REAL ESTATE FINANCIAL MODELING

JEROEN C. DE JONG



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FUNDAMENTS FOR APPLIED
REAL ESTATE CALCULATIONS

Real Estate Finance Modeling
1st edition 2026

Author : Jeroen C. de Jong
Corrections : Marieke Bras
Design : Bureau Zeker, Naaldwijk
Printing : Printforce
Publisher : SPRYG Real Estate Academy
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NL: +31 (0)15 303 0670
spryg.com

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ISBN/EAN 978-94-92453-24 2
NUR-165

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FOREWORD

For those unfamiliar with real estate and area development, our profession is often associated with collaboration, stakeholder engagement, participation processes and creating support within communities. Those elements are indeed essential. Yet they represent only part of the story.

At its core, real estate development is about turning ideas into tangible places: homes, neighbourhoods, workplaces and public spaces. These developments require investments, careful financial planning and well-founded decisions. Behind every successful project lies a financial reality of costs, revenues, risks and returns. Understanding that reality is indispensable for anyone working in our field.

This English-language edition is therefore more than a translation of a successful Dutch publication. It is also an opportunity to make the knowledge, experience and practical insights developed within the Dutch real estate and area development sector accessible to a wider international audience. The Netherlands has built a strong tradition in integrated area development, combining financial discipline with long-term value creation, sustainability and collaboration. I believe many of the approaches, methodologies and ways of thinking presented in this book have relevance far beyond our national borders.

This edition serves both professionals, developers and students around the world who seek a deeper understanding of the financial principles underpinning real estate and area development.

The financial foundations of our profession are universal. This book provides a clear and practical introduction to them, written by an author I know as a substantively strong, professionally competent colleague. Drawing on a wealth of experience, he has clearly outlined everything you need to know in this field.

I wish you an enjoyable and rewarding read.

Harm Janssen
CEO
BPD Europe



ABOUT THE AUTHOR

Jeroen C. de Jong is a teamlead area development and senior urban economist at BPD Netherlands, bringing over two decades of expertise in urban development. He evaluates economic scenarios and provides guidance on the financial aspects of complex projects. Additionally, he conducts courses at SPRYG Real Estate Academy, focusing on real estate financing and modeling. Jeroen combines his passion for urban development and economics to create sustainable, future-proof plans that are both economically viable and socially impactful.

FROM THE AUTHOR

I am delighted to introduce the 1th English edition of Real Estate Financial Modeling.

The world of urban development in the Dutch and broader European context is evolving rapidly. Climate change continues to demand global attention and has a profound impact on the real estate sector. Challenges such as sustainability, grid congestion, nitrogen emissions, and housing shortages require integrated solutions and close collaboration between all stakeholders involved.

With this English edition, my goal is to share my knowledge and expertise beyond the Netherlands. I hope to support international students and professionals working in the Dutch real estate sector, as well as those abroad who are interested in the Dutch approach to real estate modeling and urban development. The translation of this book is a step toward building bridges between local practice and global learning.

On a personal note, I would like to express my deep gratitude to my parents. Despite my mother's physical health challenges and my father's Alzheimer's, they continue to be a source of strength and inspiration. Their situation reminds me daily of the importance of care, compassion, and presence—values that cannot be measured in economic terms. I am also profoundly thankful to my wife Danny and our children, Cas and Naomi. Their unwavering support and love have made it possible for me to complete this new edition.

Urban development faces major challenges, but with shared commitment and innovative thinking, we can shape a more sustainable and resilient future. I hope this edition will inspire and support you in your work in the real estate field—wherever you are in the world.

Jeroen de Jong
author

A

REAL ESTATE FINANCIAL MODELING

1 FUNDAMENTALS OF REAL ESTATE

In this chapter:

- Overview of the Real Estate Process
- Stakeholders in the Real Estate Process
- Management of Real Estate Development
- Urban, Expansion, and Redevelopment Locations

1.1 Introduction

This book aims to provide insight into the world of real estate development, realization, and management, all grounded in the modeling that underpins every decision—essentially, real estate modeling.

A

Understanding real estate modeling goes beyond the calculation itself. At its core, it revolves around the principle that revenues must exceed costs to realize a profitable or feasible project. The calculation itself is not overly complex. This book will not teach you how to model; rather, it will delve into the creation of these models and the reasoning behind them. The complexity of real estate modeling lies primarily in the substantive knowledge required for the input and the uncertainty of many assumptions that must be made. This means that the outcome of a real estate model often has multiple answers. The complexity mainly arises from interpreting these outcomes.

