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PAM - Development of a Privatisation Analysis Model

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## Abstract

*Abstract Dissertation Reddehase, Rainer: Systematization of housing privatisation of portfolios with more than 50,000 units in Germany – Development of a Privatisation-Analysis-Model - [Dissertation] - Technical University of Ostrava - Faculty of Economics - Supervisor: Prof. Ing. Jaromír Gottvald, CSc.*

The aim of the thesis is to examine the mass valuations of large housing stock, taking into account housing privatisation measurements at a later stage (2<sup>nd</sup> order privatisation / housing privatisation).

Starting point of the analysis is data on case studies of the sales processes of the large housing companies (1st order privatisations). The data was collected in Germany between 2000 and 2008. The housing companies examined held between 50,000 and 140,000 housing units. In the course of Due Diligence processes more than half a million housing units were analysed.

Data from the sales processes (bidding procedures) was collected and evaluated and from the observations and conclusions best practice were derived. The process presented here, is described as the privatisation analysis model PAM. The result of the investigation is a PAM report with a results database connected to it.

Development of probabilistic pricing model for residential real estate portfolios: The underlying stochastic model of real estate portfolios transactions is based on the calculation of price indications for immotops with the beta distribution.

Bases for the property valuations are the standardised methods: comparative approach, cost method and income approach. Within the scope of the investigations, the focus was on the micro and macro markets, respective building types and the occupants. Here it was differentiated between desktop valuations on the one hand and drive-by valuations on the other hand. Partly also interviews with tenants were conducted.

In addition, the added value generated is examined scientifically as well as in proactive respect. Furthermore, the substantiation and methodology of the analysis is underpinned and described.

The central questions resulting from the analysis were formulated in hypotheses and theses. The actual investigation includes a practical part i.e. the privatisation analysis model as well as a theoretical part comprising the presentation of property valuations and the determination of the Topic price.

As a result, the dynamic effects of real estate valuation lead to a cost-effective solution for investors. 1,000, 10,000 or 100,000 housing units can be valued in a relatively short time span. Already during the purchase inspection (1<sup>st</sup> order privatisation), the potential for tenant privatisation (2<sup>nd</sup> order privatisation) is assessed more closely.

Keywords: privatisation, housing privatisation, property valuation, real estate valuation, mass valuations, Due Diligence, privatisation analysis model, pricing models, privatisation priorities, housing

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# 1 Introduction

## 1.1 Changes in the real estate market

In the housing industries and real estate markets of advanced industrial states take place deep changes: real estate transactions undergo a transformation from supply-driven markets to demand-driven markets. This is also the case in the letting and leasing markets. In addition, real estate funds boosted ownership transfers to Investment Companies (KAG). With the emergence of the European Union (EU) and the rapid globalisation of markets the need for regulating and standardising the determination of monetary values (costs, prices and yields) of properties has grown significantly. The definition of monetary value comprises both monetary value and use value. This thesis, however, only deals with monetary values not use values.<sup>1</sup>

The determination of costs, income and property prices<sup>2</sup> is regulated by different directives in the various EU countries, but also for German credit institutions,<sup>3</sup> such as savings banks of Federal States. Volks- und Raiffeisenbanken (German Cooperative Banks), however, are regulated by directives issued by the Federal Association of German Cooperative Banks [BVR]. Here the focus on the market value (Verkehrswert, German market value) and the mortgage lending value determined by valuation experts in course of property transactions plays an important role. The latter includes a use value analysis and the determination of the monetary value.<sup>4</sup> This proven method has great advantages. It ignores the left and right values in the spread of property prices, which can become relevant in the marketing process. As a rule, prices tend to move below market value towards the depreciated replacement cost, i.e. the cost-based price in the case of high supply and the stagnating demand. When is demand strong and supply is weak income value and market value are often exceeded. Here analytic appraisal of the price distribution comprising depreciated replacement cost (cost-based price), income value (rental value) and market value considerations based upon probability theory applying adequate mathematic models plays an essential part.

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<sup>1</sup> The use value reflects the suitability of a product for its usage. See Oppitz 2000

<sup>2</sup> Mortgaging of real estate as securities usually serves the purpose of financing building investments, if the debtor has no collateral to secure the credit against potential insolvency risk.

<sup>3</sup> The Regulation on mortgaging and the Act on mortgage bonds, in particular Section 16 (1), (2) of this Act contain directives on determination of monetary value of a mortgage.

<sup>4</sup> The value of a product in economic terms has two sides: monetary value and use value. This dissertation does not deal with determination of use value of land, such as in: Oppitz 2000. In this respect it deals with the monetary side of valuation and property disposal only.

Regarding total rental costs, operating costs are increasing in share and are playing a more important role in relation to net rents. Due to this reason, it becomes significantly more important, to orientate property valuation – using proven methods - increasingly towards global market requirements. This should be undertaken by using information technology (IT), digital data bank systems, and probabilistic models. These processes of including legal issues and mortgaging, also regarding property transaction processes in other countries,<sup>5</sup> also raised valuation issues on international level. Modelling monetary valuation of properties is a multi-faceted task; its results and meaningfulness are determined by many independent and dependent variables. Classic property valuation methods are derived from the models based on monetary values. The further development of the multi-faceted determination of monetary values is the topic of this thesis.

Still before mortgaging a property through a secured loan, it is necessary to determine its mortgage lending value<sup>6</sup> considering the supply and demand derived from market value, risk deduction, cost-based price, rental value etc. As a rule, mortgages are granted up to sixty to ninety per cent of the market price,<sup>7</sup> in special cases also up to hundred and thirty per cent. The higher risk level associated with the higher loan-to-value rate leads to higher interest rates. According to the Act on Credit Institutions<sup>8</sup> (KWG) and the Act on Mortgage Bonds (PfandBG) the mortgage loan cap for the book share of the loan "is limited to only up to the first 60 per cent of the monetary value of the property determined by the bank".<sup>9</sup>

Two options to divide up<sup>10</sup> the loan with various interest rate, payment and repayment options within different book portions up to a legally defined upper cap<sup>11</sup> and a further even higher (possible) share are allowed without any notification on the conditions of these shares. The division into these shares is necessary, since from the legal point of view the supervision the book share is considered as lower risk due to lower legally defined loan to value cap, which consequently requires lower equity levels by the lender.

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<sup>5</sup> According to the German Law on Foreign Trade occupational transactions are free of approval; however, legal terms regarding rent and operation costs in foreign economic areas and rights regarding rents and operating costs between residents and foreigners can be limited. See Sections 22, 23 AWG

<sup>6</sup> "A loan property on the valuation day between a lender willing to sell and a borrower willing to purchase, after appropriate loan period, can be sold in an arm's length transaction, when both parties act with due knowledge, prudence and without any pressure". PfandBG, Section 16

<sup>7</sup> If the probability, that the repayment of the transactions can be carried out, is proven, the commercial banks savings banks and building societies grant a loan to value ratio of up to eighty per cent, instead of the usual sixty per cent.

<sup>8</sup> See also Section 21.3.1 KWG

<sup>9</sup> See also Section 14.A1 and Section 16.1 and Section 2 PfandBG

<sup>10</sup> There are two loan contracts concluded with principal secured in the land register on which lenders usually insist upon, as this determines in the case of foreclosure the division of claims among creditors.

<sup>11</sup> For residential properties in a different EU state the loan to value cap legally defined by the supervision authorities may be taken over, the same competition conditions exist within the EU!

According to Basel III regulations the market price needs to be verified at least once in three years for residential and yearly for commercial properties. Lenders themselves may calculate the market price of residential properties complying with the requirements of the Act on Mortgage Bonds (PfandBG). Closed-end and open-end real estate funds are regulated by the German Civil Code (BGB)<sup>12</sup> and by EU regulations on movement of capital for funds.

At the same time the internationalisation of real estate industry<sup>13</sup> support the diversification of real estate funds. They mainly comprise indirect property investments via real estate ownership in closed-end funds<sup>14</sup> or holding shares of open-end real estate funds.<sup>15</sup>

Indirect investments in properties changed real estate markets significantly. Property formerly traded as classic merchandise (located in a fixed, accurately described location), were transformed into a so-called „immotops“. Besides traditional property ownership modern forms of residential ownership emerged.

The term „immotop“ is derived from the words Immobilie (property) and tópos (location). It was introduced to real estate research at the end of the 20th century in connection with determination of the use value of properties.<sup>16</sup> It is defined as the total of all properties legally owned by one owner in an enclosed area, registered as a property via its use value, monetary value and land value (see Table 1.1).

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<sup>12</sup> Agreement of the claimant and the other party, occurrence of legal change and its entry in the land register (Section 873 BGB); notarial attestation of contract, through which one party commits itself to transfer or attain the land ownership (Section 313 BGB); conveyance of property that has to be declared at a notary at the simultaneous presence of both parties and may not take place under a condition or time determination (Section 925 BGB).

<sup>13</sup> The extra-European share shall be increased from 8 % through investments in the USA, Canada etc., and also in Asia-Pacific area to up to 25 %; an early legal regulation on so called "Old funds" within the 4<sup>th</sup> Law on Support of Financial Market would be in line with the opinion of Board of Directors. See DIFA

<sup>14</sup> The Association of closed-end real estate funds (VGI) with 18 members, e.g. banks, issuing houses, agents, has at its disposal fund volume of approx. €35bn. The VGI comprises through the Federal Association Freier Immobilien- und Wohnungsunternehmen (BFW) important market players such as AWD, Bonnfinanz, Dr. Ebertz, Fundus, Realis, KapHag.

<sup>15</sup> The open-end fund "Offene Deutsche Immobilien Fonds AG [DIFA]" recorded approx. €2.9 bn net cash inflow from 18 property purchases with about €1.7 bn. With €14.9 bn the highest net cash inflow in the history of the industry was recorded, DIFA-Funds recorded approx. 19.5 %. See DIFA

<sup>16</sup> See: Oppitz, V.: "Nutzwertanalyse von Immobilien". In: Grundstücksmarkt und Grundstückswert, Journal 2/2000

*Table 1.1 Characteristics of an Immotop (cluster)*

<b>Property</b>	<b>Registration</b>
Owner	Public authority
Number $a$ and size $Q$ of apportioned land parcels of location (Tópos)	$a = 5$ land parcels, $Q = 2.000$ m <sup>2</sup>
Number of buildings and flats	4 buildings, 12 flats
Depreciated replacement cost	1,400,000 €
Income value	1,600,000 €
Comparative value	1,500,000 €
Market value	1,700,000 €

Project: Merz, K. Real estate agent. Karlsruhe 2017

All analyses and calculations of use values (location, characteristics, etc.) and monetary values (prices and costs) are based on the immotop.

*Figure 1.1 Immotop near Karlsruhe (example)*



Photo: Merz, K. Real estate agent. Karlsruhe 2017

The picture shows an immotop near Karlsruhe. On a connected site (several land parcels) four buildings are located. The buildings are of different age. The buildings are owned by a single owner and are managed jointly (cluster).

A real estate portfolio generally consists of several immotops. The value of the buildings and structures of the immotop include acquisition, construction or investment costs, which are not

connected to the land value, and thus remain unaffected by it. They are influenced by the following relevant factors: investment expenditures cost of the building services and annually recurring incoming and outgoing property-related payments. These are generally not related to the immotop ownership itself, but to the use of the immotop.

Thus each immotop is linked to a systematic data collection and the processing of commercial, legal and technical data over the entire property cycle (see Table 1.2).

*Table 1.2 Characteristics of individual land parcels of the immotop*

<b>Property</b>	<b>Registration</b>
Zoning of land parcel	
Valuation date	
Valuer	
Property description	
Buildings and structures	
Land use	
Year of purchase	
Year of construction	
No. and size of the land parcel	
Development phase	
Quality of site	
Suitability for construction	
Permitted use	
Charges and rights	
Residential area [m <sup>2</sup> ]	
Office area [m <sup>2</sup> ]	
Commercial area [m <sup>2</sup> ]	
Sales area [m <sup>2</sup> ]	

Source: Own design

The immotop represents the price-based and cost-based surface of real estate. In this respect, the determination of monetary value of an immotop consists in systematic acquisition of digital data and information preparation on business, legal and technical aspects of real estate business starting from founding through fixed assets accounting up to operation, maintenance, renewal and commercialisation of real estate.



The investments in technology, modernity, the building and amenities (refurbishment and maintenance) will only pay off during the transaction, when fixed costs<sup>17</sup> in relation to use value and operating costs<sup>18</sup> can be reduced in relation to the transaction price. However, this is not always the case regarding the modernisation of existing stock. Especially in the case of high land values, demolition might be a more favourable option.

That is valid not only regionally. Especially in view of the European integration it is important to enlarge one's market shares and to win a top position in international competition. This improves the profitability significantly.

The changing markets lead to significant requirements for the real estate industry. Investors push new constructions and modernisations of properties. They invest substantial financial sums. On the other hand, the attraction of properties increases with higher technical and telecommunication standards.<sup>19</sup> Currently permanent overlap building services and services not directly related to the building takes place. The technological equipment and related services not directly linked to building now often represent building services.

In the research model of this thesis the classic determination of monetary value of land is investigated and expanded by means of models based on probability theory. This means the determination of monetary values by probabilistic while considering land and buildings as a unity i.e. immotops.

These immotops are derived from:

- the analyses of monetary value of land, building and building services not linked to the building,
- cost and price structures, such as management and operations cost, market prices, rents.
- presentation and evaluation of digital data in a model system.

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<sup>17</sup> Costs that are considerably independent from operating properties and thus remain unaffected. They are influenced by the following factors: investment expenditure, operating costs and the annually recurring property expenses incurring through the ownership itself.

<sup>18</sup> Property costs incurring more or less continuously in the course of property management depending on the efficiency of the management, e.g. wages and repair costs, management cost or activities covered by the operating cost.

<sup>19</sup> Originally for living and operating a property it was sufficient to have a site on which a building was erected. Ovens fed by wood or coal represented more or less a small technical facility of a house. Nowadays there are several building services installed to operate buildings supplying them with heat and warm water including double-walled vacuum provided oil containers, heaters and solar thermal equipment. In addition there are satellite tracking stations, electricity supply, internet connections, computer-aided telephone switchboards, infrared-controlled garage doors, entry areas secured by photoelectric barriers or even video camera monitoring the property.

For determination of Topic prices<sup>20</sup> of the property the following conclusions can be made:

- Monetary value of developed land is to be determined considering buildings and TGA as a unity.
- Specification level and fit-out and the so called „second rent“ (ancillary costs) to related to them are the dominant indicators of the market position of a property.
- The efficiency of disposal, letting and leasing can be predominantly improved through upgrading the building services of the property.

The relevant components of disposal include property modernisation and maintaining the technical facilities of the assets. It is related to the following question: which parts building should have priorities regarding modernisation?

The answer to this question should take two basic criteria into consideration: *firstly*, they are influenced by marketing effects, *secondly* the building services to be modernised should have a low remaining life time in order to secure the economic reproduction through disposal, and thus profitability of the capital employed. The analysis of these relations leads to profound insights: the original property consisting nearly to 100 per cent of building and land was now converted into property comprising mainly – approx. 50 % technology (building services costs).

The reasons of development of probabilistic analysis of property prices and costs lay in the internationalisation of supply and demand markets! Under the changed market conditions profitable disposal of immotops requires attractive and professional marketing, competitive prices and cash flow management. Investors expect professional commercial management with a clear business plan including costs and monetary value structures. Classic methods to determine the monetary value of properties<sup>21</sup> should be extended by the implementation of valuation methods based on probabilistic modelling of monetary values.

In addition, the models can partly be considered as a basis the mortgage lending value. Here also normative property valuations are included.

On the German market the sales of large housing companies attracted great attention. Large numbers of apartments were sold in bidding procedures: in 2000 114,000 rail workers' flats were sold, GAGFAH, Essen in 2004 (82,0000 flats), GSW, Berlin in 2004 (67,000 flats),

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<sup>20</sup> The Topic price is defined as the professional and mental ability of market participants to get involved in a polemic reconciliation of interests in the privatisation of real estate portfolios and their market-oriented willingness to come to a mutual agreement in the search for guidance regarding the optimal transition of ownership.

