	Muñoz Gielen en Lenferink (2018) / Hendricks et al. (2021)	Interviews	What role do developer obligations play in sustainable urban development in the municipality? (very dependent, or much active land policy?)
					Interviews	
	Contents of DO	Value capturing	The ability to maximize value capture with DO	Caputo (2015) / Muñoz Gielen en Van der Krabben (2019)	Interviews	Do you feel that the maximum cost recovery is achieved in your municipality? (there is nothing extra to be gained) (Leaving value on the table)
		Content Creation	Municipal decisions on DO content	Muñoz Gielen & Van der Krabben (2019) / Hendricks et al. (2021)	Interviews	How do municipalities determine the content of an anterior agreement / contributions plan? (Who, when, is this set in policy?)
	Practical implementation of DO	On-site infrastructure	Suffiency of DO	Muñoz Gielen & Rheinfeld (2016) / Muñoz Gielen en Lenferink (2018)	Interviews	Are developer contributions sufficient to cover area-specific / on-site costs in urban developments?
		Off-site infrastructure	Suffiency of DO	Muñoz Gielen & Rheinfeld (2016) / Muñoz Gielen en Lenferink (2018) / Hendricks et al. (2021)	Interviews	Long-term developments will require large investments in off-site facilities / infrastructure. To what extent can this be financed by developer contributions in Municipality X? (and is it sufficient?)
			Insufficiency of DO	Sorel et al. (2014)	Interviews	What happens if off-site facilities / infrastructure are needed but developer contributions are not sufficient? (What are the implications for: the project, the surrounding area, policy objectives)
			Insufficiency of DO - Risk	Verstraten, Ruijven & Euwals (2019)	Interviews	How willing is the municipality to take risks when it comes to urban developments, such as off-site facilities / infrastructure, if there are not sufficient contributions from developers?
			The possibility for cost equalisation	Stauttener & Boelman (2021)	Interviews	With the decrease of active land policy, is equalization between loss-making and profitable area developments still possible? (In other words, are there enough reserves to absorb potential losses?)
	Improvements for DO implementation and execution	Municipal Scale	Improvement - General Implementation	Muñoz Gielen en Lenferink (2018)	Interviews	What do you think could be improved when it comes to the implementation of developer obligations within the municipality? Who should be responsible for making these changes?
			Improvement - Negotiations	Muñoz Gielen en Lenferink (2018) / Holsen (2020)	Interviews	What could be improved when it comes to negotiating cost recovery with developers?
			Improvement - Policy Implementation and Change	Muñoz Gielen en Lenferink (2018) / Stauttener & Boelman (2021)	Interviews	What could be improved with the policy around cost recovery and its implementation?

Bargaining process	Negotiation process	Amount of negotiations	Negotiation frequency	Muñoz Gielen en Van der Krabben (2019)	Interviews	To what extent are there negotiations with developers about the contents of the anterior agreement?
		Information asymetry	Hindrance in process	Caputo (2015) / Holsen (2020)	Interviews	How are these negotiations going in practice? Where are they going well, and where are they going less well? (Trust, information asymmetry)
		Rationality	Hindrance in process	Caputo (2015) / Holsen (2020)	Interviews	How are these negotiations going in practice? Where are they going well, and where are they going less well? (Trust, information asymmetry)
		Stakeholder positioning	The ability to recognize bargaining relations	Caputo (2015) / Holsen (2020)	Interviews	Do negotiations often turn out positively or negatively for the municipality?
		Influence on DO content	The ability to change the outcome through agreement	Caputo (2015) / Holsen (2020)	Interviews	Do negotiations often turn out positively or negatively for the municipality?
		Trust	Hindrance in process	Lewicki & Polin (2013)	Interviews	How are these negotiations going in practice? Where are they going well, and where are they going less well? (Trust, information asymmetry)
	Municipal capacity	Available knowledge / skills	Having capabilities to negotiate	Fisher et al. (1991) / McCarty & Hay (2015)	Interviews	Do public officials have sufficient knowledge, capabilities and rationality to negotiate cost recovery with developers?
		Available staff	Having enough officers to negotiate	Matland (1995) / Cerna (2013)	Interviews	Does the municipality have enough capacity to negotiate with developers?
Policy Process	Policy Change	Adaptability	The ability to deal with policy change	Gornitzka et al. (2005)	Interviews	Do public officers have sufficient knowledge, capabilities and skills to adapt within changes from active to facilitating land policies?
	Policy Implementation	Success factors	The ability to implement policy succesfully as a municipality	Gornitzka et al. (2005) / Cerna (2013) / Muñoz Gielen en Lenferink (2018)	Interviews	Does the municipality have sufficient capacity to adequately implement all policy goals? If not, why? If yes - what makes it possible in municipality X?
		Implementor's characteristics	The abilities of the policy implentor	Cerna (2013) / Muñoz Gielen en Lenferink (2018)	Interviews	Are the skills of officials sufficient to successfully implement and execute policies in Municipality X?
		Policy deviation	The ability to control cost recovery outcome	Muñoz Gielen en Lenferink (2018) / Muñoz Gielen en Van der Krabben (2019)	Interviews	The municipality has policies regarding cost recovery. Does the actual cost recovery deviate from the policy? Why is that?
		Policy deterrence	Policy effect on developers	Hendricks et al. (2021)	Interviews	Does policy work in favour of cost recovery, or does policy deter potential developers because of all the requirements?
Sustainable Urban Development (SUD)	Implementation of SUD policy	Implementation Challenges	Insuffiency of finance	Stauttener & Boelman (2021)	Interviews	The municipality has policy goals when it comes to housing, green space and the environment. Can these be achieved with the current financial resources? (why or why not?)
			Economic Developments	Stauttener & Boelman (2021)	Interviews	With recent economic developments in mind (high inflation, construction cost increases), are developer obligations really a stable and sustainable source of funding?
			Developer Pressure	Verstraten, Ruijven & Euwals (2019)	Interviews	Does cost recovery weigh on the sustainability aspects of urban development? (Can developers, because of all the requirements, contribute enough?)
			Postponements	Verstraten, Ruijven & Euwals (2019) / Hendricks et al. (2021)	Interviews	Does the municipality's financial situation threaten not to implement / delay sustainable urban development?