On the one hand, this textbook addresses general knowledge of real estate development, realization, and management, as this foundational knowledge

is crucial for becoming proficient in real estate modeling. We will examine the parties involved, their influences, and their interests. Additionally, we provide insight into the various financial models that occur throughout the entire construction process. This process consists of many different phases, each with its own model or financial assessment. A construction process is a continuous sequence of activities that follow one another. This is also true for the seemingly standalone financial assessments. After each model, a subsequent model follows, where the outcome of one financial assessment becomes the starting point for the next. You can probably imagine that different parties are involved in each phase of the process, each with their own interests. The interplay between the different phases and the associated financial assessments creates tension between the involved parties and their financial interests.

This book provides deeper insight into the various relationships and interests within the real estate process. The process is lengthy and involves various parties, each with their own interests. When different interests converge, a form of tension often arises, leading to negotiations. These negotiations can involve principles, design, or aesthetics, but most often revolve around financial interests. Therefore, it is crucial to understand both the system and the position of your competitor or partner. As in any negotiation, you have the best chance of success if you are one step ahead of your negotiating partner. Understanding the interests of your negotiating partner with substantive arguments will increase the likelihood of a positive outcome.

This book does not dictate what is right or wrong. Its goal is to broaden your understanding and knowledge of real estate modeling and the entire real estate process.

1.2 Development Phase

The construction process can be divided into several distinct phases. Each phase is a part of the overall process, with a clear beginning and end, and each phase should be concluded with a decision, either positive or negative (go/no go). In the case of a positive decision, the process moves to the next phase (go), and in the case of a negative decision, there are essentially two options: repeat the phase or terminate the process (i.e., project) (no go).

There is a clear distinction between the initial period of 'development' and the subsequent period of 'management.' The development phase is a complete entity, with the result being the delivery of the building. Following this, the utilization and management of the building commence. This period is relatively longer than the development phase.

See the diagram below:

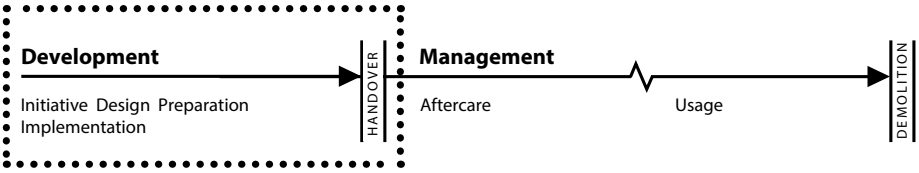


Figure 1.1 Development Phase

In the diagram, several phases and milestones are shown. What stands out is that most phases occur during the development period. Compared to the lifespan of a real estate object, this period is relatively short, during which various stages of the development phase quickly follow one another. The main characteristic of the development of a building is working towards a milestone: property handover. The management phase does not really have any milestones. The main characteristic of the management phase is maintaining the building over a long period, both qualitatively and functionally.

Even though the two phases in the real estate chain differ so much in characteristics, they are financially inseparable. The value of the building is determined by the revenue potential in the management phase, and this revenue potential determines the investment level at the beginning of the period (the purchase of the building). This investment level then determines, in most cases, the maximum cost price of the development and realization of the building.

The development phase is characterized by the succession of several relatively short phases in which an idea or initiative ultimately comes to fruition. This entire process is called the development of the object and/or its environment. It is a defined process with a clear end: completion. Even in the interim, several milestones can be identified that must first be passed before moving on to the next step (or phase). Each phase is briefly explained in the next paragraph.

1.2.1 Initiative

Every development or process starts with an initiative or an idea. There are many reasons that can lead to an initiative for development. In housing construction, for example, demographic development (population growth) can be an important reason for developments in expansion areas. In urban areas, for example, a former industrial site on the outskirts of a city, which has suddenly ended up in a city center due to growth at the edges of a city, can give rise to redevelopment. This is because it no longer fits within the structure of the city and its surroundings. Redevelopment of such an area is then a good starting point for a new development.

Naturally, there are numerous other examples to consider. It is essential to acknowledge that every initiative shapes a vision of the intended goal. Financial insight can be crucial during this phase. If it is already apparent from the outset that the task is financially unfeasible, it does not make sense to invest years of effort into it. This initiative phase is the most uncertain phase of the construction process, but on the other hand, it is also the phase in which many directions are possible. It is crucial to define as much as possible during this phase, while also allowing sufficient flexibility for future adjustments.