<sup>21</sup> Determination of German market value [ImmowertV], German income approach, discounted cash flow [DCF] method, etc.

Viterra, Bochum in 2005 (140,000 flats), WOBA Dresden in 2006 (50,000 flats) and LEG NRW in 2008 (93,000 flats). These transactions with generally more than 50,000 apartments included extensive Due Diligence procedures.<sup>22</sup>

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<sup>22</sup> See Vogt, G. P. 56

## 1.2 Definitions

Privatisation is defined as follows:

1. Privatisation of the 1st order: Sale of (state-owned or community-owned) housing companies. Often the whole company (share deal) is sold. Sometimes only the real estate portfolio is sold.
2. Privatisation of the 2nd order: separate sales of apartments or immotops. According to the Wohnungseigentumsgesetz (Commonhold Act) commonhold flats, splits into partial plots in the case of single-family and terraced houses or sales of entire properties (e.g. sale of multi-family houses) are treated differently. The following text deals with privatisations of the 2nd order including tenant privatisation.

Politically the sales of publically owned housing companies were always extremely controversial. On the one hand there was talk of „selling off the family silver“, and necessity to provide broad sections of the population with housing. On the other hand finance policy-makers did not deem to see the need, to hold such volumes of housing anymore. As housing stock has aged, there is a high need for repair and modernisation measures. So the stock did not only represent hidden assets but also a backlog of burdens.

Do the six sales of real estate portfolio represent a privatisation of the 1st order? In nearly all transactions the seller was a public authority. In the sale of Viterra the owner was the energy group E.ON. E.ON is a merger of VEBA and VIAG, i.e. former state companies privatised several years ago.

Up to now no standard publication on housing privatisation or tenant privatisation exists in Germany (GER), i.e. the conversion of tenanted flats into commonhold flats. Also the „Handbuch Wohnungsprivatisierung“ (Handbook on Housing Privatisation) is not very useful, since it represents a guide to IT-based sale management programme.<sup>23</sup> However, several works on privatisation of housing stock in line with the Altschuldenhilfegesetz (Law on Assistance with Old Debts, only effective in the new federal states<sup>24</sup> and Berlin)<sup>25</sup> were published, however they represent only partial aspects of this transformation (e. g. legal aspects).<sup>26,27</sup>

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<sup>23</sup> See Reifenrath, F. P. 1 ff.

<sup>24</sup> See Plesse, H. P. 1 ff.

<sup>25</sup> See Steinmetz, F. P. 1 ff.

<sup>26</sup> See Ruge, N. P. 7

<sup>27</sup> E.g. independent and dependent variables of the purchase decisions regarding the conversion of commonhold flats. See Striedinger, D. P. 7 ff.

There are various works on real estate valuation (standardised and international procedures)<sup>28,29,30,31,32,33</sup>, though, and much literature on merger and acquisitions (M&A),<sup>34</sup> Due Diligence and valuations of individual properties of housing stocks or comprehensive valuations of real estate portfolio.<sup>35</sup> Especially the work by Hass is worth mentioning.<sup>36</sup> However, it also lacks the verification of the suitability of housing for privatisation; i.e. it lacks an important driver of the monetary value.

Several studies and analyses on the motives of public authorities to pursue privatisations were conducted.<sup>37</sup> Among others Livia Leipold in her research on the motives of the city of Dresden dealt with sale of the WOBA Dresden.<sup>38</sup> In my thesis I intend to focus on the motives of the purchasing party to a lesser extent.<sup>39</sup>

From the point of the purchasing party the focus is on the valuation of the housing stock and the corresponding financing model. The author participated as a project leader of the “Due Diligence Team Tenant Privatisation” in large biddings for real estate portfolios by public authorities.

Thus, the actual investors’ financing models [Financial Model] are only indirectly in the focus of the thesis.<sup>40</sup> At the same time this thesis does not deal with commercial properties, but only with residential properties. From the analysed multitude of large and small residential real estate portfolios of residential real estate the valuation criteria have emerged. Here existing valuation procedures of valuations of individual immotops of housing stock or comprehensive valuations of real estate portfolio were developed further. The experience gained - from the REAL ESTATE STUTTGART Chartered Surveyors GmbH, Stuttgart - will be generalised and the

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<sup>28</sup> See Kleiber, W. (1996) P. 171 ff.

<sup>29</sup> See TEGOVA

<sup>30</sup> See Bayerlein, W. P. 4 ff.

<sup>31</sup> See Kleiber, W. (2010/2) P. 1 ff.

<sup>32</sup> See Metzger, B. P. 1 ff.

<sup>33</sup> See Garthe, Th. P. 11 ff.

<sup>34</sup> See Schramm, M. P. 3ff.

<sup>35</sup> See Brühl, M. P. 193ff.

<sup>36</sup> See Haas, St. P. 26

<sup>37</sup> See Heyda, R. P. 1

<sup>38</sup> See Leipold, L. P. 1 ff.

<sup>39</sup> Privatisation includes the cooperation between public authorities and private businesses regarding housing development, but also involves the privatisation of the financing of public services, where private capital enables public investments e.g. the application of concession models or conducting sales of receivables, and leasing financing.

<sup>40</sup> See Matzen, F. P. 203 ff.

best practices will be highlighted.<sup>41</sup> In practice all this leads to a privatisation analysis model (PAM).<sup>42</sup>

Analogue to spread sheet-based financing models,<sup>43</sup> one may speak of valuation models. This is a standard practice in the course of privatisations of publicly owned immotops. The relevant decision-making parameters are aggregated. Pricing models based on probability theory are being included into the financial models of the investors: „Company transactions are regularly the result of multi-faceted business decisions that require thorough preparation and a profound decision-making base. It is necessary to collect and aggregate a large number of information relevant for decision making in order to make a clear-cut statement on advantages of this transaction. Real estate related literature often applies programmed models. The models should reflect an investment and financing plans and provide a profound, fact-based foundation for decision-making. All significant decision-making relevant parameters should be considered and made transparent.

They should be flexible enough especially in the fields M&As and transactions, in order to take continuous inflow of new information as early as possible into consideration. Lastly, they should reduce the extensive database to a few financial indicators,<sup>44</sup> so that they can be presented to supervisory boards and boards of directors for decision-making.<sup>45</sup>

On basis of these results and with regard to an expected increase of insights, the following model concept will be applied in line with standard privatisation practice of publicly owned immotops:

*Probabilistic pricing model of residential real estate portfolios!*

The concept reflects some connection with the Anglo-Saxon „spread sheet-based financial model“ (in short „financial model“). Whereas the financial model is mainly based on planning, financing and valuation models predominantly related to spread sheet programmes, such as Microsoft Excel, the model above will further develop best proven European valuation methods with help of probability theory in order to meet the requirements of globalised capital markets. This requires above all the improvement of the dynamic bidding procedures for those real estate

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<sup>41</sup> In 2003, the author founded REAL ESTATE STUTTGART Chartered Surveyors GmbH, Stuttgart, Germany. The business segments include the areas of due diligence, privatisation and consulting.

<sup>42</sup> Privatisation of residential property analysis model.

<sup>43</sup> Spreadsheet based financial model.

<sup>44</sup> Key Financials.

<sup>45</sup> See Prüher-von Au, M. P. 65 ff.

portfolios that suitable for an internationalisation of property privatisation by domestic and foreign investors. So far it exists no equivalent term in German for such a model. In the course of the development of a monetary value model based on probability theory for properties, the traditional German income valuation method to determine market value needs to be incorporated, but also the Anglo-Saxon DCF method should be considered.

As in any process of exchange of goods also supply of and demand for property meet. Also the capital and the real estate market represent a polypoly, however, with an important difference to the other goods market, due to the specific use and immobility of properties. Because of these special qualities it may happen that properties located in rural areas have lower market values than their depreciated replacement costs due to a lack of demand, whereas comparable properties in central city location can have market values that are significantly higher than its depreciated replacement cost due to their location and high rental income.

This shows that the real estate market consists of many regional sub-markets. They differ not only in their topographic location, but also in their infrastructure quality, their social structure and demographics, development density. But also differences regarding financial strengths, land prices and consumer goods preferences play an important role.

Consequently, real estate transactions differ from the model of a perfect market quite strongly due to the use qualities of properties. Properties offered on the market are for example very different in type. Due to this lack of unity differing preferences regarding specific property types or locations develop e.g. personal, structural, or time-related preferences.

Due to usually long sale periods and useful lives supply and demand of properties can respond to fluctuations in prices and use value only with a considerable delay. Changes in supply (dependent variable) in the real estate market responding to a change in demand (independent variable) are very small in comparison to a perfect market.

Another constraint of real estate markets is the small number of sellers and buyers in the sub-markets. But also the high numbers of different sales strategies in the regionally structured sub-markets contribute to a lower the transparency of property supply. That means: instead of a real estate market numerous regional sub-markets exist, but also sub-markets structured by type of use which leads to further constraints in property transaction processes.<sup>46</sup>

In the privatisation processes of large portfolios mostly multistep bidding processes are applied. In the first round only a teaser is distributed. Bidders, who manage to reach the second round,

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<sup>46</sup> See Gondring, H. (2009) P. 341 ff.

receive an investment memorandum and access to a data room in order to verify transaction data.

Investors (buyers) choose a regional sub-market and check the investment memorandum. This procedure supports strong competition between buyers. Eventually only one investor – or group is able to purchase a housing company or real estate portfolio successfully.<sup>47</sup>

## **1.3 Research object**

### **1.3.1 Explanation**

Since 2000 many large housing companies or immotops have been sold in Germany. The publicly owned immotops (on federal, federal state or community level) were privatised. But large industrial companies disposed of their immotops. Buyers were mostly international financial investors. This thesis analyses and systematises the largest biddings for real estate portfolios sold by public authorities (volume 50,000 and more flats) in Germany. At the same time, it will be investigated how different immotops can be valued during the purchase process. In the course of the investigation of individual valuations of immotops or comprehensive valuations of real estate portfolios it will explicitly differentiated between immotops suitable for the block sale and residential properties suitable for tenant privatisation (conversion of tenanted flats into commonhold flats).

A special focus shall be given to the bidding for rail workers' flats, Bonn (sales year 2000, 114,000 flats), for GAGFAH, Essen (sales year 2004, 820,000 flats), GSW, Berlin (sales year 2004, 67,000 flats), Viterra, Bochum (sales year 2005, 140,000 flats), WOBA, Dresden (sales year 2006, 50,000 flats) and LEG NRW, Dusseldorf (sales year 2008, 93,000 flats). Also during the sales of real estate portfolios including less than 50,000 flats due diligence processes<sup>48</sup> will be carried out, though not as extensive as in the course of large transactions.

It is very important to consider that transactions include on the one hand a change in legal form, and on the other hand a gift or barter. Sales of publicly owned property to investors are different. It is necessary to clearly differentiate this in order to constitute whether either a change in the legal ownership form or a complete change of ownership (privatisation) took place.

The research topic is extremely topical, since major changes of ownerships of real estate portfolios are likely to be observed in Germany again. Along with initial sales the purchaser of

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<sup>47</sup> See Gondring, H. (2009) P. 341 ff.

<sup>48</sup> „Due diligence“-method from the practice in the course of mergers and acquisitions.



GSW, Berlin went public in April 2011.<sup>49</sup> LBBW Immobilien, Stuttgart, was available for sale in February 2012. The RAG-Stiftung (RAG-foundation, established by the FRG and the federal states of North Rhine Westphalia and Saarland) decided on an IPO of the Evonik group, which is holding 130,000 flats.<sup>50</sup> For this purpose the housing companies THS and Evonik Wohnen, held by the group, merged at the beginning of 2012 into the housing group Vivawest.<sup>51</sup> Further secondary sales will follow. The sale of WOBA Dresden to GAGFAH was of much public interest. The former owner of the immotop, the City of Dresden, claimed a contractual penalty of € 1bn in March 2011 from the GAGFAH-Gruppe due to a breach of the agreed social charter. The negotiations on settlement at the beginning 2012 ended with a failure.<sup>52</sup> In March 2012 the parties arrived at a settlement. In May 2013, the Bayerische Landesbank sold its equity stake in the housing company GBW AG holding 32,000 flats in Bavaria. In 2013 Deutsche Annington went public, the largest housing company in Germany. The Deutsche Annington became Vonovia, which meanwhile bought GAGFAH including WOBA Dresden and Südewo (formerly LBBW Immobilien).

Based on the analysis and systematisation of the largest biddings for real estate portfolios sold by public authorities (volume 50,000 and more flats) in Germany, criteria will be derived of regarding the valuation of immotops in the context of Due Diligence processes. Thus, databases of Due Diligence processes will be evaluated.

Here the challenge is that flats within an immotop (assets<sup>53</sup>) represented in the bidding of real estate portfolios are very different in structure (different construction years, building types, flat sizes, room numbers, etc.) and the immotops are situated in different locations and regions.<sup>54</sup> An individual valuation of all properties included in the portfolio does not deem reasonable in such large transactions also for cost reasons. Another reason is the tough timeline of the bidding process (Due Diligence process),<sup>55</sup> during which approximate monetary values of flats must be determined and the immotops need to be examined according to their conversion potential (i.e. privatisation of the 2nd order – tenant privatisation).<sup>56</sup> The generalisation of criteria allows

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<sup>49</sup> See Rebhan, Ch. Source: <http://www.immobilien-zeitung.de/1000003260/gsw-aktie-geht-zum-mindest-price-ueber-tisch>

<sup>50</sup> See Süddeutsche Zeitung Source: <http://www.sueddeutsche.de/f5V38m/4030753/Evonik-darf-an-die-Boerse.de>

<sup>51</sup> Source: <http://www.wa.de/nachrichten/kreis-unna/bergkamen/wurde-vivawest-1556546.html>

<sup>52</sup> Source: <http://www.immobilien-zeitung.de/113574/woba-mediation-gescheitert>

<sup>53</sup> Assets: in general investment, invested capital, here ownership in the bidding processes of real estate portfolios investigated

<sup>54</sup> See Heuer, J. P. 22 ff.

<sup>55</sup> See Gondring, H (2010) P. 341

<sup>56</sup> See Buchner, F. P. 971 ff.

finding suitable valuation approaches for prospective privatisation measures of housing companies (privatisation of the 1st order – sale of former publicly owned companies or privatisation of national property). In Germany state companies own currently over 3 million flats.<sup>57</sup>

Large biddings for publicly owned real estate portfolios mostly occur, when public authorities need to dispose of housing stocks for commercial reasons.<sup>58</sup> Industrial and energy companies, however, also dispose of their flats when they become obsolete.<sup>59</sup> In order to comply with the Gesetzes gegen Wettbewerbsbeschränkungen (Act against Restraints of Competition) and due to international agreements, but also to achieve maximum sales results, the sales are organized in the form of international biddings. National and international investors have the possibility to bid for these housing companies.<sup>60</sup>

Due to complexity of sales of real estate portfolios bidding procedures are highly structured.<sup>61</sup> In the case of large transactions, vendors instruct sales teams.<sup>62</sup> Due Diligence experts, with expertise in the areas business, tax, law, environment, technology and others, investigate within Due Diligence processes the opportunities and risks of transactions. As the real estate portfolios examined comprise residential properties, the Due Diligence includes besides lawyers, auditors, tax advisors, bankers also real estate experts and architects for the technical Due Diligence. Purchasers also instruct at least at an advanced stage of bidding processes Due Diligence teams.<sup>63</sup> In order to submit a bid, bidders (in practice often private equity funds) develop financial models with the help of their advisors (structured financing, useful life, debt ratio, leverage effect), which serve as decision-making tools for the investment committees of the financing banks.<sup>64, 65</sup>

The monetary value of properties results above all from the existing real estate stock of the companies i.e. the flats, lease agreements and rental income. Consequently, this is the focus of the Due Diligence. Since in the course of valuing the flats, it is also examined to which level it is possible to privatise them (privatisation of the 2<sup>nd</sup> order), standard valuation procedures can

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<sup>57</sup> See Gondring, H. P. 350

<sup>58</sup> See BBR-Berichte, P. 3

<sup>59</sup> See Tagesspiegel Source: <http://www.tagesspiegel.de/wirtschaft/finanzinvestor-kauft-150000-wohnungen/609052.html>

<sup>60</sup> See Deutscher Städte- und Gemeindebund Source: [http://www.dstgb-vis.de/home/gegenwärtiges\\_news/gegenwärtig/neues\\_gwb\\_vergaberecht\\_in\\_kraft\\_getreten/index.html](http://www.dstgb-vis.de/home/gegenwärtiges_news/gegenwärtig/neues_gwb_vergaberecht_in_kraft_getreten/index.html)

<sup>61</sup> See May, A. P. 374

<sup>62</sup> Vendor Due Diligence.