Table 10: Operationalisation matrix. (Own table, inspiration sources listed in the matrix)

8.3 ATLAS.TI Codebook

Below, the codebook is displayed. All 47 codes (left) are divided into 7 different code groups (right). Bar charts indicate which codes appear more frequently.

Search Entities

Name	Grounded	Density	Groups	Created by
Alternative Financing Off-site Infra	15	0	[Use of DO Dutch Municipalities]	Corné Brouwers
Bargaining - Capacity	19	0	[Bargaining Process]	Corné Brouwers
Bargaining - Hindrances	50	0	[Bargaining Process]	Corné Brouwers
Bargaining - Improvements	16	0	[Bargaining Process]	Corné Brouwers
Bargaining - Other	24	0	[Bargaining Process]	Corné Brouwers
Bargaining - Outcome	27	0	[Bargaining Process]	Corné Brouwers
Bargaining - Relations	35	0	[Bargaining Process]	Corné Brouwers
Bargaining - Skills / Knowledge	27	0	[Bargaining Process]	Corné Brouwers
Business Case Developments	47	0	[Market Structures]	Corné Brouwers
Cost Recovery - Maximum	7	0	[Use of DO Dutch Municipalities]	Corné Brouwers
Cost Recovery - Optimal	22	0	[Use of DO Dutch Municipalities]	Corné Brouwers
Demographic Developments	17	0	[Market Structures]	Corné Brouwers
DO Creation - Considerations	38	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Creation - Necessity	8	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Creation - Role of DO	15	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - General insufficient	13	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - General sufficient	4	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - Off-site	28	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - Off-site suffiency	14	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - On-site	12	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - On-site sufficiency	9	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - Other	27	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Implementation - Sustainability	13	0	[Use of DO Dutch Municipalities]	Corné Brouwers
DO Improvements	41	0	[Use of DO Dutch Municipalities]	Corné Brouwers
Economic Developments	30	0	[Market Structures]	Corné Brouwers
LBF Framework - Application	25	0	[LBF Framework Municipalities]	Corné Brouwers
LBF Framework - Improvements	9	0	[LBF Framework Municipalities]	Corné Brouwers
LBF Framework - Insufficient	19	0	[LBF Framework Municipalities]	Corné Brouwers
LBF Framework - Sufficient	4	0	[LBF Framework Municipalities]	Corné Brouwers
Nat. Influence - Financial Dependency	27	0	[Influence National Government]	Corné Brouwers
Nat. Influence - Legislation	24	0	[Influence National Government]	Corné Brouwers
Nat. Influence - Negative	34	0	[Influence National Government]	Corné Brouwers
Nat. Influence - Positive	3	0	[Influence National Government]	Corné Brouwers
Nat. Influence - Urban Development	22	0	[Influence National Government]	Corné Brouwers
Policy - Adaptation	13	0	[Policy Process]	Corné Brouwers
Policy - Capacity	25	0	[Policy Process]	Corné Brouwers
Policy - Deterrence	17	0	[Policy Process]	Corné Brouwers
Policy - Deviation	11	0	[Policy Process]	Corné Brouwers
Policy - Improvements	27	0	[Policy Process]	Corné Brouwers
Policy - Other	10	0	[Policy Process]	Corné Brouwers
Policy - Practical Implementation	42	0	[Policy Process]	Corné Brouwers
Policy - Skills / Knowledge	11	0	[Policy Process]	Corné Brouwers
SUD - Challenges	40	0	[Sustainable Urban Development]	Corné Brouwers
SUD - Financial Stress	29	0	[Sustainable Urban Development]	Corné Brouwers
SUD - Negative Impact	33	0	[Sustainable Urban Development]	Corné Brouwers
SUD - Positive Impact	10	0	[Sustainable Urban Development]	Corné Brouwers

Figure 9: Atlas.ti codebook

8.4 Introduction to the case study areas

This paragraph will introduce the three case study areas in this research. The main goal of this paragraph is to display relevant information from public sources in order to function as a supplement for the empirical research results in chapter 5. As mentioned in the methodology, the cases that will be studied are not to be analysed holistically. Only relevant aspects of each case are taken into account. For that reason, after careful consideration, the following attributes of each municipality will be highlighted in this chapter. *(1)* Municipal challenges and sustainable development vision, *(2)* relevant financial policy for sustainable development and *(3)* municipal financial overview. Applying this method using secondary sources will provide an additional base of understanding to support the empirical data analysis in chapter 5. After the individual cases have been introduced, a short comparison will be made as to why these cases are inherently different while displaying similarities at the same time. The figure below shows a map of the Netherlands. The circles indicate the location of Utrecht, Eindhoven and Maastricht respectively.