1.2.2 Design

When sufficient principles have been defined and concluded with a positive decision in the first phase (the initiation phase), the first elaboration follows. This elaboration can consist of creating drawings, calculations, and conducting technical investigations. A commonly used principle in this phase is forward and backward thinking. This means that with each step forward, you also refer to what has been reviewed before. This way, you maintain an overview of the coherence between different steps and activities throughout the process. This principle is also encountered in real estate calculations. As the process progresses, more aspects become clear. With this broadening of knowledge, more accurate calculations can be made. However, it is important to keep recognizing the big picture. When a subsequent calculation significantly deviates from a previous one, you will look for an explanation for the deviation during a feedback session. This way of working reduces the chance of errors and unnecessary risks throughout the process.

Tip: make a prediction of the outcome before each calculation!

Why? This approach keeps you engaged and provides a sense of the calculation's outcome. Does the result align with your expectations?

As will become apparent later, the chance of calculation errors does not lie so much in the complexity of the calculation itself, but more in the complexity and the number of assumptions and input for each calculation. Therefore, always try to be as complete as possible with each calculation. Even if you really don't know, you can make an estimate. Filling in or naming something is still closer to reality than filling in nothing.

1.2.3 Preparation

Once the design phase is successfully concluded, a plan is developed to the point where it can be implemented. The vision is defined, the conditions are set, and the necessary resources are available.

However, before actual construction activities can commence, the design is further detailed in the preparation phase. In this phase, specifications are created, precisely defining what the contractor must do in the next phase. Every detail of the construction object is documented, including its appearance, required quality, and how the work should be carried out.

This also allows for a more detailed calculation of whether the principles defined in the previous phase still align with the established financial conditions. Naturally, the principle of forward and backward thinking and calculating applies here as well. By continuously referring to previous calculations, it can be verified whether the defined principles still hold and whether the project can still be realized within the established conditions.

1.2.4 Realization

Once the specifications have been detailed and approved, concluding the previous phase with a positive decision (go), the work can be awarded to one or more contractors. The realization phase can then begin.

However, this does not mean that the construction process and its management are complete. The financial margin within which control must be exercised has become much narrower. Firm agreements and monitoring of progress (planning) and finances play a crucial role at this stage to ensure a successful project.

The key milestone in this phase is completion. Completion occurs when all contractual obligations have been met, and the object is ready for use.

1.2.5 Demolition

The demolition phase does not immediately follow the realization phase. In between, the object and/or its environment are used. However, the demolition phase is part of the development phase. In real estate modeling, it belongs at the beginning of the sequence. When the lifespan of the object has ended, for example, because the costs no longer outweigh the income (economic lifespan) or because the object no longer meets technical standards (technical lifespan), or for other reasons such as social interests, the building or object will be demolished. This demolition often coincides with a new initiative. This means that the end of one process marks the beginning of a new onen.

1.3 Operation phase

The operation phase follows the development phase. After completion, the object and/or its environment will need to be utilized, maintained, and managed. The main characteristic of the operation phase is that this period lasts much longer than the development phase. Consequently, the calculations take on a different perspective. The factor of time plays a much larger role in this phase compared to the development phase.

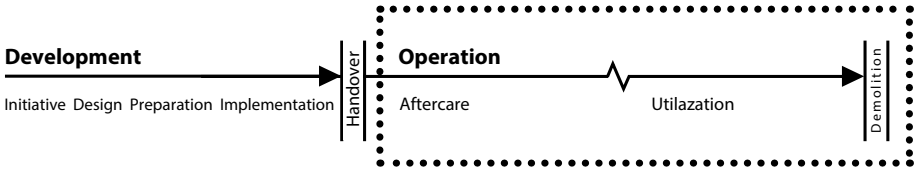


Figure 1.2 Operation

1.3.1 Aftercare

In the diagram, the first phase mentioned is ‘aftercare.’ This phase still belongs to the development period. Aftercare involves addressing the remaining issues that persist after the property handover. However, because the milestone ‘property handover’ serves as the clearest distinction

between the development phase and the operation phase, the diagram is presented in this manner.

1.3.2 Utilization

The operation phase is characterized by its long duration. The main objective in this phase is to maintain the functionality and quality of the object (and/or its environment). The operation phase applies to everything in the built environment. A familiar example is the management of public spaces by the municipality. Another example is the management of an office building by an investor. And closer to home: the management of one's own house or, in the case of a rental property, management by the housing corporation.