<sup>63</sup> Buy Side Due Diligence. See Siepmann, A. P. 374

<sup>64</sup> See Gondring, H. (2010) P. 232 ff.

<sup>65</sup> See Reis, J. P. 100

only be applied to a certain extent, regardless the time frame. Thus it is necessary to develop new approaches, methods, and models (financial models).

Empiric research focuses on real estate portfolios as a grouping of various immotops held by one owner. Motivations for the creation of real estate portfolios are:

- either grouping immotops dispersed in various locations and owned by local authorities under unified public management;
- or private investment including several immotops with different opportunities and risks regarding yields and development prospects, in order ensure that investors achieve a balance between sustainable investment and high yields, as well as liquid income via active property management.

In searching for the best possible solution investors must make decisions on strategies to solve the general dilemma that yields and risks behave inversely proportional: growing risk promises higher profit, whilst lower yields mean lower risk. From a research point of view the descriptions of processes are not relevant, but the conclusions correctly drawn from them.

Since the beginning of 2000, a million of flats have changed hands in Germany (see Table 1.3). There were sales of complete real estate portfolios, immotops or tenant privatisation programmes. As a rule, it was necessary to agree with the former owners on a social charter including tenants' protection and protection for employees and workers. In addition, there were restrictions on sales and conditions attached. Originally it was planned to convert the companies into Real Estate Investment Trusts (REIT). Due to German legislation REITs were not allowed to hold residential portfolios. Therefore besides share deals, also partial sales via the stock exchange were conducted (GSW, GAGFAH, Deutsche Annington).

*Table 1.3 Housing Companies with more than 50,000 flats (1<sup>st</sup> order privatisation)*

<b>Owner</b>	<b>Year</b>	<b>No. of Flats</b>
Rail workers' flats, Bonn	2000	114,000
GAGFAH, Essen	2004	82,000
GSW, Berlin	2004	67,000
Viterra, Bochum	2005	140,000
WOBA, Dresden	2006	50,000
LEG NRW, Dusseldorf	2008	93,000

Source: Rottke, N./Rebitzer, D. P. 658<sup>66</sup>

<sup>66</sup> See Rottke, N./Rebitzer, D. (2006), P. 658

### **1.3.2 Rail workers' flats, Bonn**

The sale by the owner the Bundeseisenbahnvermögen (Federal Railway Property Fund, [BEV]) was supposed to take place in 1997. Within the bidding process the Japanese Bank Nomura offered €1bn more than a consortium around the Landesentwicklungsgesellschaften (Development Companies of the German Federal States, (LEG), which was awarded the tender. As this contradicted European law, the sale had to be conducted again. In 2000 the „Deutsche Annington Immobilien GmbH“ held by Nomura purchased 64,000 flats in the second round and LEG purchased the remaining flats. The sales process of the rail workers' flats took more than five years in total. The property stock was distributed all over Germany and was held in and managed by several railway-housing companies. Investors or their transaction advisors were faced with the task to bid in the shortlisting with a tentative price for over 100,000 flats, i.e. to submit an indicative bid. However, not only the purchase price for the real estate portfolio was crucial, but also possible sales strategies. While up to then only companies traditionally specialised on the privatisation of residential properties were dealing with conversions of tenanted flats into commonhold flats, now investors started to take sales in the form of tenant privatisation into consideration. Thus, not only market values were determined, but the housing stock was also examined regarding its potential for tenant privatisation. In addition, it was examined which return on sales can be achieved within which time frame. Each possible target group (lease purchasers, capital investors, purchasers of empty flats) was assigned average sales prices per m<sup>2</sup>, as well as property privatisation ratios per target group. Advisors with expertise in tenant privatisation and with national experience in this field were instructed. The valuations conducted in 1997 were required to be verified in the years following the opening of the bidding process. Thus for example, a Market-Movement-Matrix (MMM) was developed. In the Market-Movement-Matrix purchase price movements and rental growth in the most important cities and towns were analysed. Thus, it was possible to update the existing valuations. After the sale, large-scale tenant privatisation programmes were implemented. At peak times, up to 5,000 flats a year were sold to tenants or the third parties. Sales to the third parties were only possible, after fifty per cent of flats had been sold to tenants. This ratio was later reduced. The social charter obliged the purchases to invest an agreed amount in maintenance. Through further purchases (Viterra) Deutsche Annington became the largest housing owner in Germany. After that the Deutsche Annington, now Vonovia, purchased also the GAGFAH including WOBA Dresden and Südewo and plans to extend its portfolio to more than 1,000,000 flats.

### **1.3.3 GAGFAH, Essen**

In 2004 a huge surge of sales rolled over Germany. The investment company Fortress paid the highest price in a tender for the housing stock, which was distributed all over Germany. Later GAGFAH) was listed on the stock exchange by Fortress. After further purchases i.e. of NILEG, Hannover, GBH, Heidenheim and WOBA Dresden, GAGFAH became the largest listed German housing company. The Bundesanstalt für Arbeit (Federal Labour Office, (BfA)) tried to sell already in 1998 its non-profit subsidiary Gemeinnützige Aktien-Gesellschaft für Angestellten-Heimstätten (GAGFAH) within a bidding process.

Due to resistance by the management the proceedings were cancelled, but reopened again in 2004. Like the rail workers' flats, also this stock of this portfolio was distributed all over Germany. The purchasers accepted comply with the social charter protecting the employees and tenants. For Fortress this acquisition represented its entry to the German market. Further acquisitions of residential, but also commercial properties (Eurocastle) followed. Besides, management of the portfolio, tenant privatisations were conducted in various locations. In addition, multi-family houses are being sold. Meanwhile the company also belongs to Vonovia.

### **1.3.4 GSW, Berlin**

This was a sale to the Whitehall fund held by Goldman Sachs and Cerberus. Only in the third bidding it was possible to sell the GSW held by the Senate Berlin to the Whitehall Fund held by Goldman Sachs and Cerberus. Earlier sale attempts failed due to low bids. The flats were located in Berlin only. Complying with the Altschuldenhilfegesetz (Law on Assistance with Old Debts) these flats converted into the commonhold flats. This law was effective for the housing companies in the new German federal states, but also for the housing companies in West Berlin. The housing companies were required to privatise 15 per cent of their flats in order to get rid of the old debts.<sup>67</sup> Due to a low rental level in Berlin and demographics of the inhabitants tenant privatisations were not very successful. Each year approximately 500 privatised flats were sold to owners-occupiers or capital investors. Currently about 3,000 flats have been already privatised. In 2008 the Whitehall fund also purchased the Landesentwicklungsgesellschaft NRW (Development Company of the Federal State North Rhine Westphalia), holding 93,000 flats. Due to the situation on the market the IPO of the GSW in 2010 was not successful. However, the company went public in 2011. In the meantime, the shareholders sold their GSW-

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<sup>67</sup>. See Steinmetz, F. P. 98

shares completely. Meanwhile the original investors sold their last GSW shares. Meanwhile the company belongs to the Deutsche Wohnen Group.

### **1.3.5 Viterra, Bochum**

The sale of „Deutsche Annington“ was the largest change in housing ownership in Germany since the insolvency of the housing company Neue Heimat.<sup>68</sup> Through the purchase of Viterra Deutsche Annington became the largest housing company in Germany. Before Viterra, or formerly Veba Wohnen, was Germany’s largest housing company. Its flats were distributed all over Germany with a focus on the Ruhr area. Through additional purchases (FSG, Deutschbau) the company acquired housing in further locations. The company developed early on from a pure housing owner to a real estate agent. Due to active property management flats were classified early on and their long-term sales potential was identified. Sales often took place within the framework of tenant privatisation measures. However, larger parts of the portfolio were also sold globally. Within the sales process E.ON stipulated the option for an IPO or the sale to a bidder. The bid by Deutsche Annington amounting to approximately €7 billion was awarded the tender. Meanwhile Deutsche Annington announced several IPOs, but none has been carried out so far. Now Deutsche Annington belongs to Vonovia.

### **1.3.6 WOBA, Dresden**

Through the purchases of the companies Hannover, GBH, Heidenheim and WOBA Dresden now the GAGFAH is the largest listed German housing company.<sup>69</sup> Unlike Berlin the City of Dresden sold all housing companies owned by local authorities. This enabled the City to balance its debts and still achieve a profit of approximately €700 million. After demolishing several thousands of flats the company still held 48,000 flats. The domino effect expected after this transaction did occur. Since the sale of the flats in Freiburg in Breisgau was a fail, politicians were afraid of negative reactions by the electorate. In 2011 the City of Dresden accused the new owner, the WOBA Dresden, of a breach of the conditions of the social charter and the purchase agreement. They claimed a penalty of billions of euros. After mediation and settlement proceedings the parties arrived at the agreement. Maintenance expenditures will be increased and an amount of €36 million divided over 10 years – must be spent predominantly on social projects. In addition to WOBA paid for the legal expenses.

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<sup>68</sup> Neue Heimat (trade union company): after the insolvency in 1986 the rescue company sold 200,000 flats in smaller batches to federal state companies as well as to private investors.

<sup>69</sup> Source: [http://www.mdr.de/sachsen/gagfah104\\_zc-fl179a7\\_zs-9f2fcd56.html](http://www.mdr.de/sachsen/gagfah104_zc-fl179a7_zs-9f2fcd56.html) (reference 25-4-2012)

### **1.3.7 LEG NRW, Dusseldorf**

This was a sale to the Whitehall Real Estate Fund (held among others by Goldman Sachs). The flats are located predominantly in North Rhine Westphalia.<sup>70</sup> The majority of real estate portfolio included former flats of the company Neue Heimat (38,000 flats). Already before the sale tenant privatisations were conducted at individual locations. The acquisition of LEG NRW was the last Due Diligence conducted before the collapse of the American bank Lehman Brothers in 2008.

During the financial crisis, the sentiment on the capital markets deteriorated abruptly, biddings already in process, e.g. the sale of TLG needed to be cancelled. In 2012 signs of larger real estate portfolio transactions appeared on the market, e.g. about 21,500 flats held by LBBW Immobilien GmbH, Stuttgart were sold to Patrizia AG, Augsburg. The flats held by DKB Immobilien AG, approximately 12,000 flats were sold to TAG Immobilien AG, Hamburg and in April 2012 Cerberus bought 22,000 flats of the insolvent British company Speymill.

Further sales of real estate portfolios can be anticipated. For the former large transactions described refinancing is due. The conditions of social charters partially expire, so a further increase in block sales may be expected.

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<sup>70</sup> Source: <http://www.spiegel.de/wirtschaft/unternehmen/0,1518,826551,00.html> reference 2012-04-25]

## 2 Research objectives and tasks

### 2.1 Research focus

The procedure of privatisation of real estate portfolios (privatisation of the first order / 1<sup>st</sup> order privatisation) describes the transactional, legal and material aspects of the transfer process of a real estate portfolio owned by a public authority (asset deal) or of the housing company itself (share deal) into the ownership of an investor, as a rule a natural or legal person. The optimal transaction of real estate portfolios requires the IT application of probabilistic pricing model and the use of the appropriate computing programmes.

The transfer of ownership considered here, i.e. transfer of local public ownership into private ownerships involves both *formal privatisation* and *material privatisation* (see Table 2.1). In general, it represents privatisation of property through disposal of public property.<sup>71</sup> Due Diligence processes of housing companies play an important role here (formal privatisation / 1<sup>st</sup> order privatisation).

Table 2.1 Formal, material and functional privatisation

Formal privatisation	Material privatisation	Functional privatisation
(1 <sup>st</sup> order privatisation)		
Sale of company in public ownership or state-owned to a private or legal person from the private sector	Sale of sovereign public services to private or legal persons from the private sector	State commissioned private companies with the implementation of government tasks. A transfer of the public task itself does not take place.

Source: Juraforum ([www.juraforum.de/lexikon/privatisierung](http://www.juraforum.de/lexikon/privatisierung))<sup>72</sup>

Methodological justification of a price finding strategy should optimise the investment objectives of the real estate portfolio. After validation of the probabilistic pricing methodology best practices should be developed regarding marketing and sales of real estate portfolios, in order to achieve sales objectives. This probabilistic pricing methodology aims beyond the pricing of individual immotops towards fundamental strategic alignment of real estate portfolios. The composition of real estate portfolios changes constantly through an active management strategy (purchases and sales).

<sup>71</sup> See Roßberg, I. P. 103 ff.

<sup>72</sup> See <http://www.juraforum.de/lexikon/privatisierung>



For the methodological justification and implementation of probabilistic pricing methodology it will be necessary identify the following main tasks of privatisation procedures:

- Development of probabilistic pricing methodology and planning the progress of proposal scenario regarding the implementation of the strategic timeframe. The planning can involve the individual immotops as well as real estate portfolio as a whole. It enables to conduct all required statistical tests. The programmed procedure ensures simple access to all data of the business analysis of the real estate portfolio management previously conducted.
- After systematic data collection, the probabilistic pricing models can be used for the budgeting of cost and prices within the framework of company accounting. They contribute to business and financial planning. Mathematical-statistical modelling and computer-aided planning aiming at the strategic analysis of real estate portfolio offers well-founded instructions for selection of targeted privatisation strategies. It integrates privatisation practice procedures.
- In fixed asset accounting the current data of the real portfolio are compared within the framework of an analysis of the current status with the objectives. Probabilistic pricing is used in order achieve a possible improvement of the objective function and the conditions of privatisation. Furthermore, the indicators of real estate portfolio can be compared to capital markets and real estate markets benchmarks and indicators.

The main objective of the thesis is to develop a method of probabilistic pricing for real estate portfolios. The theory is based on the determination market prices (market values) of real estate portfolios and their underlying assets. In addition, findings on tenant privatisation are included. Within the framework of a Due Diligence process the method enables an appraisal of profitability priorities of asset privatisation of large real estate portfolios.

Challenge and research objective of the thesis is to use the results of traditional procedures of real estate valuation to substantiate and develop the pricing methodology from probability theory perspective and thus adjust it for privatisation strategies of public authorities. The objective of the application and implementation of a probabilistic pricing methodology is to support market players in their decision-making process.

For the analysis of the suitability for privatisation and start of the bidding procedure the following aspects are relevant:<sup>73</sup>

- The tough time line in real estate ownership transfers within the bidding processes requires fast progress.
- The expenditures for determinations is to be minimized by means of software solutions, in order to reduce the costs of real estate portfolios valuations and of immotops to a cost-efficient level instead of conducting individual valuations.
- The analyses involve capital market and real estate market considerations (analysis of micro market and macro market), asset level (suitability of house type) and occupier level (financial standing, purchasing power, professional status).
- Determination of privatisation priorities including a criteria model and ranking model.
- Determination of sale prices in the tenant privatisation by target group: tenant, buyer of vacant commonhold flat and investor.
- Preparation of sales periods and ratios in tenant privatisation (sales scenarios)
- Adjustment of databases and external requirements within a privatisation analysis model (PAM).<sup>74</sup>

Real estate markets comprise local sub-markets. The market differs in location, infrastructure quality, demographics and building density, capital strength, land prices and social-cultural qualities. In the real estate transactions supply and demand meet.<sup>75</sup> As opposed to other markets, however, there are capital and real estate market limitations of the commodity. Property are commodities fixed to a location, firstly through being situated in a specific location and secondly by the occupier. The supplier (public authority), however, and the demander (investor) are not fixed to a location: they do not need to come from the region in which the property is located.