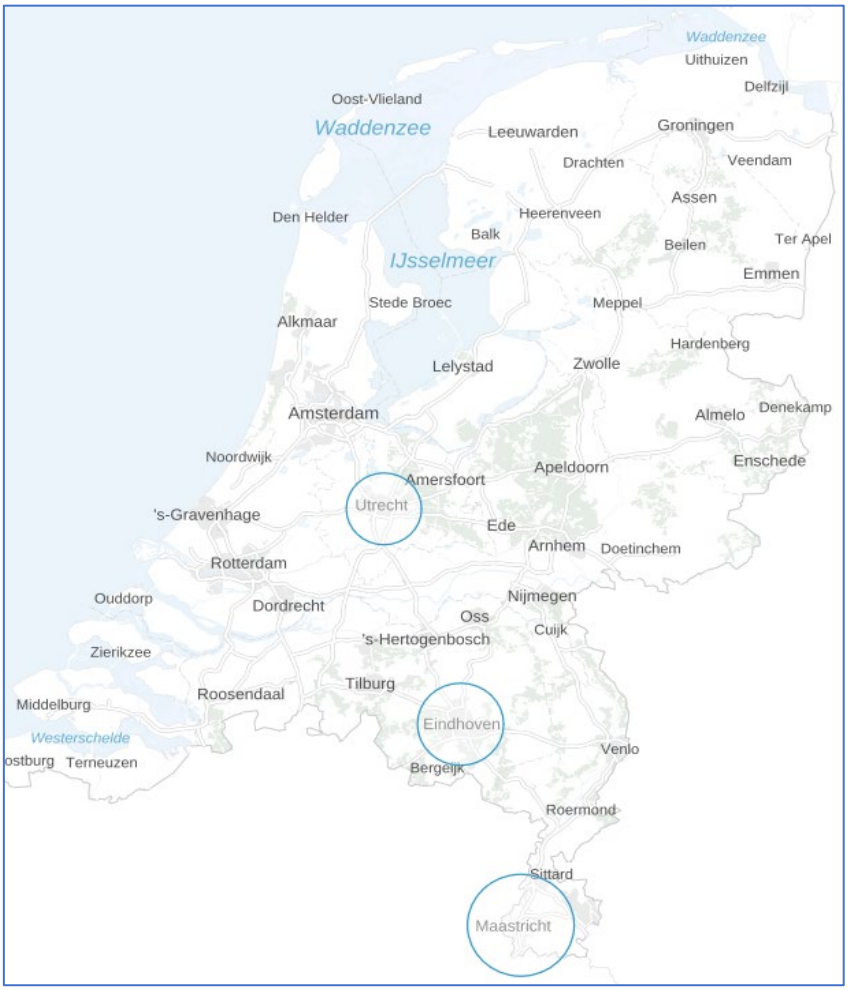

Figure 10: Map of the Netherlands highlighting the case study areas. Circles serve as indication (Atlas Leefomgeving, 2022).

Utrecht

Utrecht is the fourth most populous municipality in the Netherlands, home to 360.000 inhabitants (CBS, 2022d). It serves as the provincial capital of the equally named province of Utrecht. Therefore, it is considered to be the central hub of the province in employment, education, transportation and service provision. Utrecht is nationally known for its excellent transportation network via public transport, as well as being a student city bolstering an array of schools and a large university. These inherent pull-factors that Utrecht has, have led to a high demand for housing in the municipality (Gemeente Utrecht, 2019). Because of the high demand for living in Utrecht, the municipality is expected to grow to approximately 475.000 inhabitants by 2040 (Gemeente Utrecht, 2022), an increase of 32% from 2021. The following paragraphs will focus on Utrecht's vision on how the municipality intends to develop its urban space in a sustainable way in order to facilitate the immense population growth in the coming decades.

Sustainable urban development vision and challenges

Utrecht's development strategy is mainly laid out in their Spatial Strategy 2040 document (*Ruimtelijke Strategie Utrecht 2040*, *RSU*). The Dutch abbreviation of RSU will be used to refer to the document. It must be mentioned that the RSU is not a binding document, but merely a strategic vision document. However, the document is used as the main guideline, or indication, for sustainable urban development on a city-scale level (Gemeente Utrecht, 2021b). Therefore, this document is of importance for this research. Next to the main municipal vision and challenges, it also contains investment strategies that will be used to facilitate sustainable urban developments in the long term.

Utrecht's vision on sustainable urban development has multiple goals, the main goals are that the city should be: (1) green, (2) connected, (3) compact, (4) inclusive and affordable, (5) future-proof and (6) slow-paced (Gemeente Utrecht, 2021b). These six main goals are umbrella terms for the challenges that Utrecht has to combat in the coming decades in order to keep up with trends on a local, regional and a national scale. Next to that, Utrecht wants to profile itself as the '10-minute city'. This means that main human activities such as shopping, working and recreation should be in close proximity for inhabitants in the city, no matter what mode of transport is utilised. The aforementioned six main goals along with the ambition to create the '10-minute city' are the recurring theme when looking at developing urban spaces sustainably (Gemeente Utrecht, 2021b). Thus, sustainable urban development is more than just energy neutrality and green spaces for Utrecht, contrary to popular belief. Their vision also focuses on the social aspects of urban planning, as well as infrastructure and affordability. In order to make sure that the sustainable development goals can be carried out, the challenges for Utrecht have to be clear and concise. The RSU mentions the main hurdles that Utrecht has to overcome in order to facilitate urban growth.

Housing can be seen as the primary instigator for spatial challenges in Utrecht. Due to high demand, there is a housing shortage, combined with a shortage of affordable homes as a consequence of high market prices. To facilitate the population growth Utrecht expects to add 60.000 homes to their housing stock before 2040, which currently sits at 157.000 (Gemeente Utrecht, 2021b). The municipality wants new homes to be developed in existing urban areas, which heavily pressures existing public infrastructure such as roads, public transport networks and public spaces. In order to indicate what effects newly built neighbourhoods will have on new and existing infrastructure Utrecht has coined a 'barcode' method. The barcode shows the needed space in hectares for public infrastructure and services per 10.000 newly constructed homes. The barcode uses the intelligent

combination of spatial functions in order to create a net profit when it comes to spatial use (Gemeente Utrecht, 2021b).

Infrastructure in Utrecht is currently overburdened. The city is congested, and existing public transport has reached its capacity. The accessibility of Utrecht is therefore diminishing. The RSU mentions that expanding capacity is insufficient to achieve policy goals, both in the present as for the future. Capacity expansion without regarding the change in transportation methods and efficiency is thus unfavourable in the long term.