Every management of an object and/or its environment involves a financial aspect, where costs and revenues must be balanced. Due to the long duration of this phase, the factor of time becomes very important. Calculating (with money) over time is also known as the time value of money. This topic will be discussed in detail later in this book.

1.4 Construction Process Management

Since the realization of real estate is a complex and often lengthy sequence of (project) activities that must lead to the construction and ultimately the handover of an object, it is important to gain control over this process. In other words, managing this process. Each phase must lead to a specific result on which a decision must be made.

To make a well-considered decision and effectively manage the process, it is useful to identify several aspects that can be controlled and evaluated. To ensure proper process management, the method of 'project-based management' is often applied. Project-based management is a goal-oriented and efficient approach, where continuous feedback occurs on several management aspects: Quality, Cost, Time, Organization, and Information. This is also known among real estate managers as Q.C.T.O.I. (or in another order of the same letters).

As outlined in the previous diagram, the construction process consists of several consecutive phases, each of which must be completed before

moving on to the next phase. At each transition to a new project phase, the balance between the five management aspects (Q.C.T.O. and I) must be maintained. This involves reviewing what was conceived or established in the previous phase and making projections for the subsequent phases. The next phase is detailed, while the later phases are considered more broadly.

In a diagram, the management process can be represented as follows:

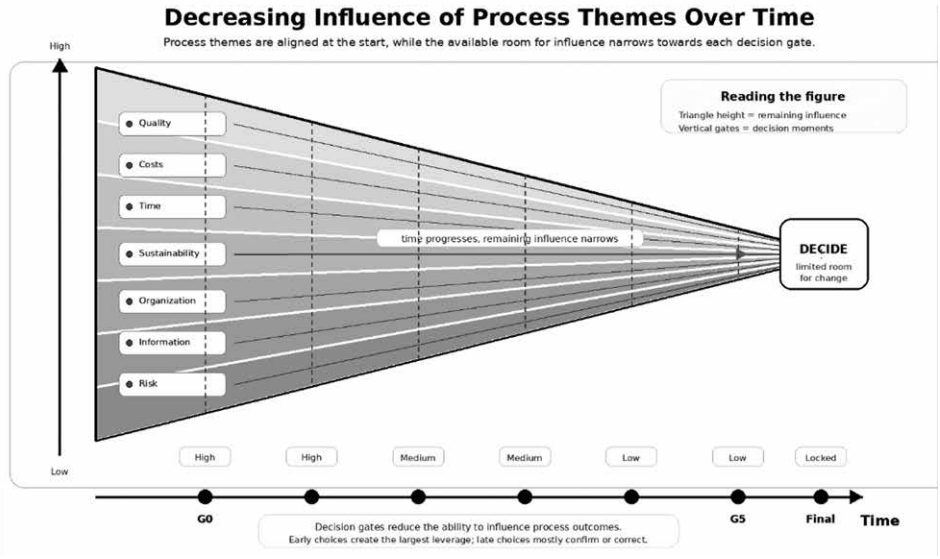


Figure 1.3 Construction process management[1]

1.4.1 Market Conformity

The term “market conformity” is frequently used in negotiations and agreements. Interestingly, this term often leads to considerable debate, suggesting that it might not be suitable as a contractual element. Market conformity is determined at the moment a transaction occurs. However, prior operations are designed to reach certain decision points and are thus intended to assess feasibility (go/no go).

Apparently, everything hinges on the market conformity of the final product. Knowledge of this market conformity is therefore one of the most crucial components of comprehensive real estate calculations. The

challenge, however, is that this market conformity must be determined for the future. This 'forecasting' entails risks. By conducting extensive market research and incorporating past experiences, these risks can be mitigated.

1.4.2 Types of Real Estate Development

There are various types of real estate development. Since each type has its own characteristics and requires a certain specialization, the market often distinguishes between different developers. For instance, one developer may specialize in residential development while another focuses on commercial real estate development. Large entities often possess various specializations in-house, enabling them to concentrate on more land-specific developments: land development. Here, all forms of real estate development can converge to integrally develop an entire area.