Due to specific qualities, real estate market deviates strongly from the model of perfect market. The goods in supply vary significant regarding their transactional, locational, personal and time qualities. Due to the long economic life of properties owners can only respond with considerable time lag to the fluctuations on capital and real estate markets. The capital and real estate

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<sup>73</sup> In addition research can deal with further issues: desktop valuations or drive by valuations, comparable assets from tenant privatisations, prices of buildings in their condition and prices after modernisations, assumptions on building conditions, recommendations on tenant privatisation, assumptions on fluctuation, assumptions on rents of portfolio stock and assumptions on rents after re-letting.

<sup>74</sup> See Geltner, D. (2007) P. 231

<sup>75</sup> See Gondring, H. (2010) P. 92

market adjustment of the supply to the demand is compared to a perfect market very low. In addition, the number of owners and investors is very low in the sub-markets. To sum up: property transactions take place in sub-markets, which increases imperfection of markets.

Due to the underlying market mechanisms supply- and demand-related behaviour is often marked by conflicting interest: the return expectations of the investor influence the pricing of the seller. The objectives of the owner and the investor regarding profitability are naturally conflicting.

The supplier wishes to achieve with the sales the income value plus a bonus. The objective of the investor, however, is to pay the lowest possible purchase price for the real estate portfolio. The investment needs to be profitable. The investor, nevertheless, does not want to be outbid by other bidders. Each party instructed a consultant for the transaction process. The property and company valuation eventually represent the basis for the bidding price. Investors, however, also need to take into account other considerations. Some investors are willing to pay higher market entry premiums. Others profit from scaling effects. Investors with the best strategy are able to pay the highest price. In practice, this sometimes leads to package supplements or as one can say: the pig costs more than the individual chops.

## **2.2 Research question and hypotheses**

### **Research question:**

*Is it possible to develop on the base of mathematical statistics a Topic price for the real estate portfolio with different weightings of the pricing components, that represents a real decision-making tool for purchase negotiations of supplier and investor?*

The Topic price is defined as the professional and mental ability of market participants to get involved in a polemic reconciliation of interests in the privatisation of real estate portfolios and their market-oriented willingness to come to a mutual agreement in the search for guidance regarding the optimal transition of ownership. The qualities of the Topic price are determined by the probability of the three main components of pricing regarding their probability of occurrence in anticipation of assumed negotiation result. The decision basis of the Topic price is the desired balance of proceeds for both supplier and investor.

Thus, the Topic price of a real estate portfolio represents the differing interests of the market players. In general, the topic price links conflicting perceptions of suppliers and investors with expertise of valuers and experts and is based on the analytical data of real estate and capital markets. It does, however, not claim to represent the actual price, but only to represent the price with the

highest probability. For substantiation of Topic price of real estate portfolios, a clear scientific definition and the unambiguity of databases for the determination of the cost-based prices, market values and rental income of immotops within real estate portfolio is of utmost importance (see Table 2.2).

*Table 2.2 Decision matrix und parameters of immotop (S...Symbol)*

<b>Bidder</b>	<b>Investor</b>	<b>Parameter name</b>	<b>S</b>
The bottom line price	Target price	Cost value including land value!	<i>a</i>
Target price	The highest price possible	Income value including remaining useful life	<i>b</i>
Theoretical market price		Market value determined by valuer	<i>w</i>
Topic price		Total of property prices established by means of probability theory including their variances	$\mu, \sigma^2$

Source: Own design

The theoretical relevance of this thesis is based on the elaborations on probabilistic development of Topic price of real estate portfolio in the chapter 7. The particular relevance is described in chapter 3 through the development of a privatisation model for future asset privatisation of residential properties. This can – in adapted form – also be of relevance for portfolio owners in the selection of housing units suitable for tenant privatisation.<sup>76</sup>

For real estate portfolios, the capital markets are of prime relevance. When the privatisation of a real estate portfolio is planned, it is reasonable to implement it via a bidding process. This bidding process will represent the basis of the following explanations related to

### **Hypothesis 1:**

*Bidding processes of real estate portfolios the tendering the substantiated Topic price based on a balance of the conflicting interests of suppliers and investors proceed more favourable than biddings based minimum bids.<sup>77</sup>*

In the Topic price bidding process, the public authority owner (supplier) does not announce anymore a so-called minimum price for the bids (in a computer-aided bidding process), but a Topic price. The Topic price represents a sample price substantiated by means of probability theory within a negotiation scope deemed in the sense of an assumed statistical scope measured by standard deviations. There is no need to announce a minimum bid anymore.

<sup>76</sup> See. Gutbrod, C. P. 41

<sup>77</sup> From now on the public authority as owner will be called supplier.

In demand are bids, which also include the soft decision criteria (soft skills). These could comprise tenant protection (social charta), rent caps, refraining from luxury modernisations or terminations of leases. Capital investment expectations (future rental income), however, represent hard decision criteria. Hence follows:

## **Hypothesis 2:**

*In bidding processes using Topic price models second price biddings with hidden bids are redundant due to the introduction of statistical acceptance conditions for first biddings.*

Investors provide independently from each other bids in the *first bid* for the real estate portfolio. Only those bids are shortlisted that fall into the range of the statistical assumptions of the Topic price. In the decision process, the winner is the investor with the best bid.

The best bid is characterised by the best relation of the price on the one hand and social standards (social charta) on the other hand. For the investors, honest bidding behaviour represents the most reasonable strategy. It means the bidding processes based on Topic price models are more efficient on minimum bids. The Topic price models do not lead the investors to offer the highest prices with the lowest social standards for the purpose of inverse auctions. The shorten privatisation process of public authorities considerably.

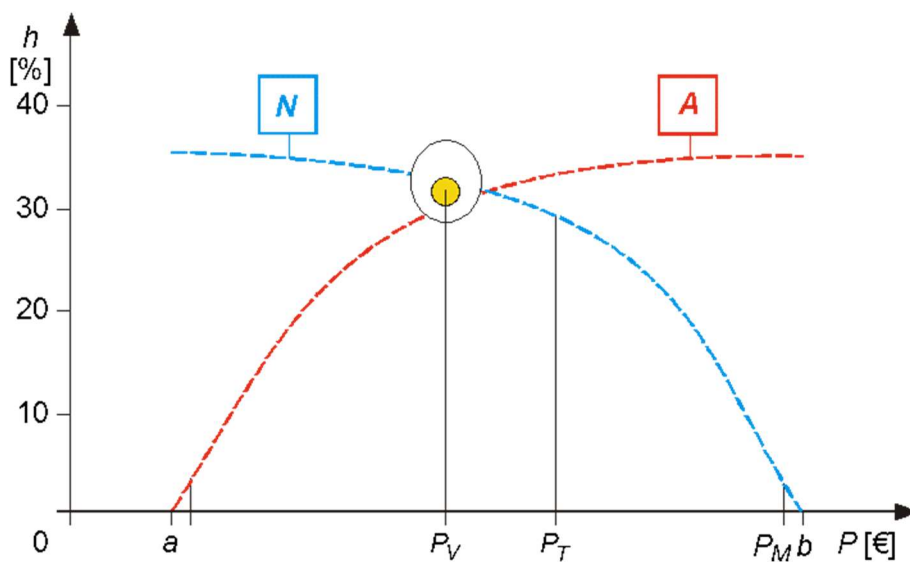
Topic prices represent a theoretically founded and simultaneously practice-related aggregation of property value components. They consider experience and social and business interests. They also comprise legal regulations and ordinances, conceivable investment plans and the strategic objectives of a company.

The figure on finding the „reasonable“ Topic price of a real estate portfolio and the immotops included (see Figure 2.1,  $A$ ...supply prices curve,  $N$ ... demand prices curve,  $P_K$ ...cost-based price,  $P_M$ ...rent-based price,  $P_T$ ...Topic price,  $P_V$ ... market value,  $a$ ...price start,  $b$ ...price end,  $h$ ...frequency,) leads to

## **Hypothesis 3:**

*The probabilistic distribution of property prices within real estate portfolios is based on the cost-based price, comparative value, Topic price and rent-based price. It represents with the most probable Topic price and its variance  $\sigma^2$  (standard deviation) the negotiation scope for the price of a real estate portfolio!*

Figure 2.1 Determination of the Topic price of an immotop



Depending on the economic cycle changes in supply and/or demand occur. Thus, the final Topic price for the portfolio represents a balance price. The interest of investors in buying increases with increased economic security in the respected capital market and the lower the price.

Supply and demand in property transactions follow market mechanisms. There is a close connection between prices for real estate portfolios, the property transaction market and the capital market in general. Considering various factors impacting real estate supply and demand, the Topic price or the probabilistically determined balance price represents the intersection of supply and demand prices and their close environment.

#### Hypothesis 4:

*Finding the optimal Topic price of a real estate portfolio requires the combination of business-substantiated price calculations with investment analyses of payment streams of supplier and investor resting on mathematical statistics.<sup>78</sup>*

The process is dynamic, since the payment streams within the useful lives of immotops may vary: these changes of investment factors during the remaining useful life will be calculated and their reasons disclosed. In the calculation of rent-based price the exit revenue is comprised.<sup>79</sup> The *payback period* of the acquisition costs of the investor based on the rental income (Topic price of immotops or of the real estate portfolio) will be determined by the cash outflows

<sup>78</sup> In order to be able to analyse the cost-effectiveness of an investment, the incoming and outgoing payments within a useful life will be analysed. From a time period perspective it is differentiated between the retrospective and prospective investment analyses. The retrospective analysis deals with the past and data were collected via experimental calculations, the prospective analysis is based on data collected via calculated analyses or on data estimates and they are used in decisions on the assessment of the cost-effectiveness of an investment.

<sup>79</sup> See Oppitz, V (2011/1) P. 56, 60

including operating cost and the cash inflows including depreciations. The binding period with cost-based prices and the corresponding payment streams i.e. the estimate of capital factors follows from the functions of capital flow.

### **Hypothesis 5:**

*The probabilistic distribution of prices of real estate portfolios is suitable to support the development of a European real estate and capital market, since it takes into account various EU ownership relations for buildings and land.<sup>80</sup>*

The probabilistic distribution of prices is a new method of property valuation considering capital market orientated treatment of land and its specific qualities and features. From a mathematical statistical point of view the decision criteria will be processed from all three strategy positions (supplier, investor and market situation). This interest mix is most suitable for consulting companies in the real estate industry in order to introduce a new perspective in this field. It represents a link of German standard valuation methods<sup>81</sup> with dynamic methods of investment appraisal for real estate portfolios regarding direct investment (see Table 2.3).

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<sup>80</sup> See „EU-Directive 2004 and 39 and EG on „markets for financial instruments“.

<sup>81</sup> German legal standard for the determination of market prices of land according to the regulations of ImmoWertV.

Table 2.3 Main components of calculation of Topic price (S...Symbol)

Parameter	S	Description
Rent-based price	$b$	Present value of prospective payment flows of immotops plus exit revenue of land value. The payment flows are due during the useful life. Their changes during the useful life will be calculated and the reasons disclosed. Binding period, useful life and payback period will be determined from the cash flows. <sup>82</sup>
Cost-based price	$a$	Acquisition cost minus transactional and tax related depreciations. If a real estate portfolio is sold with a positive gap between the Topic price and cost-based price, the so-called book profit arises, if a negative gap occurs, the depreciation has to be incurred in order to settle the balance sheet.
Market value	$w$	Monetary value of land or facilities related to it including land, <sup>83</sup> buildings, internal and external facilities, fixtures and fittings, the legally determined multiplier is to be applied to the annual gross operating income based on the market purchase price set out valuation experts for immotops of the same type in the same or similar locations with regard to qualities and characteristics with impact on price. For developed land, the price is to be determined in line with market prices of comparable pieces of land or with comparison factors, for building land it is determined in line with prices of comparable sites or with appropriate standard land values. Any material, local or regional deviations as well as other factors with a value impact are to be considered adequately.
Topic price	$\mu, \sigma^2$	The most probable monetary value of immotops or real estate portfolios with reference to fluctuation margins, binding period and payback period determined by the distribution of rent-based price, cost-based price and market value as well as from useful life of immotops.

Source: Own design. In accordance with the valuation rules (BauGB/WertV).

Hereafter it is necessary to substantiate and derive a probabilistic model for comprehensive analysis of direct investments in real estate by means of mathematical statistics. Here the standard methods of property valuation and dynamic investment appraisal are considered. However, German and Anglo-Saxon methods of real estate valuation determining market value differ as they are based on two different cultures.

## Hypothesis 6:

*By deriving model interactions from the original independent variable German and Anglo-Saxon real estate valuation methods can be combined in a comprehensive investment analysis model!*

The calculation of rent-based price, the yield and the market price of the investment asset and the probabilistic determination of the Topic price are the relevant research contributions. The valuation methods of real estate portfolio including immotops, determination of the cost-based

<sup>82</sup> The operating cost show a specific behaviour during the useful life, e.g. linear or exponential, what needs to be considered in the selection of the model. The values of annual depreciations and operating cost (not represented in isolation) are to be added in the individual years of use and calculated as a sum.

<sup>83</sup> *Land value*, square meter prices for the total space of real estate portfolio – regardless whether developed or undeveloped – related to comparable sites or standard land values provided by the valuation expert committees of the communities.



price and market value applied will be based on current application practice. The methods are closely related to the statistical investment appraisal.

The core hypotheses:

1. the probabilistic bidding process without a minimum bid,
2. the bidding process with Topic price models without the second bids,
3. the probabilistic determination of Topic price with standard deviation of a real estate portfolio

are to be investigated and proven as consistent within this thesis.

The new research aspects of this thesis lie in the fact, that probabilistic modelling expands the former selective deterministic price orientation of real estate sales. With the Due Diligence process the focus of the appraiser, besides the valuation of the real estate portfolio on the assessment of the suitability for privatisation of the housing stock (2<sup>nd</sup> order privatisation). It is of greatest importance to analyse the real potential of the housing stock of a real estate portfolio already purchase and disclose the essential opportunities of the sale. The investor with the best strategy is able to pay the highest price or to concede concessions regarding the social charta.

### **2.3 Theses on property privatisation / Privatisation-Analysis-Model**

The following theses are to be verified in this thesis and derived from the considerations stated above:

1. Land possesses an independent price influencing directly the investment appraisal of sites.

For determination of land value is not important whether the land is developed or undeveloped. Land value is independent from the building standing on it.

The land yield  $z$  also has a direct influence on the investment appraisal. It expresses the measure of the land yield.

Through the combination of the calculation rate  $p$  (expressing the prospect of capital market) and the land yield  $z$  a comprehensive investment appraisal of the land is possible. This is possible due to the special qualities of property as an economic good and the real estate market.

There is interdependency between land and environment reflected in the income revenue rate  $r_E$  (rate of return of real estate portfolio, ARR).

Model and simulation calculations move within the boundaries of valid data. These boundaries can be derived from reality.

2. The development of a privatisation analysis model (PAM) along with finding the Topic price for individual sales within the immotops should ensure that in valuation not only the market price (market value) for a purchase is determined, but also to control a part of the management transaction strategy of the particular investor.
3. The results database serves to investors to build up their investment models in order to pricing and decision-making in the purchase process of the real estate portfolio.

The provision of individual prices, sale ratios and sale periods<sup>84</sup> makes planning of future payment flows possible.

In addition, sale scenarios and prices provide for lenders an important basis for financing.

After successful acceptance of the bid a comparatively swift start of individual privatisations is possible. This supports the liquidity or can be a part of refinancing.

Depending on the framework conditions PAM can be adjusted to and applied for new housing privatisation.

PAM represents not only an analysis tool for bidding, but also serves for analysis of housing portfolios by their portfolio holder. Here it is possible to investigate comparatively fast and accurately which housing stock within the immotop is suitable for tenant privatisation.