Green spaces in urban environments must be plentiful, but the densely packed space of Utrecht makes this difficult to realise. Therefore, their ambition is to realise larger green environments closer to the city perimeter. Local green spaces will be smaller, and buildings will have to be used to facilitate biodiversity in the city, mainly through utilising roof spaces. Housing, infrastructure and greening can be seen as the most challenging tasks that Utrecht has to face when dealing with a rapidly growing population. This is also reflected in the investment overview given in the RSU.

Financing sustainable urban development

Utrecht has developed an overview of the primary investment tasks that are correlated with the growth of the city until the year 2040. The total cost of the urban development to facilitate Utrecht's ambitions and urban growth is estimated at 7.1 billion euros. The overview is shown in figure 11.

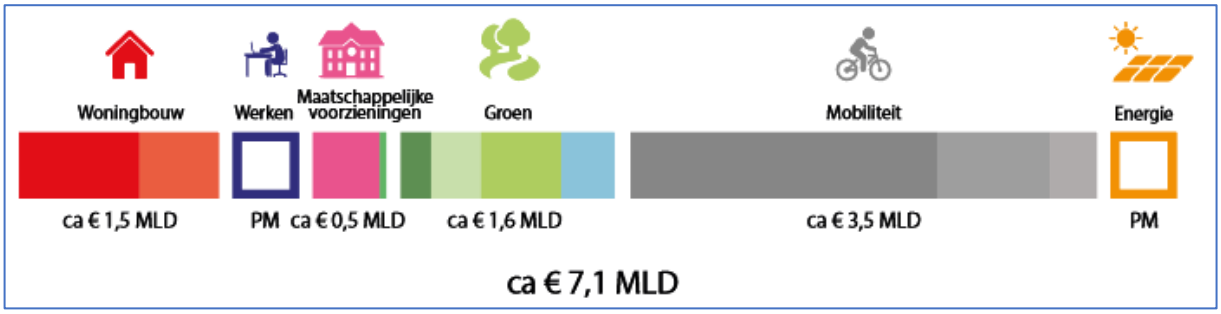

Figure 11: Overview of investment tasks needed before 2040 in Utrecht. From left to right: Housing, Working, Social Services, Green, Mobility and Energy. (Gemeente Utrecht, 2021b).

As figure 10 illustrates, the investment necessary for mobility, or in other words infrastructure, is by far the largest with 49%. Green space development and housing construction follow suit, respectively with 23% and 21% of the total investments necessary. Social services require the least amount of up-front investment at 7%. According to the municipality, investments in renewable energy production and the conversion of workplaces are left for market actors, hence the municipality cannot estimate the investment costs yet. The financing of sustainable urban development is not solely done by the municipality. Other governmental organisations contribute financially as well. The RSU therefore contains a subdivision wherein the 7.1 billion euros is divided between the municipality, province, national government and the European Union. The subdivision is shown in figure 12.

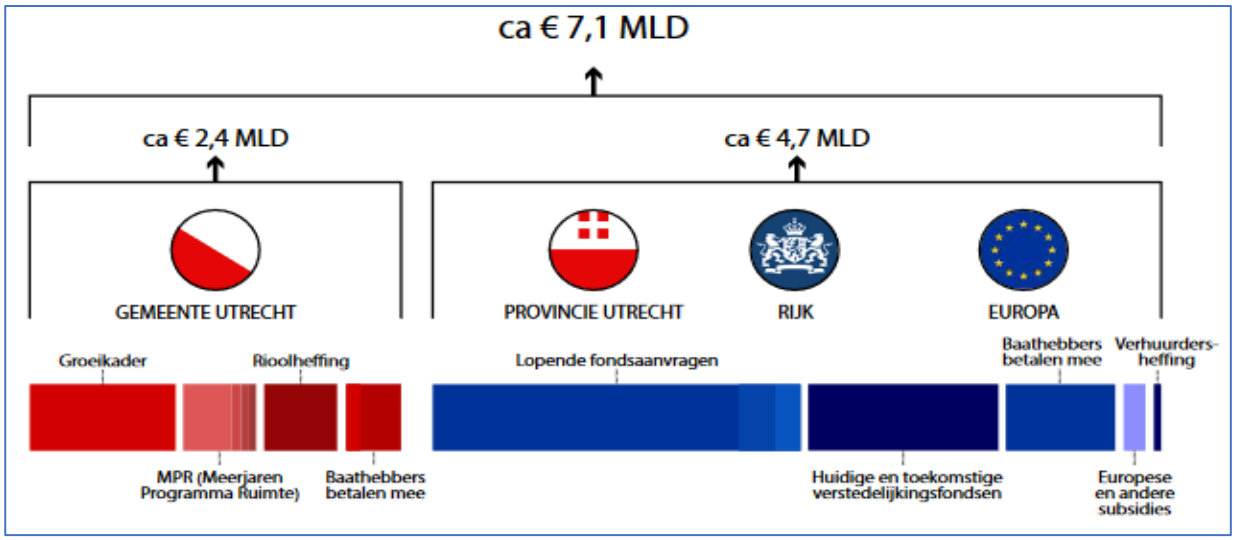

Figure 12: Division of investment costs for Utrecht between layers of government. From left to right: municipality, province, national government and Europe (Gemeente Utrecht, 2021b).