1.5 Involved Stakeholders

Another crucial aspect in establishing a well-considered real estate calculation is understanding the interests and positions of the various involved stakeholders. Real estate development projects invariably involve numerous stakeholders, each fulfilling their respective roles in the process and often prioritizing their own interests. Ideally, the interests of the different players align, however, in a process involving significant financial investments and numerous visible changes to the environment, there will be considerable tension among the stakeholders involved. Such tension is not entirely negative, as it can lead to achieving the optimal result by keeping the stakeholders sharp and focused throughout the process.

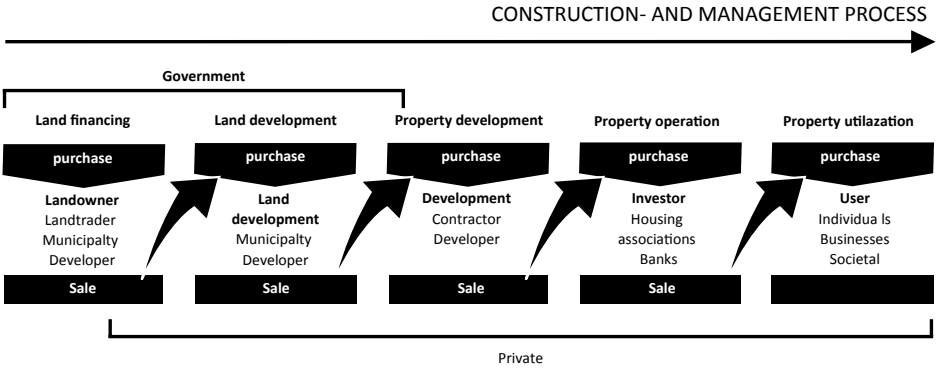


Figure 1.4 Construction Process and Stakeholders.

To provide more insight into the different interests, positions, and roles, we will outline the key stakeholders in this section. In the previous section, we presented a process diagram that logically sequences the various operations. For each operation, several potential stakeholders can be identified. It should be noted that this representation is not absolute but serves to support the understanding of the different interests.

1.5.1 Government

The government plays a pivotal role at various stages throughout the development and realization process of real estate projects. It bears the societal responsibility for shaping policies that determine the appearance and functionality of the built environment. Different levels of government each have distinct roles and responsibilities within this process.

Supranational Authority

Similar to European regulations, such as procurement rules, supranational authorities can significantly impact the development chain, including financial aspects. Additionally, environmental legislation from these authorities exerts considerable influence on real estate development. For example, the African Union promotes unity and development across African countries, impacting policies related to infrastructure and environmental standards. In South America, the Union of South American Nations fosters political and economic integration, influencing regional development projects. In Southeast Asia, the Association of Southeast Asian Nations enhances cooperation among countries, affecting regulations on trade and environmental protection. The Gulf Cooperation Council coordinates economic and environmental policies among its member states in the Persian Gulf, impacting real estate development. These factors are often beyond the control of individual developers, shaping the regulatory environment in significant ways.

National Government

One level down, every real estate development involves the national government. This is where the initial influences in the field of Spatial Development (SD) come into play. The Ministry of Infrastructure and the Environment have a significant, if not the most significant, impact on all development activities in the Netherlands. Although the high level of scale might suggest that the influence of these policymakers is minimal, the opposite is true. The preparation for decisions by the ministry occurs at

Fundamentals of Real Estate Financial Analysis

How do you determine whether a real estate project is truly financially viable? Real estate financial analysis is essential. This introductory guide provides the key tools and insights you need to understand and substantiate the financial feasibility of every stage of real estate development: from planning to implementation.

Financial insight at every stage of real estate

For each phase of real estate, from development and construction to asset management, the relevant feasibility and operating calculations are explained in detail, step by step, with practical examples. The book also includes a chapter on calculating sustainable real estate: how do you account for topics in sustainability such as the energy transition, circular real estate, nature-inclusive development, and climate adaptation from a financial modeling perspective?

The practical, case-based approach makes this book highly suitable for academic programs, professional training courses, and self-study.

Recommendation

"Behind every successful project lies a financial reality of costs, revenues, risks and returns. Understanding that reality is indispensable for anyone working in our field."
Harm Janssen, CEO BPD Europe



About the author

Jeroen de Jong is teamlead Area Economics at BPD Bouwfonds Development, where he is responsible for land development feasibility studies, strategic land acquisition support, location management, and portfolio management. He is involved daily in residential development plans of various sizes and stages. Jeroen is also a lead lecturer in real estate financial analysis at SPRYG Real Estate Academy

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