For the areas Due Diligence, real estate valuation, real estate portfolio valuations and tenant privatisation new approaches arise: Valuations of real estate portfolios and immotops in great numbers within the tenant privatisation: interlinking of housing privatisation of residential real estates, Due Diligence, real estate valuation, valuation of real estate portfolios and immotops and tenant privatisation.

Practice-orientated approach elaborated in a scientific manner based on several case studies.

4. Based on the experience of author as project leader of Due Diligence processes (since the end of 1990ies) the following sub-questions and research questions are included in the thesis:

Is it possible to apply the PAM model that is to be developed in a valuation aiming at the sale of a property?

How should valuation teams of tenant privatisations involved in Due Diligence processes be designed regarding structure and processes?

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<sup>84</sup> Preliminary phase: sales scenario

How should the database be structured (operating and results database)?<sup>85</sup>

How does the valuation process of real estate portfolios (desktop valuations and drive by valuations) process during Due Diligence?

What are the criteria for successful tenant privatisation?

How does price differentiation work in tenant privatisation?

Which assumptions are taken into account in asset privatisation scenarios?

How is quality assurance of the results database and the Due Diligence report carried out?

5. Is it possible to develop a method in order to examine within Due Diligence processes the suitability of housing units for privatisation?

So far valuations of real estate portfolio generally focussed on the property value of individual houses (DCF method).

The price determination shall be extended to the element potential tenant privatisation of individual houses. The problem lies in the complexity of the individual field. This is reason why until now no standard model has been developed. This is the objective of this thesis.

6. The application of the PAM developed will enable valuations of real estate portfolios from the point of view of revenue maximisation

The results of analyses of real estate portfolio should provide support to investors in Topic price finding.

Application of the model enables the extrapolation of revenues to be achieved in the tenant privatisation. From the results of real estate portfolio analysis, a prospective real estate portfolio strategy can be derived.<sup>86</sup>

7. Within a bidding process PAM represents a timely and compared to individual valuations also a cost-efficient solution for the analysis of large housing stocks.

Here should be proven, that the model for real estate portfolio analyses can be applied to housing stocks of different sizes regardless whether 1,000, 10,000 or 100,000 housing units are to be analysed for privatisation suitability. In comparison to individual valuations considerable time and cost savings can be achieved, in particular regarding large housing stocks.

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<sup>85</sup> Database of operating data and results database: in order to process the acquired data database will be developed. It will contribute to the simplification of computing algorithms. The results will be transferred in a result database for the respective purchaser.

<sup>86</sup> See Lehner, C. P. 111 ff.

8. The connection of valuations of real estate portfolios and tenant privatisation enables to elaborate different prices for housing units according to different purchaser target groups.

The target group can consist of tenants, who wish to buy their flats, buyers who wish to acquire vacant commonhold flats or investors, who wish to acquire a rented flat. This was not conceivable in traditional valuations. The price differentiation became only possible through the implementation of tenant privatisation.

9. The application of the newly developed PAM methodology facilitates the valuation for the sales purposes considerably.

The application of PAM represents a model proven in practice that considerably simplifies valuation of very large real estate portfolios. Here in-depth knowledge on real estate valuation and tenant privatisation is required.

Each project works with a different database. Therefore, appropriate adjustments are required. This procedure enables valuations aiming at sale of housing stock.

10. Also holders of housing portfolios, who wish to examine their housing stock regarding their suitability for privatisation, can apply PAM.

Should this thesis prove valid, then PAM cannot only be applied within Due Diligence processes but also as a consulting tool for every housing company.

The focus is on real estate portfolio analyses from the point of view of possible tenant privatisation.

11. Tenant privatisation leads to higher revenues than the sale of immotops or real estate portfolios, when the sale price is exclusively orientated on the rent-based price.

It takes longer time to sell housing units in a building individually. However, higher revenue can be expected. This should be proven in the analysis of various results databases (50,000 to 140,000 flats).

Comparison of revenues of the two groups, test of hypotheses: comparison of two mean values. Comparison may involve:

Revenues per m<sup>2</sup> in tenant privatisation.

Revenues per m<sup>2</sup> in global sale of a building or Immotops.

12. The higher are the rents; the sooner flats are suitable for tenant privatisation.

- The rent level always reflects the market situation as well as the building condition of the flat. It is assumed that market rented flats represent better sales options within a

tenant privatisation. Variable 1: rent level, metric Variable 2: suitability for tenant privatisation.

- How is suitability measured? Within an existing result database is each building classified as suitable for tenant privatisation or unsuitable for tenant privatisation. In addition, privatisation priorities were allocated to each building (1 = very good and 5 = very bad).
- Which qualities and characteristics lead to the variable „suitability“? For each privatisation priority criteria were derived.
- In order to show the relationship rent level > suitability, the suitability must have a value. The value of suitability will be determined through the privatisation priorities.
- If the suitability is to be represented on a scale (e.g. not at all, rather bad, medium, good, very good), the rank order correlation could be applied.
- In the valuation of immotops scaling is used, in the mass valuation of housing units privatisation priorities are allocated on a scale from 5 to 9 (1, 2, 3, 4, 5 or 1, 1 ½, 2, 2 ½, 3, 3 ½, 4, 4 ½, 5).

13. The larger the housing units the sooner housing units are suitable for tenant privatisations.

- It is assumed that the effective demand for larger housing is higher than that for smaller housing units. Variable 1: size of flat, metric. Variable 2: suitability for tenant privatisation

14. Only 25 % to 50 % of the housing units within an immotop are suitable for tenant privatisation in larger companies.

Whether a housing unit is suitable for tenant privatisation depends on its location (micro location and macro location), the building structure and the occupiers. The author will prove, that only a certain proportion of buildings is suitable for division.

Variable proportions of suitable housing units. How will be the qualities and characteristics

- location (micro location)
- location (macro location)
- building structure
- occupiers

- suitability for tenant privatisation yes or no as well as 5 privatisation priorities (1 to 3 = suitability for tenant privatisation given and 4 to 5 suitability for tenant privatisation not given).

15. Whether a housing unit is suitable for tenant privatisation depends on the location (micro location and macro location), building structure and occupiers, whereas only a certain proportion of the buildings are suitable for division.<sup>87</sup> Where

$L = Y(P - C) - YDF$  represents

- L : locally achievable and payable rents for use (in €/km<sup>2</sup>)
- Y : harvest yield (in t/km<sup>2</sup>)
- P : market price of field crop (in €/t)
- C : production costs of field crop (in €/t)
- D : distance to market (in km)
- F : transport cost rate (in €/t/km)

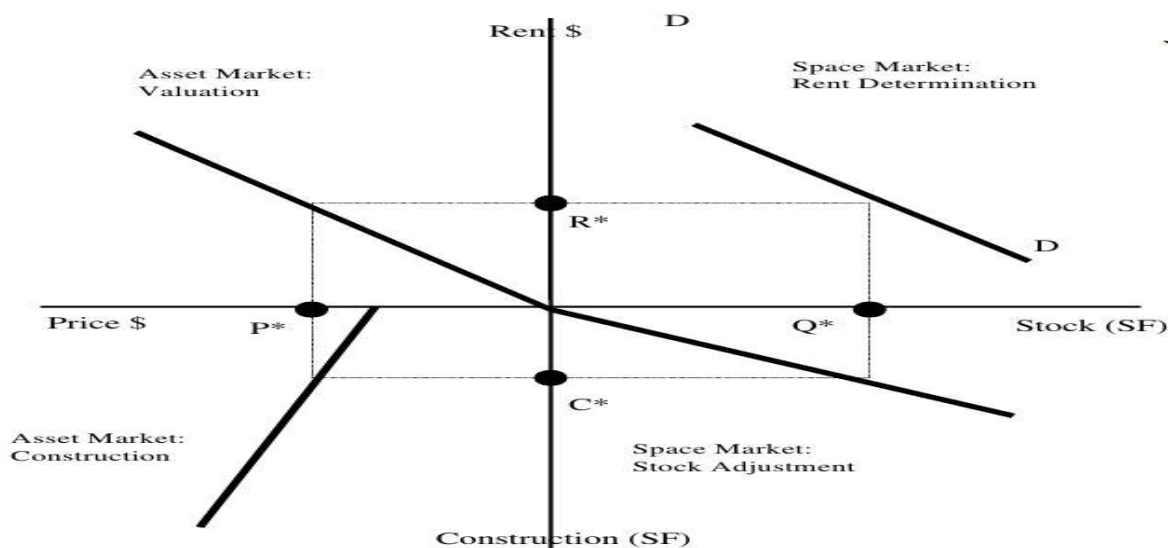
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<sup>87</sup> Learning about value drivers and simplified procedures in the valuation of large housings stock in an immotop, confirmation of the land value theorie by Johann Heinrich von Thünen. Source: [https://en.wikipedia.org/wiki/Johann\\_Heinrich\\_von\\_Th%C3%BCnen](https://en.wikipedia.org/wiki/Johann_Heinrich_von_Th%C3%BCnen)

## 2.4 Excursion: Market for Housing - 4-Quadrant Diagram

The last-mentioned theory is based on Johann Heinrich von Thünen (1793 to 1950). In the meantime there are, of course, more modern approaches such as William Alonso (1933 bis 1999) on the contemporary bid rent theory. The theories “Model of four quadrants” developed by DiPasquale and Wheaton were further developed (Geltner/Miller/Clayton/Eichholtz) and gives a good actual overview. The model combine the asset market (valuation and construction) and the space market (stock adjustment and rent determination). See Figure 2.2. Munro and Smith research over the Microstructures of Housing Markets.<sup>88</sup>

Figure 2.2 Model of four quadrants by DiPasquale/Wheaton



Source: DiPasquale/Wheaton, P. 149 ff.<sup>89, 90</sup>

<sup>88</sup> See Smith, S. J./Munro, M. P. 1ff.

<sup>89</sup> <http://image.slidesharecdn.com/wk1-101211064514-phpapp02/95/wk1-7-728.jpg?cb=1292049948>

<sup>90</sup> See DiPasquale, D./Wheaton, W.C. P. 149 ff.

## 3 Development Privatisation-Analysis-Model

### 3.1 State of the desk and field research

The desk research represents an important foundation for the:

- justification of research objectives,
- systematic justification of theses and algorithmic prove,
- formulation of hypotheses regarding pricing methodology and validation of the model.

This applies to the theoretical foundations and the modelling base on them, the research with regards to property-related determinations, the experiences gathered and the application of selected data in connection with mathematic-statistical calculations.<sup>91</sup>

For the analyses of the methods Due Diligence and valuation of real estate portfolios a structure is used in order to categorise privatisation priorities.

In the real estate literature, a statistical approach to privatisation of property is described. Even though numerous statements can be found, that pricing is of the utmost importance for a successful real estate transaction strategy, the examination of literature shows a significant lack of a systematic concept regarding a methodology related to market-conform pricing based on the use value. Starting points can be found in the German Wertermittlungsrichtlinien (valuation guidelines) and American DCF method.<sup>92</sup> The reason for this lay especially in the fact, that prosperities have only recently become attractive as investments. The opportunities and risks<sup>93</sup> of transactions of immotops are manifold: heterogeneous locations, differing aging structures of properties, very different building conditions, etc.

High yield expectations and competitive pressure force investors to increase profitability and reduce costs. Thus new business fields are developed, income-enhancing modernisations are carried out and work processes are improved. Sales procedures are structured in order to achieve higher results. Due Diligence experts from various filed are involved in the transaction process. In the course of large transactions almost all fields of the real estate industry are involved (see Figure 3.1).<sup>94</sup>

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<sup>91</sup> This concerns only transactions in Germany with a lot size of more than 50,000 housing units including the following areas relevant for real estate portfolios: Due Diligence, property valuation and privatisation (see chapter 1.3). The evaluation is conducted on the privatisation analysis on the six large real estate portfolio described. Thus objectives, theses, and hypotheses can be demonstrated.

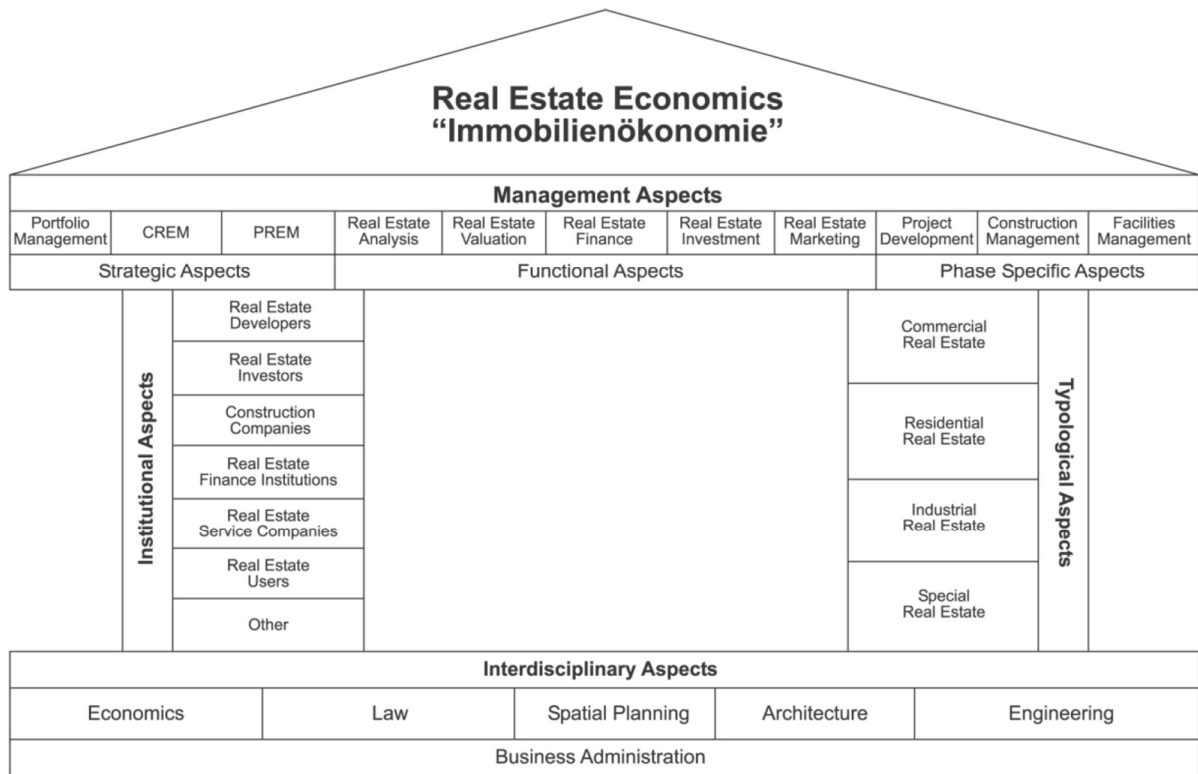
<sup>92</sup> See Schultheiß, T. P. 120 ff.

<sup>93</sup> See Brühl, M. P. 193 ff. On Due Diligence and structuring of transactions from the buyer's point of view.

<sup>94</sup> See Schulte, K. (2003) P. 110



Figure 3.1., House of Real Estate Economics“



Source: Schulte, K. (2003) P. 110

The Due Diligence-team Tenant Privatisation (Buyer's Due Diligence) alone consists of ten to thirty real estate professionals, valuers and tenant privatisation experts. Such large teams require a structured project organisation. The seller data are to be verified, complement and aggregate in order to arrive at the correct assumptions<sup>95</sup> and standardise the transaction process for the market players. Due to the fact that the housing stock of real estate portfolios is distributed over various locations, a good overview of the individual real estate markets is required.<sup>96</sup>

The direction in which bidding and transaction procedures are further developed, is determined by a new mathematic-statistical model based on common Central European valuation methods. They represent a combination of so-called standardised and international valuation methods.

For the pricing model, different processing phases<sup>97</sup> (see Table 3.1) will be used: income, sales comparison, and cost approaches.<sup>98</sup>

<sup>95</sup> See Windorfer, Ch. P. 309 ff.