Some things stand out when analysing the subdivision of investment costs. Firstly, the municipality intends to contribute 34% of the total costs itself. Most of the investments (66%) will have to be financed by other public bodies. It has to be mentioned that the municipality of Utrecht already receives a large portion of their yearly income (57,8%) from the municipality fund (Gemeente Utrecht, 2021a) (Ministerie van Algemene Zaken, 2022). Therefore, it ranks above the national average of 51%. Secondly, the red square at the right of the municipal spending overview indicates that developers contribute towards the investment costs. '*Baathebbers betalen mee*' translates to 'beneficiaries pay along'. The RSU specifically mentions that market actors whom benefit from urban development will have to contribute to on-site and off-site developments. The developer's contribution is estimated to make up 17% of the total investments carried out by the municipality itself through value capturing and cost recovery mechanisms (Gemeente Utrecht, 2021b). Securing developer contributions for off-site infrastructure will happen through a joint off-site contributions fund (*Fonds Bovenwijkse Voorzieningen*). The RSU mentions that the municipality is still exploring the implementation and use of this specific investment strategy. The empirical research will have to provide more information regarding this topic, as it is highly relevant for financing sustainable urban development in Utrecht for both the short and long term. However, Utrecht does have policy about cost recovery through developer obligations in their document from 2017: '*Het Utrechts grondbeleid*' – Utrecht's land policy. The paragraph on facilitating land policy mentions the legal framework for developer obligations, both for planning costs and off-site infrastructure. Their intention is clear: 'As of 2017, Utrecht will pay attention to possibilities and bases for maximum cost recovery of investments in each initiative' (Gemeente Utrecht, 2017). The ambitions regarding cost recovery through developer obligations are high in Utrecht. The empirical research results will determine how this has been implemented in practice.

Municipal financial overview

Serageldin et al. (2008) state that local governments are able to develop sustainably, under the condition that some characteristics are met. Not only do managerial and technical aspects contribute, but fiscal capacity plays an important role in the ability of a municipality to develop sustainably. That is why it is beneficial to include key financial aspects that might provide an extra insight in fiscal capacity and financial health. Jongsma et al. (2022) have published relevant secondary data that can be used to analyse the financial situation of a municipality using five indicators. For the purpose of this research, the analysis using the five indicators will be carried out for all of the cases,

not just for Utrecht. The explanation related to the indicators in this paragraph will also apply to the upcoming case-related paragraphs.

- *Solvency*. Solvency relates to equity, and assets owned by the municipality. A higher degree of solvency indicates that an organisation is able to cover financial setbacks better.
- *Debt-to-equity ratio.* Compares the amount of borrowed capital to municipal equity. It provides an indication of the pressure that interests cost can exert on operating costs. A lower percentage indicates a good ratio.
- *Exploitation*. Illustrates the value of land assets compared to total municipal revenue. The higher the percentage, the more dependent a municipality is on land sales and revenue.
- *Structural operating capacity*. This indicator shows the capacity a municipality has to bear its own burdens.
- *Taxation capacity*. This shows the room municipalities have to use taxation methods in order to increase revenue, compared to the Dutch average. A low percentage indicates that there is still room for more taxation. Previously discussed land-based finance methods such as the property tax (OZB) are included in this indicator.

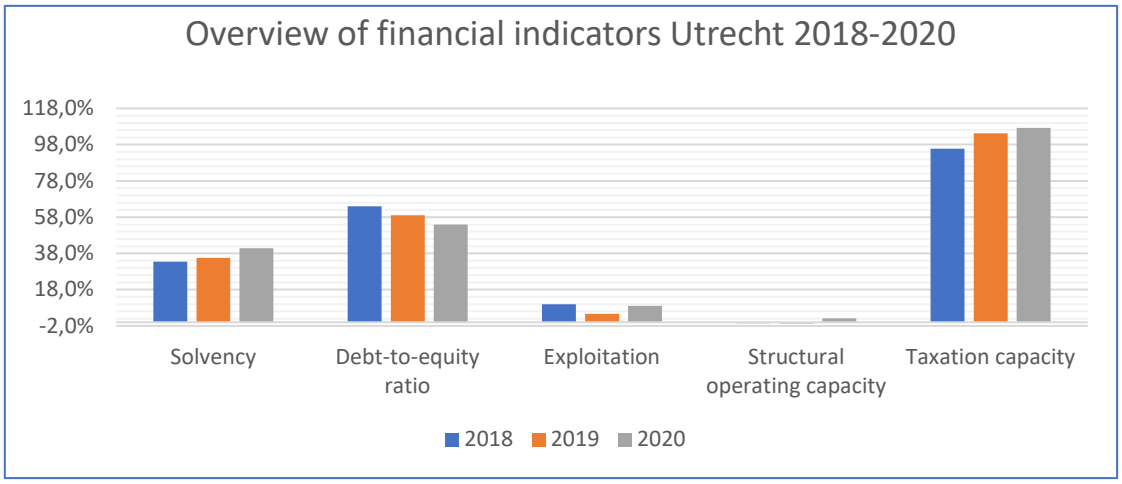

Figure 13: Overview of financial indicators for Utrecht, 2018-2020. Data: (Jongsma et al., 2020, 2021, 2022)

Figure 13 shows the five financial indicators for the municipality of Utrecht. The charts show a positive trend in favour of Utrecht when it comes to solvency, debt-to-equity ratio, and operating capacity. On the other hand, the exploitation ratio has grown slightly, which can indicate that Utrecht is depending on land sales or revenue. According to Jongsma et al. (2022), an exploitation percentage higher than 10% is deemed risky, at the end of 2020 Utrecht had a percentage of 9%. However, an increase of active land positions can also mean that investments in housing and area development have grown as a response to the housing shortage. Next to that, the taxation capacity is growing steadily, an indication that the municipality has to further increase taxes to cover expenses.

Conclusion

This introduction to Utrecht and its relevant aspects for this research have shown that Utrecht is an ambitious municipality with a very large investment task in the near future. Investments have to be carried out by developers as well, and relevant policy in the form of a fund for off-site investments is being made. Finally, the financial indicators show no sign of severe financial trouble. The most important indicators 1&2 (Jongsma et al., 2022) show positive developments for Utrecht. The empirical research will reference these outcomes to find out if Utrecht is able to implement sustainable urban development using developer obligations as a financing method, also regarding relevant policy and ambition documents.