<sup>96</sup> This happens inter alia by consulting market reports, interviewing of local brokers and banks, evaluating data of the committee of valuation experts, and through the analysis of relevant portals of real estate agencies. Desktop and drive-by valuations are conducted in parallel. See Plötz (Real estate guide)

<sup>97</sup> Referring to the reference literature. See Brühl, M. P. 196.

<sup>98</sup> Arndt, J.-K. P. 69 ff.

Table 3.1 Evaluation of an ideal real estate portfolio transaction

Phase 1		Phase 2		Phase 3	
4 weeks	Confidentiality agreement, deadline indicative bid	4 weeks	Binding bid und Letter of Intent (LOI)	Max. 3 1/2 months	Closing
Preparation phase		Bidding		Closing of the transaction	
Low examination depth		High examination depth		Consideration of the (finale) results of the technical and legal Due Diligence	
Limited liability		High number of individual valuations		Forwarding of valuation to financing partners	
High number of desktop valuations (possibly only); no (low number of) inspections		Inspection			
Low documentation scope (executive summary style)		Comprehensive documentation of valuation design and of the results in a valuation report			

Source: Own design / REAL ESTATE STUTTGART

Firstly, each real estate market represents a macro-environment, and secondly, each immotop is situated in a micro location and is as a rule not movable (see Table 3.2.).<sup>99,100,101</sup>

*Table 3.2 Special features of real estate markets*

<b>Markets in general (goods markets)</b>	<b>Real estate markets</b>
Functioning of market assumes mobility of supply	Functioning of market does not depend on transparency of supply and mobility of demand.
Mobility leads to a competitive supply. Demand-driven competition is nearly irrelevant.	Competition of supply is lower, the smaller the scope for location decisions. Considerable demand-driven competition in buoyant markets.
Goods markets are represented at various locations with concentrated supply.	Demand responds to supply at various locations. The supplier searches the buyer. Supply changes permanently within locations.
The supplier determines a price at which a certain amount can be sold.	Prices are determined (except for development projects) by respective buyers' meetings, best the conditions required.
Legal framework for binding purchase is simple.	Complex legal preconditions (legal costs, high transaction costs).
Prompt adjustments of supply to the changes in demand.	Supply responds with a large time lag to the changes in demand. Thus, strong price responses may occur.

Source: See Murfeld, E. P. 46 ff.

For property types, such as office, retail, or special-purpose properties there is not "one" real estate market, but specific markets e.g. construction,<sup>102</sup> occupier<sup>103</sup> or residential real estate market. However not only existing stock play a role, but also property developments. Essential market factors are the economic situation, employment, legal framework, tax regulations, housing subsidies and interest rates.<sup>104</sup> The theory of microeconomics is based on a perfect market with total competition in which supply and demand determine the price. When the demand curve intersects, the supply curve meets at the price-quantity equilibrium, market equilibrium develops (see Table 3.3).<sup>105</sup> How buyers respond to price changes depends on the price elasticity of a good or on the cross-elasticity of other goods.<sup>106</sup>

<sup>99</sup> Exception: shifting the Imperial room („Kaisersaal“) of the former Hotel Esplanade to Potsdamer Platz in Berlin.

<sup>100</sup> Referring to the reference sources. See Sailer, P. 120 f.

<sup>101</sup> See Murfeld, E. P. 46 ff.

<sup>102</sup> Market for investment properties and owner-occupied homes

<sup>103</sup> Market of tenanted housing, commercial occupier market.

<sup>104</sup> As in this thesis multi-family houses but also single-family houses, terraced houses and semi-detached houses. See Sailer, E. P. 120, 123

<sup>105</sup> See Krugman, P./Wells, R. P. 62 ff.

<sup>106</sup> See Sailer, E. P. 143 ff.

*Table 3.3 Overview of supply and demand model*

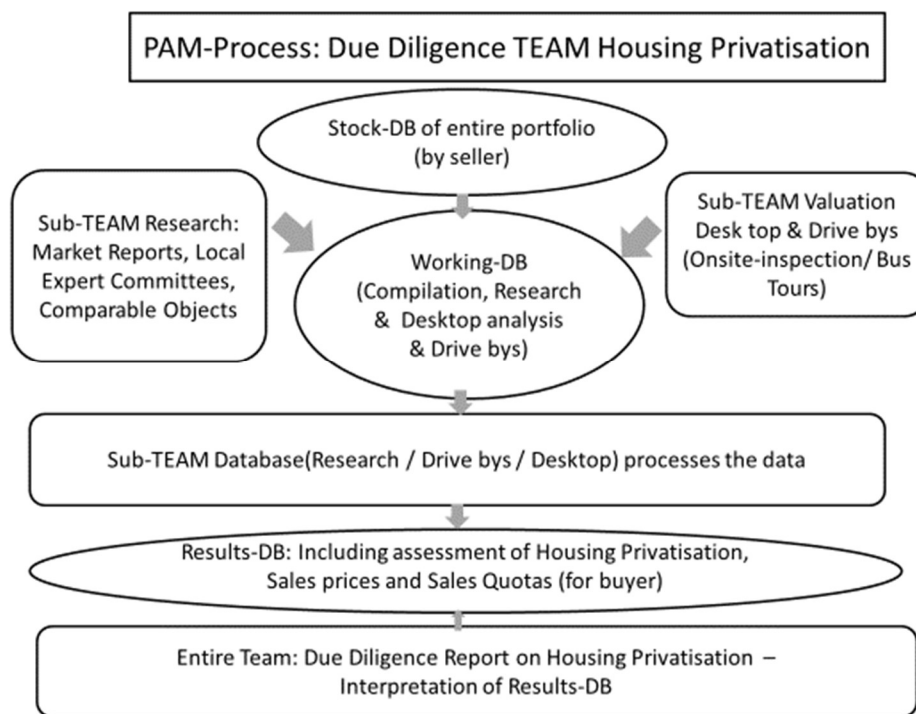
The supply and demand model is a model of a competitive market – a market one in which there are many buyers and sellers of the same good or service.	The supply schedule shows how the quantity supplied depends on the price. The relationship between the two is illustrated by the supply curve.
The demand schedule shows how the quantity demanded changes as the price changes. This relationship is illustrated by a demand curve.	Supply curves are normally upward sloping; at a higher price, producers are willing to supply more of a good or service.
The law of demand asserts that demand curves normally slope downward – that is, a higher price reduces the quantity demanded.	A change in price results in a movement along the supply curve and a change in the quantity supplied.
Increases or decreases in demand correspond to shifts of the demand curve. An increase in demand is a rightward shift: the quantity demanded rises for any given price. A decrease in demand is a leftward shift: the quantity demanded falls for any given price. A change in price results in a movement along the demand curve – a change in the quantity demanded.	As with demand, increases in supply correspond to shifts of the supply curve. An increase in supply is a rightward shift: the quantity supplied rises for any given price. A decrease in supply is a leftward shift: the quantity supplied falls for any given price.
The five main factors that can shift the demand curve are changes in (1) the price of a related good, such as a substitute or a complement, (2) income, (3) tastes, (4) expectations, and (5) the number of consumers.	The five main factors that can shift the supply curve are changes in (1) input prices, (prices of related goods or services, (3) technology, (4) expectations, and (5) number of producers.
The market demand curve is the horizontal sum of the individual demand curves of all consumers in the market.	The market supply curve is the horizontal sum of the individual supply curves of all producers in the market.

Source: See Krugman, P./Wells, R. P. 62 ff.

In the analysis of real estate market, it can be distinguished between a monopoly (one market participant), polypoly (many market participants) and oligopoly (several market participants). Whether a monopolistic supplier is able to make use of its market power depends on the substitutability of goods. Furthermore, pricing methods in tenant privatisation will be discussed and the results evaluated with the statistical methods (see Figure 3.2).

Subsequently, the practice-related procedure will be analysed which leads to the results database.

Figure 3.2 Methodology / Process Due Diligence Team Housing Privatisation



Source: Own design / REAL ESTATE STUTTGART

In the individual valuation of immotops, or comprehensive valuation of the real estate portfolio there is always interplay between resources allocation, opportunities and risk affinity. Time-consuming and costly individual valuations are not considered. However, the danger of superficial („quick and dirty,“) valuations may not be underestimated.<sup>107</sup>

Regular valuations are reasonable from a business point of view, and are also legally regulated within financial reporting in Germany. Here it must be distinguished between land value und building value. In Anglo-Saxon countries, often different owners of land and building can be found. Here it is distinguished between leasehold and freehold. Leasehold corresponds to the German hereditary building rights.<sup>108, 109, 110, 111</sup>

In the Czech Republic, there is not legally distinguished between building and land.<sup>112</sup> From an investment point of view this means that the capital bound in land perpetual annuity is applied regardless of type and duration of the commercial use of the property.

<sup>107</sup> See Brühl, M. P. 199 ff.

<sup>108</sup> See Section 94 BGB. The land ownership is a prerequisite for establishing adequate construction prerequisites, usually of buildings that enable their use.

<sup>109</sup> See „Handbuch Immobilienrecht in Europa“, 2004

<sup>110</sup> Generally, the hereditary building rights are effective from 75 to 99 years. So the building is not bound to the land as long as hereditary building rights are in effect. Only after the payment of linear capitalized value of potential yield of the building the owner of land becomes also the building owner.

<sup>111</sup> Anglo-Saxon „Leasehold“

<sup>112</sup> Reference over the German –Czech Chamber of Industry and Commerce. <http://tschechien.ahk.de>

It is important for the investor to structure and create the economic use in such a way, that the investor achieves high financial results. The ground rent substitutes the annual rent for the capital bound in the land. From the point of view of an investment the property yield<sup>113</sup> represents the price reference for the time availability of land and the annual rent the compensation corresponding to investments with fixed interest rate.

Regarding transaction concepts of immotops the hypothesis is valid; that land of an immotop is permanently economically usable, even if there are not buildings on it and the land is alternatively.<sup>114</sup> Generally the ground rent of an immotop and the return from its economic exploitation are two sides of cash flows following from yield of a property: from the time availability of land<sup>115</sup> and from the capitalisation of investments in the economic exploitation of the immotop.

### **3.2 Elements Privatisation-Analysis-Model**

In Germany in many cases valuations are conducted by publically appointed and sworn-in experts appointed by the Industrie- und Handelskammern (German Commercial and Industrial Chamber, (IHK)). They are obliged to comply with Immobilienwertermittlungsverordnung (German Federal Ordinance for Valuation (ImmoWertV)).<sup>116,117</sup> They take part in legal disputes arising in court the course of distribution of estates or divorces or give their expert opinion in valuation expert committees. Any deviations from the regulations stated in the ImmoWertV are to be justified in official valuation report. Publically appointed and sworn-in experts only conduct valuations and are not involved in any way in the sale, purchase or letting of the properties they are instructed to value in order to keep their independence.<sup>118</sup> Real estate funds and bank generally instruct valuers with RICS or Hypzert-qualifications.

Whether housing stocks qualifies for tenant privatisation depends on a variety of factors. Here the factory occupancy, property type and the relevant real estate market will be investigated early on. The legal bases for these conversions are the regulations defined in the Wohnungseigentumsgesetz (Commonhold Act). Thus, it is necessary to differentiate between technical and

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<sup>113</sup> For the use of land being a scarce good, since land and building create one unit in Germany.

<sup>114</sup> Land constitutes also an investment protection, due to the fact that it cannot be extended at will. Therefore thorough planning is prerequisite in order to assess the investment decision appropriately including sound knowledge of the possible purchase price, prospective management costs and the comparatively low ground rent is of crucial importance besides future capital growth of the investment.

<sup>115</sup> As a rule a proportion of the land value is determined at the beginning of the term of the leasehold.

<sup>116</sup> This „Ordinance about the principals for the determination of the open market values of real estate“ includes the recognised principals for the determination of the open market values of real estate and rights equivalent to real property.

<sup>117</sup> Other experts are free.

<sup>118</sup> Since German publicly appointed experts does not participate in the market, there may be a risk of lack of information and a propensity to a „lonely fighter attitude“. See Schulte, K. (2008) P. 61

preliminary sales planning. These processes run partially in parallel.<sup>119</sup> Generally large real estate transactions are conducted as competitive bidding procedures. The seller usually instructs at least one sale consultant (often from investment banking or accounting) who manages of the bidding process. Serious investors receive a memorandum on sale of the real estate portfolio, if they committed themselves to the transaction by submitting a first indicative bid. Investors from the larger investment circle, however, only receive a teaser with aggregated data.<sup>120</sup>

Investors on the short list receive further data e.g. on locations, age of the properties and building conditions. Here the portfolio data bank will be made available. Important data is available on management units, buildings or even flats. Besides property data (see Table 3.4)<sup>121</sup> often also photos of the individual properties can be accessed.<sup>122</sup>

Table 3.4 Portfolio Database

Type	Portfolio Database	Operating Database	Results Database
Occupier	Is provided to the prospective purchaser by the seller		
Level	<b>Flats, Immotope, Cluster</b>		
Criteria	Serial no./Property no. City Street House number Number of flats Living space Rent Building type Year of construction Vacancy Etc.		

Source: Own design / REAL ESTATE STUTTGART  
 Based on the data from the databanks described above, operating databanks are developed<sup>123</sup>  
 (see Table 3.5, Table 3.6).

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<sup>119</sup> See Stürzer, R. P. 42 ff.  
<sup>120</sup> See Pfirsching, F. P. 193  
<sup>121</sup> Conversion process: Evaluation of the data on housing stock and research data in order to develop a results data bank.  
<sup>122</sup> E.G. MS-Excel, -Access. See Reis, J. P. 45 ff.  
<sup>123</sup> It contains among others the following data: number, address, property type, units (e.g. number of floors, use (commercial or residential), vacancy, underground parking), fit-out and property data (e.g. balconies, floor area, rent, number of rooms), overview of flats including with location analysis and data on the assessment of tenant privatisation, if available. The more detailed the databases, the better is the analysis.