Eindhoven

The urban municipality of Eindhoven is located in the south-east of Noord-Brabant, and with a population of 235.000 inhabitants the fifth most populous city in the Netherlands (CBS, 2022d). Eindhoven is known for being the centre of the 'Brainport' region, an area leading the Netherlands when it comes to innovation and technology. Therefore, Eindhoven can be acknowledged as the technology capital of the Netherlands, mainly due to the presence of a large technical university and many technological conglomerates such as Philips and ASML. The attractiveness of the city leads to a high demand for housing, similar to Utrecht. Eindhoven has the ambition to embrace urban growth, while simultaneously strengthening the technology sector (Gemeente Eindhoven, 2020a). Thus, Eindhoven is prognosed to exceed 300.000 inhabitants by 2040 if growth is facilitated by the municipality (Gemeente Eindhoven, 2020a, 2020b). This would mean a population increase of 28% in the coming decades.

Sustainable urban development vision and challenges

Contrary to Utrecht, Eindhoven does not have one single strategy document with the primary urban vision and challenges, instead it is split across multiple documents such as the '*omgevingsvisie'* and '*ontwikkelperspectief Eindhoven 2040*', respectively a spatial vision document and a development perspective for 2040. Their main ambitions for the future of Eindhoven are: (1) to become an economic world player, (2) a healthy and future-proof city, (3) a social, inclusive and hospitable city and (4) an authentic city. In order to turn their vision into reality, Eindhoven has proposed six urban assignments that have to be carried out. The main assignments include improving local infrastructure, ensuring healthy urban growth, and densification (Gemeente Eindhoven, 2020a). There is a strong focus on developing Eindhoven's position in the perspective in the regional and national economy. The vision documents therefore focus on the challenges that relate to urban and economic growth in Eindhoven. Eindhoven has large ambitions, and a clear goal on their version of sustainable urban development. However, the city already copes with issues regarding housing, infrastructure and climate adaptation.

The municipal ambition to facilitate growth will lead to an expected housing stock increase of 40.000 homes (APM et al., 2020). A primary challenge for the municipality is to ensure that the city will be inclusive, which would mean that social housing is an important factor for sustainable development. The municipality wants to make sure that a large portion of the homes will be located in high-density neighbourhoods. This does not mean that all homes will be built in the existing city centre. Eindhoven will make use of its polycentric city model, and create dense urban areas around existing spatial structures (Gemeente Eindhoven, 2020a). Examples of high-potential spatial structures are public transport hubs, campus locations, and commercial locations. This will not only spread urban growth across the city, but will provide opportunities to other surrounding areas that are not in proximity of the city centre.

However, increasing the number of homes and workplaces is detrimental for Eindhoven's infrastructure. Currently Eindhoven's infrastructure is inefficient, with public transport at high capacity, as well as congested roads in the inner city and surrounding highways (Gemeente Eindhoven, 2020a). Further urban growth requires large investments in existing and new infrastructure in order for the system to function efficiently. New (international) train lines are needed, as well as measures to reduce the number of cars in the dense areas of the city. The expected urban growth will demand investments in approximately 44.000 parking spaces to handle

the increased traffic (APM et al., 2022). If infrastructure is not upgraded and expanded, the prognosed urban growth will lead to negative externalities for inhabitants and businesses in Eindhoven, an effect that is detrimental for their ambitions.

Climate adaptation measures are lacking. Eindhoven struggles with heat stress in the entire city, as current green spaces are insufficient, with an exception of larger green spaces along the city outskirts (Gemeente Eindhoven, 2020a). In addition, the city centre deals with water management issues in times of heavy rain. In order to combat these issues greener spaces will be allotted per building project. In turn, residents will enjoy urban green spaces, while heat and water stress levels will reduce. Housing, infrastructure and climate adaptation can be seen as the main challenges for Eindhoven when looking at urban expansion in the future.

Financing sustainable urban development

Sadly, Eindhoven does not have a cost indication of the necessary investments needed to facilitate urban growth. However, the municipality does mention that financial resources are scarce, and that cooperation other public bodies, as well as with market actors is necessary in order to implement their sustainable urban development goals. The spatial vision document mentions examples of multi-governmental cooperation through Housing Deals (*Woondeals*) between Eindhoven and the national government. Housing Deals allow for subsidies that can accelerate housing production, as well as removing obstacles in regulation and legislation (Gemeente Eindhoven, 2020a). Another example is the Region Deal Brainport Eindhoven, where a onetime financial impulse is given by the national government to invest in amenities related to talent development and opportunities for economic growth (Brainport Eindhoven, 2022). These subsidies are granted because the national government recognizes the important of Brainport Eindhoven, and therefore is willing to invest (Gemeente Eindhoven, 2020a). Unrelated to the national government's interest, the dependence on government contributions is relatively high in Eindhoven. In 2021, 59.1% of their income stemmed from the municipality fund (Gemeente Eindhoven, 2021) (Ministerie van Algemene Zaken, 2022). This figure is far above the national average of 51%, and also above Utrecht's percentage of 57,8%.

However, government subsidies will likely not cover the complete costs associated with rapid urban growth. In order for market actors to pay their fair share, Eindhoven has developed an off-site infrastructure fund for developer obligations. This is laid out in the Note Cost Recovery Off-site Infrastructure (*Nota kostenverhaal bovenwijkse voorzieningen*). The main rationale is that in order to accommodate urban growth, investments in large public infrastructure projects are necessary. New developments in Eindhoven will profit from new infrastructure, hence developers should contribute to the designated investment fund (Gemeente Eindhoven, 2020b). The document contains an extensive list of 'hard' and 'soft' projects. Hard projects have a large degree of certainty that they will be carried out within a timeframe of 10 years. Next to that, costs are detailed and third-party funding has already been acquired. Due to the certainty, the municipality requires 100% of the remaining investment costs after subsidies to be paid by developers, a sum of approximately €67 million.

Soft projects have a lesser degree of certainty, but are amenities that are high on the municipalities' wish list. However, the coverage of the necessary funds is not yet clear. Therefore, the chance exists that the project will not be realised within 10 years. Due to the risk surrounding the soft projects, developers are expected to pay 50% of the expected remaining investment costs after third-party subsidies. The total sum for contributions to soft projects is approximately €69 million. Adding both the hard and soft projects leads to a contribution of €136 million to be paid by developers.

However, the existing urban areas in Eindhoven also profit from new amenities. That is why the municipality requires developers to only pay for 40% of the investment costs (€54 million), while the existing city pays 60% (€82 million). The contribution by the existing city will be paid by the municipality itself and third-party subsidisers such as the national government (Gemeente Eindhoven, 2020b). This leads to a developer obligation for off-site infrastructure of €42 per added square meter of residential area, and €11 per added square meter of commercial area. The contributions are gathered in a fund that will be used to allocate the correct amounts for each new project. As this method is a more direct way of implementing developer obligations, the empirical research results will illustrate how this works in practice, and what the potential consequences are for cost recovery for Eindhoven's sustainable development goals.

Municipal financial overview

The aforementioned five financial indicators, as stated by Jongsma et al. (2022), will be presented in order to give an insight into Eindhoven's financial developments. Figure 14 shows the financial indicators for the years 2018-2020.

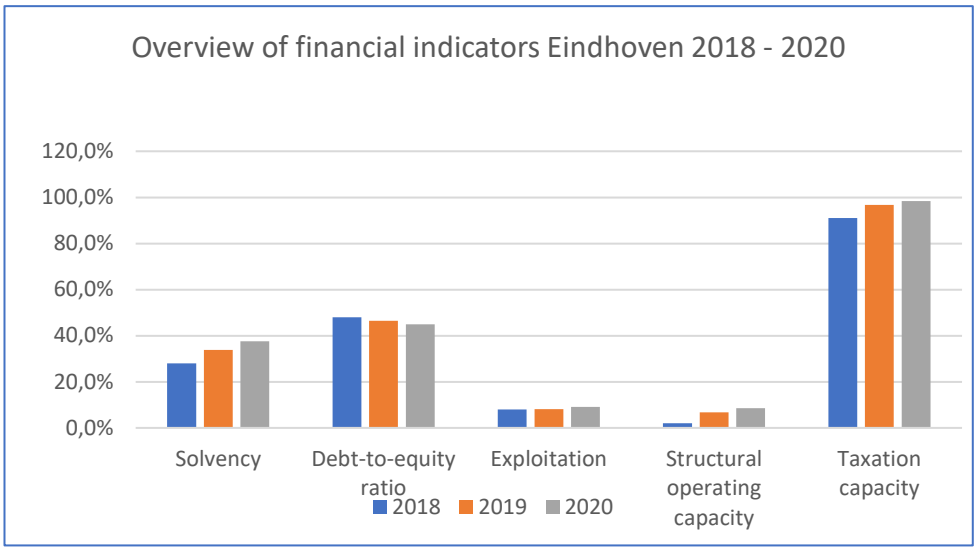

Figure 14: Overview of financial indicators for Eindhoven, 2018-2020. Data: (Jongsma et al., 2020, 2021, 2022).

Eindhoven and Utrecht share a similar financial situation when it comes to the five indicators. Solvency, debt-to-equity ratio and structural operating capacity all show a positive trend for Eindhoven. In addition, the exploitation rate is growing, and is the same as Utrecht at 9,1%. The taxation capacity has steadily increased, showing signs that municipal taxes have gone up. However, Eindhoven's taxation capacity is still relatively low at 98,4%. There is still room for further revenue creation, as Utrecht's capacity has peaked in 2020 to 107%.

Conclusion

Eindhoven's ambitions regarding economic growth will have significant impacts on the urban structure of the city. Large investments in amenities and infrastructure are needed to make ambitions become reality. Due to the economic importance of the city and the region, the national government is willing to provide additional funding. Market actors will pay when it comes to the cost recovery of off-site infrastructure, through an off-site infrastructure fund with a fixed contribution. Thus far, Eindhoven shows no sign of financial trouble based on the five indicators. The interview results will determine how well prepared the city actually is when it comes to using their financial methods, with a focus on developer obligations, to promote sustainable urban development.

Maastricht

Located in the south of the Netherlands, Maastricht is the provincial capital of Limburg and with 120.000 inhabitants the most populous city of the province (CBS, 2022d). Maastricht differs from the other two cases because Maastricht is not a city that expects rapid population growth in the coming decades. Instead, the population is stagnant, and hovers around 120.000 inhabitants since the year 2000 (CBS, 2022d). The surrounding municipalities and the majority of South-Limburg are dealing with an ageing and declining population. However, Maastricht is the major exception to this phenomenon (CBS, 2022e), as it provides pull-factors such as a large university, academic hospital and relatively many job opportunities compared to neighbouring municipalities. The main influx of new inhabitants are workers, migrants and students. The challenges Maastricht faces are therefore not directly related to growth, but to adaptation. Maastricht has to adapt itself in order to provide the right services that the city and the surrounding region need in order to develop for the future.

Sustainable urban development vision and challenges

Being the most important city in the south of Limburg, Maastricht's vision on sustainable urban development focuses on being the main economic, social and cultural driver in the region.

Maastricht's spatial vision document for 2040 'Cherish the balance' (*Koester de balans*) contains three main visions for the physical environment. (1) Improve the regional network function of the city, for the purpose of social and economic vitality, (2) Invest in a future-proof and inclusive living environment and (3) maintain the intrinsic attractiveness of the city. There is a strong focus on Maastricht's regional position and economic strength (Gemeente Maastricht, 2020). This is an ambitious goal of the city, to grow economically while local population growth is non-existent. However, in order to facilitate this Maastricht will have to overcome large challenges.