Table 3.5 Privatisation analysis of an Immotop – Example Bonn

Investment and privatisation analysis <u>Immotop Bonn</u>		Priorities				Classification Expert	weighting	Sum	
		very good 1	good 2	satisfactory 3	criterion for exclusion 4 / 5				
1.1.	<b>Location</b>								
	Conurbations and middle-order centres in: Bavaria, Baden-Württemberg, Hesse, Rhineland Palatinate, Nord Rhine Westphalia, Lower Saxony, Hamburg, Bremen, Saarland, Schleswig-Holstein, Berlin	Conurbation	Middle-order centre	Regions	Fringes	2	3	6	
1.2.	<b>Micro location</b>								
	Sought-after location, normal to good residential area	Sought-after location	Good	Normal	Simple	2	2	4	
2.0	<b>Year of construction</b>								
	Range	1970-1980	1960-1970	1950 - 59 / from 81	Before 1950 / after 1990	3	1	3	
2.1.	<b>Type of housing units</b>								
	100 – 500 housing units, smaller units close to each other, larger units as partner of a property company. Mainly residential use	100 - 200	200 - 500	50 - 100	Below 50	1	3	3	
2.2.	<b>Share of commercial use</b>								
	< 10 %	0%	10%	15%	over 15 %	1	1	1	
2.3.	<b>Type of flat [GV2]</b>								
	1-, 2- and 3- bedroom flats, share of 1-bedroom flats < 30 %.	Mostly => 2 bedrooms	Mostly => 1 bedroom	Mixed	> 30 % = studio	1,5	3	4,5	
2.4.	<b>Flat sizes</b>								
	Suitable for families and demand / average 70 % optimal	70 - 80 m2	65 - 69 m2	60 - 64 m2	Under 59 m2	1	3	3	
3.	<b>Demand</b>								
	No en-suite rooms / (central) heating / balcony / bathroom / general building condition and fit-out	High demand	Average demand	Normal demand	Demand on by special target groups	2	2	4	
4.1.	<b>Tenant structure - general</b>								
	Housing units with established tenant structure, no socially troubled area	Established / good	Good	Average	Socially troubled area	2	2	4	
4.2.	<b>Tenant structure - pensioners</b>								
	Pensioners and tenant age above 60 years < 25 %,	0%	Up to 15 %	Up to 25 %	> 25 %	3	2	6	
4.3.	<b>Tenant structure - social benefits</b>								
	Number of tenants receiving social benefits < 10	0%	Up to 5 %	Up to 10 %	> 10 %	3	2	6	
4.4.	<b>Tenant structure - fluctuation</b>								
	Annual fluctuation < 10 %.	2%	5%	Up to 10 %	> 10 %	2	1	2	
4.5.	<b>Vacancy rate</b>								
	< 10 %	0 - 2 %	3 - 4 %	Up to 10 %	> 10 %	1	1	1	
5.1.	<b>Rent / legal restrictions / subsidies</b>								
	Privately financed / social charta / occupancy / leasehold	Privately financed	Social charta expires	Social charta (10%)	Social charta + leasehold	1	1	1	
5.2.	<b>Rent / assessment of current rent level</b>								
	Market rent	Underrented	Market rent	Stagnation	Overrented	1	1	1	
5.3.	<b>Rent / rent increase</b>								
	Increase	20 % increase	Up to 10 % increase	Within the range of the rent index	(cost rent)	1	2	2	
5.4.	<b>Operating costs / assessment of current operating costs</b>								
	Keyword: Explosion operating cost / supplements for lifts	Up to 1 €/m2	Up to 1.5 €/m2	Up to 2 €/m2	Non-recoverable	2	1	2	
6.1.	<b>Purchase price factor</b>								
	10- times 14-fache of the annual net rent	Up to 10 x	Up to 11 x	Up to 14 x	Up to 14 x	3	3	9	
6.2.	<b>Sales price factor (investor)</b>								
	After rent increase / yield expectations of investor / high regional variations	> 8 %	> 7 %	> 6 %	Below 6 %	3	1	3	
6.3.	<b>Additional burden rental purchase</b>								
	Premises: additional burden in the case of 15 % equity / interest rate 6 % / repayment 1 %, home owner subsidy: yes, children: no	Up to 0 €	Up to 50 €	Up to 100 €	> 100 €	2	2	4	
7.	<b>Refurbishment / modernisation</b>								
	Partially possible, technical Due Diligence required, only estimates	Up to 100 €/m2	Up to 200 €/m2	Up to 300 €/m2	> 300 €/m2	2	2	4	
8.	<b>Sales ratio / demand</b>								
	Sales ratio rental purchase	Up to 70 %	Up to 50 %	Up to 30 %	Below 30 %	2	1	2	
	Demand empty flats	Very high	High	Normal	No demand	3	1	3	
	Demand investment	Very high	High	Normal	No demand	3	1	3	
9.	<b>General assessment of expert</b>								
		BUY !!! Bid	BUY! Lower price!	Buy under certain conditions	Hands off!	1	3	3	
<b>Note: Criteria and weighting can be modified. The ideal property will have a factor of around 2.0 (factor 1=ideal in all respects). K.o.-criteria always critical.</b>						<b>Weighting</b>	<b>48,5</b>	<b>45</b>	<b>84,5</b>
						<b>K.o.-criteria</b>	<b>0</b>	<b>Factor</b>	<b>1,88</b>

Source: Own design / REAL ESTATE STUTTGART



Table 3.6 Investment appraisal Immotop - Example Fassberg

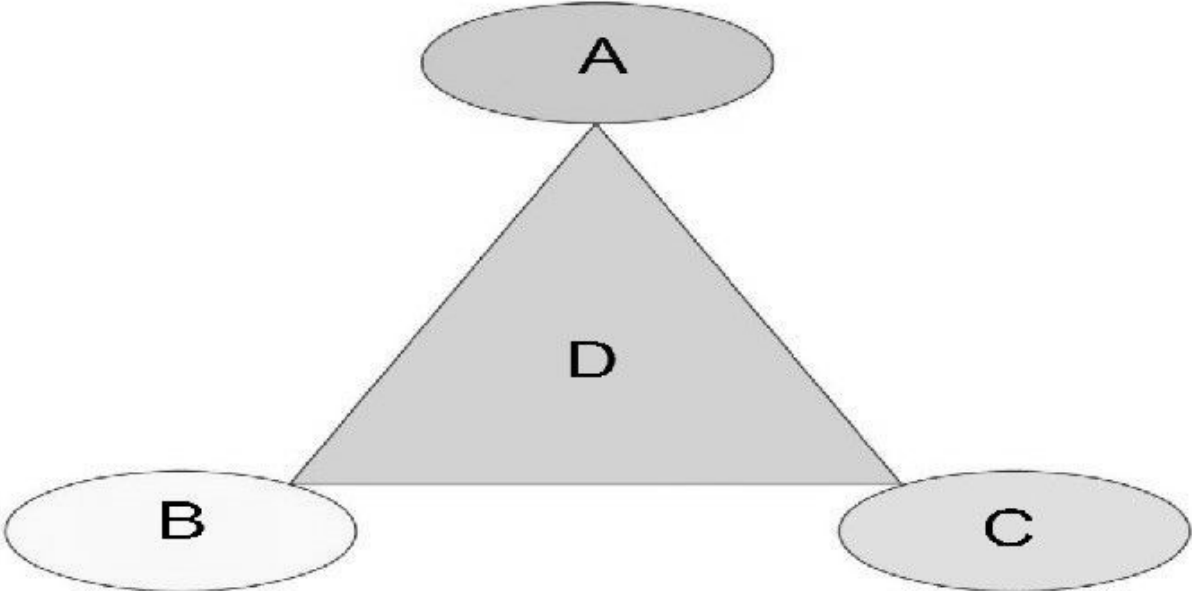
Property	29328 Fassberg, Lower Saxony Finkenweg, Jägerweg, Im Wildgarten		Seller Agent Vacancy	Excellent Real Estate 10%	
Year of construction	1958 - 1961		Bid from:	1.9.	
Subsidies	Yes, public subsidies, already expired		Option:	1	
Property data	Housing units	284 Units	Information from sales details		
	Commercial units	0 Units	2	Floors	
	Total units	284 Units	71	Buildings	
	Living area	19257 m <sup>2</sup>	67,81	m2 on average	
	Commercial area	0 m <sup>2</sup>		m2 on average	
	Total living / commercial area		19.257	m <sup>2</sup>	
	Underground parking spaces		-	Spaces	
	On-site parking spaces		100	Spaces	
	Garages		150	Spaces	
	Total parking space/garages		250	Spaces	
Rent	Net rental income p.a. residential	4,20 EUR/m <sup>2</sup>	971.455	EUR	
	Total net rental income p.a.	4,20 EUR/m <sup>2</sup>	971.455	EUR	
Multiplier	Gross yield / x-times of annual rent	9,3%	10,8		
	Net yield* / x-times of annual rent	8,4%	11,9		
	Net net yield* / x-times of annual rent	6,3%	15,9		
Costs	Purchase price	544 EUR/m <sup>2</sup>	10.481.484	EUR	
	Agent's fee	3,57%	374.189	EUR	
	Property transfer tax (before 3,5%)	5,00%	524.074	EUR	
	Legal costs	2,00%	209.630	EUR	
	Acquisition costs	602 EUR/m <sup>2</sup>	11.589.376	EUR	
	Modernisation	200 EUR/m <sup>2</sup>	3.851.400	EUR	
	Social	15 EUR/m <sup>2</sup>	288.855	EUR	
	Upfront u. ancillary marketing costs	1.300 EUR/Unit	369.200	EUR	
	Total costs	836 EUR/m <sup>2</sup>	16.098.831	EUR	
	Return on Sales	Sales housing unit	1.000 EUR/m <sup>2</sup>	19.257.000	EUR
Sales commercial unit		1.000 EUR/m <sup>2</sup>	-	EUR	
Sales underground parking spaces		7.500 EUR/Unit	-	EUR	
Sales on-site parking spaces		1.500 EUR/Unit	150.000	EUR	
Sales garages		5.000 EUR/Unit	750.000	EUR	
Total (without sales commission)			20.157.000	EUR	
Sales committee	Sales committee	7,00%	1.410.990	EUR	
	Net total	973 EUR/m <sup>2</sup>	18.746.010	EUR	
	Total costs	836 EUR/m <sup>2</sup>	16.098.831	EUR	
	Total coverage	137 EUR/m <sup>2</sup>	2.647.179	EUR	
Break-even	Break-even		85,9%	Prozent	
	Inspection (suitability for privatisation)	Rejected:	No	By:	RR
		Follow-up:	Yes		RR
		Technical inspection	No		Information requested
		Price or asking price:	no		BZ
	Price or asking price:		no	10,8	10.481.484 EUR
	Notes:				
	Net yield: purchasing price plus acquisition costs. Net yield: as above / rent - 25 % operating costs High vacancy rate (10 %), layouts of flats still up-to.date? Market in Faßberg? Maintenance backlog? Sales success depends strongly on rent level and building condition. Note by expert: follow-up planned, further information requested from agent.				

Source: Own design / REAL ESTATE STUTTGART

On the basis of databanks and interviews with real estate agents analyses of regional and international markets, purchasing power and demographics were executed (see Figure 3.3).

A: Market analysis, B: Property analyses, C: Analysis of demographics and D: Privatisation analysis).

Figure 3.3 Market Analysis



Source: Own design / REAL ESTATE STUTTGART

The analysis comprises location reports, unemployment rates in the relevant areas, market reports, ancillary costs, reports and documents by valuation expert committees<sup>124</sup> including opinions of local experts and obtaining of „second opinions“. Properties given priorities regarding their suitability for privatisation and assumptions are made regarding the disposal procedure (see Table 3.7 and Table 3.8).

Table 3.7 Sale success rates within 5-year period

Priority	Tenant purchase	Vacant flats purchases	Investor purchases	Sale after 5 years	Remainder
1	35%	35%	30%	<b>100%</b>	0%
2	30%	30%	30%	<b>90%</b>	10%
3	25%	30%	25%	<b>80%</b>	20%

Source: Own design / REAL ESTATE STUTTGART

<sup>124</sup> Such as standard land values, rent indexes and market prices of sales.

Table 3.8 Sale Scenario

<b>Sales Scenario / Sales period 5 years / Example with 100 flats</b>							
Project Excellent		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	
Flats at sales start	100	100	69	48	33	24	<b>15</b>
Tenant purchases	25%	100%	0%	0%	0%	0%	<b>100%</b>
Flats	25	25					<b>25</b>
Vacancy flat purchases	30%	20%	40%	20%	10%	10%	<b>100%</b>
Flats	30	6	12	6	3	3	<b>30</b>
Investors purchases	30%	0	30%	30%	20%	20%	<b>100%</b>
Flats	30	0	9	9	6	6	<b>30</b>
Sales	<b>85%</b>	<b>31</b>	<b>21</b>	<b>15</b>	<b>9</b>	<b>9</b>	<b>85</b>
Remainder after 5 Years	<b>15%</b>	<b>69</b>	<b>48</b>	<b>33</b>	<b>24</b>	<b>15</b>	<b>15</b>

Source: Own design / REAL ESTATE STUTTGART

Desktop valuations of the property stock are often combined with Drive-by inspections.<sup>125</sup> However, also official inspection comprising interviews with tenants<sup>126</sup> are already possible during the purchasing phase. During the inspection first marketing strategies are conceived.

In practice, the following privatisation priorities was developed. They are not static, thought, and must be adapted to each property stock respectively:

1. Priority: immotops highly suitable for tenant privatisation, such as single-family houses, terraced houses, attractive locations, sought-after layouts, extremely high-quality specification, tenant gardens.
2. Priority: immotops with 2 to 3 full storeys, low density, green areas, attractive housing estate, good location, sought-after and family friendly layouts, high quality specification, balconies and loggias available, tenant gardens.
3. Priority: out-dated buildings with acceptable layouts and flat sizes, medium quality specification, balconies available or retro-fittable.
4. Priority: immotops unsuitable for tenant privatisation, such as unattractive high-rise housing with some socially troubled quality, tertiary locations, low rents, low quality specification; some features may present K. o.-criteria.<sup>127</sup>

<sup>125</sup> Age structure, level of social benefits, household sizes, quality of covenant, income, equity, employer, tenat record.

<sup>126</sup> Fit-out and finishes (hallway, internet access, flower decorations, curtains), ancillary rooms with project-related data acquisition, general impression, suitability for privatisation, layout, surroundings, building condition, maintenance level, lease agreements, self-disclosure.

<sup>127</sup> Such as too low purchasing power level, high unemployment rate, demographic growth, immotops in rural regions, number of floors, and percentage of the extremely small units within the housing unit.

5. Priority: K. o.- criteria depend on a particular investment strategy. Examples are low purchasing power, high level of social benefits and unemployment rate, leasehold, negative population growth and low rent level, rural location, high rise structures or certain building types e.g. prefab buildings, high share of commercial use, high share of the extremely small flats within the housing unit (studios and 1-bedroom flats).

Besides legal and social requirements the conversion rates in tenant privatisation depend on various parameters: sale process, marketing, number of flats, capital market and real estate market, monetary policy, fluctuation, relocation logistics, situation and location, ownership rate, etc.

Pricing plays a particularly important role here (see Table 3.9). Here nearly always the following question arises: “Is there any „optimal“ price for both the market and the tenant purchasing the flat?” (see Table 3.10)

*Table 3.9 Methodology Calculation of privatisation sales prices (2<sup>nd</sup> order privatisation)*

<b>Price Components</b>	<b>Crucial Influencing Factor</b>	<b>Price Relation</b>
<b>Tenant price A</b>	"Additional financial burden of the tenant) (relation of rent level and mortgage) Commitment to property, building condition, potential profit in the case of resale, market	100%
<b>Investor price K</b>	Focus on yield (note: right of first refusal). Personal preferences (e.g. proximity to property). Expectations: rental growth, price movements, letting risk, return from alternative investments.	100% - 105%
<b>Price for vacant flat I</b>	Prices for vacant flats are related to market prices on the residential real estate market Transactions of comparable properties. Munich: prices often significantly higher.	110% - 120 %

Source: Own design / REAL ESTATE STUTTGART

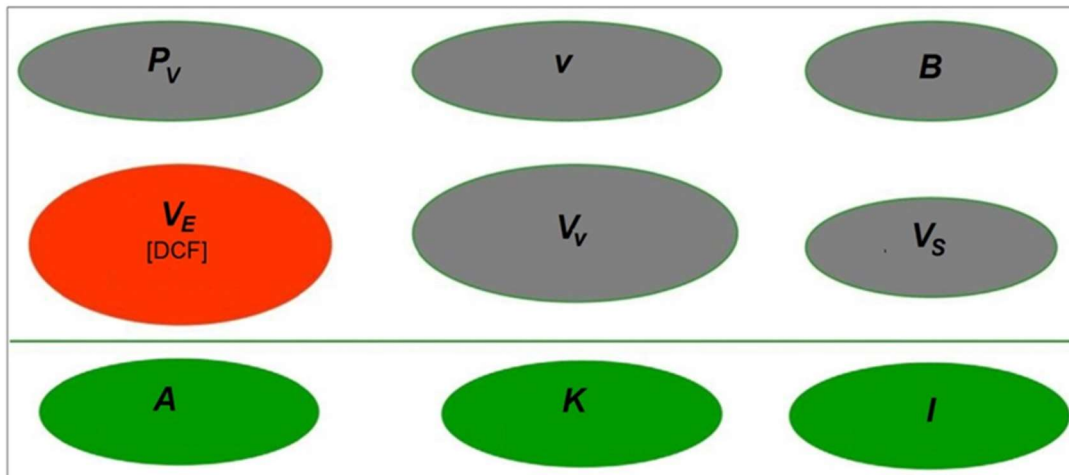
*Table 3.10 Methodology Calculation of privatisation sales prices II (2<sup>nd</sup> order privatisation)*

<b>Bottom-up</b>	<b>Top-down</b>
<b>"Additional financial burden for tenant"</b> From the tenant price A to the investor price K to the price for vacant flat I.	<b>"Market perspective"</b> Price for vacant flat I is derived from comparable transactions. Tenant price A and investor price K are calculated with a discount.