Large investments in the local business climate are needed in order to make sure that the city attracts enough educated workers that stay for a longer period of time. Examples of such investments include: (1) ensuring that local business parks and knowledge hubs are easily accessible, both for national and international commuters, (2) the creation of varied living environments to accommodate new workers, (3) an extensive supply for high-quality amenities and recreational facilities, and (4) encouraging sustainable transport and a better accessible inner-city (Gemeente Maastricht, 2020)

However, the economic ambitions expose challenges related to sustainable urban development that still have to be addressed in order for the city to be future-proof. Next to general challenges such as the energy transition and heat-stress, Maastricht has the issue of water management. The river Meuse (*Dutch: Maas*) is affected by climate change and heavier rainfall, and recently flooded parts of Maastricht in 2021 (Waterschap Limburg, 2021). In order to prepare Maastricht for the future, higher water discharges must be taken into account. On the other hand, the chance of flooding must be reduced. Investments are needed to make room for the Meuse, as well as prepare Maastricht for extreme weather conditions (Gemeente Maastricht, 2020).

The construction of new homes will be focused on the social sector, as well as student accommodations. Large greenfield developments will not take place in Maastricht, the existing city will be utilised (Gemeente Maastricht, 2020). However, infrastructure improvements for sustainable mobility options will require large investments in existing urban areas that cannot be accounted to one specific development. In addition, the development of international infrastructure is a key component in ensuring that Maastricht has an advantage as an economic hub in the region.

Financing sustainable urban development

Maastricht does not provide an indication about the actual costs of necessary investments in the spatial domain, but do refer that the total amount will be lower than in previous years where they realised major area development. Especially the new A2 underpass, alongside new property developments on top, and the restructuration of the *Belvéd*ère industrial area in the north of the city have been sizeable projects in the past.

The municipality itself will contribute a substantial amount towards new sustainable urban development (Gemeente Maastricht, 2020). However, it is also mentioned that all new and existing users will profit from investments in public space. Cooperation and co-financing is necessary in order to make ambitions become reality. The municipality acknowledges that off-site infrastructure is needed, and can partly be financed by cooperating with developers. However, the municipality does not have specific policy for cost recovery regarding off-site infrastructure contributions (Gemeente Maastricht, 2020). As a consequence, there is no fund for off-site costs, as was the case in Eindhoven. The vision documents states that the city council has initiated research into the applicability of a similar fund in Maastricht. The empirical research will elaborate on this process. But in preparation for an eventual off-site infrastructure fund, the municipality has mentioned multiple physical destinations where the monetary contributions would go to.

With no real estimate of developer contributions towards urban development, Maastricht will be dependent on subsidies from the European Union, as well as the national and provincial government. In 2021, contributions from the national government were responsible for 55,5% of Maastricht's total income (Gemeente Maastricht, 2021) (Ministerie van Algemene Zaken, 2022). This is lower than Eindhoven and Utrecht, but still higher than the national average.

Municipal financial overview

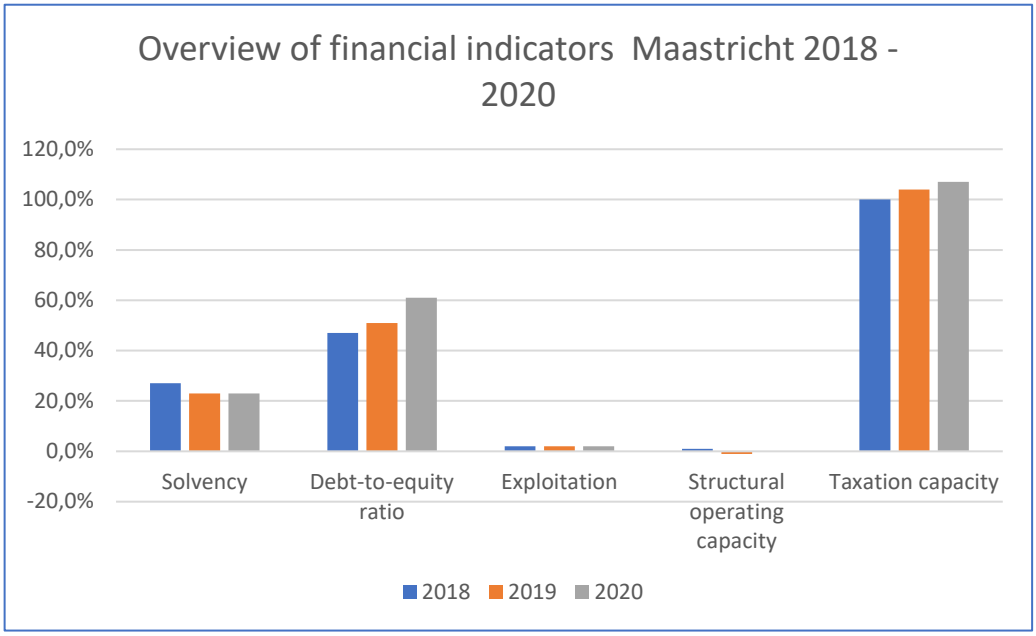

Figure 15: Overview of financial indicators for Maastricht, 2018-2020. Data: (Jongsma et al., 2020, 2021, 2022).

Figure 15 shows Maastricht's financial situation based on five elements (Jongsma et al. 2022). Maastricht differs from the other cases, as the solvency and debt-to-equity ratio are showing negative trends. Furthermore, the structural operating capacity is hovering around 0% in 2020, this indicates that the municipality might not be able to use its income to pay off its dues. To make matters worse, there is little room for Maastricht to increase its taxation capacity, in 2020 the capacity was already at 107%. Figure 14 shows that Maastricht is financially in a worse place compared to Eindhoven and Utrecht. The empirical research results will illustrate if and how this can be linked to sustainable urban development in Maastricht.

Lastly, a quick comparison of figure 13, 14 and 15 confirms that Maastricht is doing 'the worst' when it comes to their municipal finances, followed by Utrecht and Eindhoven, which is performing the best. The results from the empirical research will determine if this is also visible in practice, and potentially related to developer obligations or the rest of the land-based finance framework in the municipalities.