Source: Own design / REAL ESTATE STUTTGART

Parallel to determining the use value of a flat,<sup>128</sup> it is necessary to determine various pricings: What is the monetary value of a flat? See Figure 3.4:  $P_V$ ... market value,  $v$ ... multiplier,<sup>129</sup>  $B$ ... book value,  $V_E$ ... income value,  $V_V$ ... comparison value<sup>130</sup> and  $V_S$ ... depreciated replacement cost,  $A$ ... tenant price,<sup>131</sup>  $K$ ... investor price,  $I$ ... price for vacant flat.

Figure 3.4 Structure of price creation



Source: Own design / REAL ESTATE STUTTGART

The mutual dependence of prices requires in practice the following:

- Clarification of the demand at the location and on-site (see Table 3.11),
- a well-structured approach

from the perspective of the target group of tenants:

- pricing through the „calculation of additional financial burden for the tenant“ – relation of rent to debt after acquisition,
- based on the calculation of the financial tenant burden the purchase price should not exceed the rent € 0 to 100 as a maximum,
- comparable properties from other housing privatisations at the location,
- differentiation by cities (purchasing power) and immotop and rent structure,

<sup>128</sup> The *use value of a property* consists of the suitability for a specific use by demander/occupier. The measure is the personal perception and individual assessment of these natural persons, how far the various qualities of the property meet the desired requirements regarding the use. See Oppitz, 2000

<sup>129</sup> „As a capitalisation factor the *multiplier* is calculated. It is a result of remaining useful life and yield.“ Oppitz, V (1995) P. 126

<sup>130</sup> Price for vacant flat is derived from comparable transactions. Tenant price A and investor price K are calculated with a discount (Market perspective – Top down).

<sup>131</sup> From the tenant price to the investor price to the price for vacant flat (Additional financial burden for tenant – Bottom-up).

Table 3.11 Digital data from the Due diligence databases

Type	Portfolio Databank	Operating Databank	Results Databank
Occupier	Provided by seller to prospective buyer.	Consultants of prospective buyer process the data.	
Level	<b>Flat, Immotop, Cluster</b>		
Criteria	Property No. Town/city Street/s Street number/s No. of flats Flat size/s Rents Building type Year of Construction Vacancy Etc.	Purchasing power indicators Unemployment rate Location analyses Comparable rent Comparative price Comparable properties Standard rent index Desktop valuation Drive-By valuation Evaluation of photos Etc.	

Source: Own design / REAL ESTATE STUTTGART

from the perspective of the target group of investors:

- Wohn-Riester (subsidised pension scheme by the German government to support home ownership at retirement) 2008? → insofar hardly any impact!
- energy certificate 1.7.2008? → contrary to expectations and also little impact → however, since 2013/2014 increased mentioning of energy values in advertisements
- financial crisis 2009/2010? → brought about in the following years a real estate boom in Germany → however, in some regions boom of depreciated replacement cost and low interest rates!

from the perspective of the target group of buyers of vacant flats:

- pricing: different yield expectations in specific sub-markets,
- expectations regarding future sale prices,
- letting risk, vacancy level at location,
- current rent, latest rent increase, standard rent index, rent increase potential,
- price limit: tenant price based on right of first refusal by the tenant in the course of the conversion of housing,

- in sales of remaining stock or the sale of several commonhold flats to one investor the tenant price is often not reached in practice (threat: tenant accepts the purchase price due to „rumours on lower prices“),
- comparable prices at the location,
- differentiation by cities (purchasing power), immotop and *rent structure*.

The relevant influencing factors are: annuity, equity, rent, ancillary costs, current or future non-recoverable operating costs. The more suitable the location, the building type and demographics, the better are the chances for property privatisation → high conversion rate and stronger asset privatisation based on reliable data on the housing stock<sup>132</sup> including good macro and micro locations, plus high rents, large flats and a socially balanced tenant structure (see Table 3.12).

Table 3.12 Evaluation portfolio and research data

Type	Portfolio Database	Operating Database	Results Database
Occupier	Provided by seller to prospective buyer.	Consultants of prospective buyer process the data.	Results are summarised here. The prospective buyer develops his financial model based on this data.
Level	<b>Flats, Immotops, Cluster</b>		
Criteria	Property No. Town/city Street/s Street number/s No. of flats Flat size/s Rents Building type Year of Construction Vacancy Etc.	Purchasing power indicators Unemployment rate Location analyses Comparable rent Comparative price Comparable properties Standard rent index Desktop valuation Drive-By valuation Evaluation of photos Etc.	Multiplier for global sales Tenant privatisation yes / no Privatisation priority 1-5 Tenant price A per m <sup>2</sup> Investor price K per m <sup>2</sup> Price for vacant flat I per m <sup>2</sup> Sales ratio per target group Sales period per target group Etc.

Source: Own design / REAL ESTATE STUTTGART

### 3.3 PAM-Report and Bidding procedure

Conducting Due diligence processes usually take several weeks or months. The results are presented to the investor in the form of a due diligence report focusing on tenant privatisation. For further details see PAM report „Project Excellent 2017“ in the appendix. Due to confidentiality requirements, the data needed to be anonymised. The privatisation analysis model represents to a lesser extend a model in the scientific sense. The components or modules presented lead

<sup>132</sup> Conversion process – evaluation of portfolio and research data, in order to build up the results database.

through the due diligence process. The sum of all assessments and evaluations results in the PAM report including the results data bank.

In practice, in addition to the hard facts, a number of soft factors are included in the final pricing for the bidding process (see. Table 3.13).

*Table 3.13 Bidding procedure – hard and soft facts*

Considerations of the bid in the bidding process	Facts
1. Result of Due Diligence	hard
2. Funding opportunities	hard
3. future strategy	hard
4. strategic bonuses	hard
5. Fear of failure / bad cost	soft
6. Expectations about behaviour with bidders / Seller	soft
7. Other considerations ("Why not"-Strategy)	soft

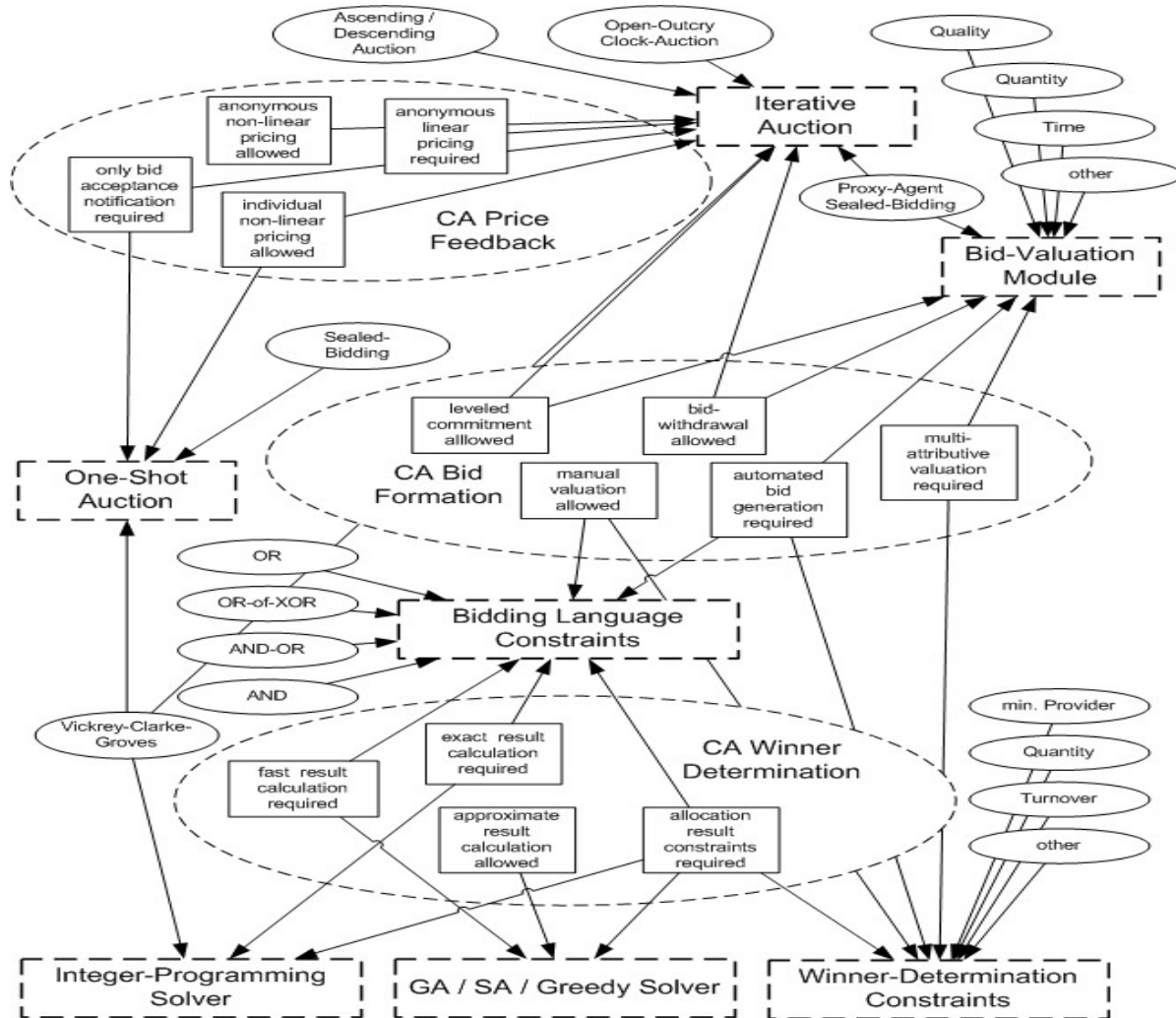
Source: Own design / REAL ESTATE STUTTGART

These figures from the PAM report support bidders in bidding processes. But is the winner of a bid not the first loser? Did the bidder not pay too much for the portfolio? This topic is discussed in the literature under the heading „winner's curse“.

A number of bidding procedures have been developed in practice. Some are multi-level; in some only one bid is possible. The following figure shows the decision-making design of combined bidding processes depending on the system qualities and features required (see Figure 3.5). Depending on the sales period also here adjustments are made.



Figure 3.5 Design decisions for the design of combined auctions



Source: Combinatorial Auctions ([ca.wiwi.uni-frankfurt.de/download/Tutorial.htm](http://ca.wiwi.uni-frankfurt.de/download/Tutorial.htm))

Within a bidding process the winner of a bid needs to ensure, that he did not pay too much in total. Regarding the winner's curse, it is discussed, whether the winner of a bid is at the end not the (only) loser. Did he pay too much? The question can only be answered in retrospect (see Table 3.14). The winner of the auction saw a goodwill in the assessment of the company. And no badwill.<sup>133</sup>

Table 3.14 Bidding procedure – Winner's Curse

Bidding procedure			
Comparison		Highest bid	Difference = Winner's Curse
Market Value	5,600,000,000 €	7,000,000,000 €	-1,400,000,000 €
Bid of second bidder	6,000,000,000 €	7,000,000,000 €	-1,000,000,000 €

Source: Own design

In the following the methodology and the process flow of the privatisation analysis model are presented in a practice-related context.

<sup>133</sup> See Wikipedia: "Goodwill in accounting is an intangible asset that arises when a buyer acquires an existing business. Goodwill represents assets that are not separately identifiable. Goodwill does not include identifiable assets that are capable of being separated or divided from the entity and sold, transferred, licensed, rented, or exchanged, either individually or together with a related contract, identifiable asset, or liability regardless of whether the entity intends to do so. Goodwill also does not include contractual or other legal rights regardless of whether those are transferable or separable from the entity or other rights and obligations. Examples of identifiable assets that are not goodwill include a company's brand name, customer relationships, artistic intangible assets, and any patents or proprietary technology. The goodwill amounts to the excess of the "purchase consideration" ([https://en.wikipedia.org/wiki/Goodwill\\_\(accounting\)](https://en.wikipedia.org/wiki/Goodwill_(accounting)))

### 3.4 Methodology Privatisation-Analysis-Model

Table 3.15 Methodology and Workflow PAM while Due Diligence

Nr.	Workflow	Database	Methodology
1.	project start		consultation with client, which data is required in which time.
2.	organization Due Diligence Team privatization		Underteams for drive-by, research, desktop, databases and report
3.	sighting teaser / sales memorandum		first analysis of the stock. plausibility calculations
4.	Sighting portfolio database	Portfolio Database	check whether data matches Sales Memorandum
5.	definition tools from privatization analysis model		schedule planning, schedule division, scheduling, planning center stage
6.	adaptation portfolio Databank	Portfolio Database	existing portfolio database is, if necessary, cleansed to expand columns for research data. Columns for rental and price calculations.
7.	definition in clusters or immotopes	Portfolio Database	database must be adapted in such a way that there is a working level. Clusters can be: administrative units, immotopes, individual houses, apartments, m <sup>2</sup>
8.	definition of the approach Desktop-Valuation	Operating Database	installation of the "black box" - all research data, rental data, price data on the immotop or cluster level.
9.	Definition of the approach Drive-by-Valuation	Operating Database	design assessment sheets, route planning, scheduling. Definition of digital capture.
10.	execution Drive-by-Bewertungen		training of employees. Plausibility check.
11.	optional sightseeing apartments / call tenants		frequently in this phase not at all or only conditionally possible.
12.	execution Desktop-Valuation	Operating Database	combination of standardized and international procedures. Weighting.
13.	execution Expertengespräche, Makler		experts' talks are held to better assess the value and position of the company. Z. .B. Landlords, brokers, banks etc. "Second opinion"
14.	evalute Reports Market Reports, Data Review Committee		expert data reflect the property market from the past. Market reports are usually tied to future-oriented, but often also interests.
15.	evalute Valuation in Database	Operating Databank	filling the "black box" with all relevant data. Subsequently weighting.
16.	Q&A-Session seller		question-answer round at the seller. Previous strategy. Future Strategy Review.
17.	procurement research data per city / location		evaluation Real Estate portals, Real Estate guide Plötz, Compare databases
18.	research comparison objects		own compare databases, Research at brokers Real Estate portals
19.	research comparison rents		evaluation of rent levels regional, nationwide
20.	execution income value	Operating Database	based on actual rent, market rent, and rent on new lease.
21.	execution comparison value	Operating Database	relative to comparison transactions, comparison database
22.	Interpretation and weighting assessment calculations	Operating Database	tendency higher approach of sustainable rents. Weighted combination of several procedures possible.
23.	definition of privatisation priorities	Operating Database	establishment of the 5 (10) privatization priorities. 1 = very good; 5 = no privatization possible.
24.	definition of sales quotas	Operating Database	depending on the size of the immotope, the location, the pricing, etc.
25.	definition of selling times	Operating Database	depending on the size of the immotope, the location, the pricing, etc.
26.	calculation Multiplier (selling whole house)	Operating Database	multiplier more oriented to the value of the market, less at the tenant price
27.	calculation tenant price per m <sup>2</sup>	Operating Database	Bottom up or Top-Down
28.	calculation price for vacant flat per m <sup>2</sup>	Operating Database	Bottom up or Top-Down
29.	calculation Investor price per m <sup>2</sup>	Operating Database	Bottom up or Top-Down
30.	determination of privatisation priorities	Results Database	standstard privatization priorities are adjusted to the portfolio.
31.	determination privatisation yes/no	Results Database	privatization priorities: 1 - 3 = yes / 4 - 5 = no. Possibly. Definition of KO criteria.
32.	determination Abverkaufsquoten	Results Database	combination of privatization priority and size of the immotope.
33.	determination Abverkaufszeiträume	Results Database	combination of privatization priority and size of the immotope.
34.	determination Market Rent	Results Database	evaluation of rent levels regional
35.	determination Miete bei Neuvermietung	Results Database	evaluation rentals for residential providers, internet portals, markup on market rent.
36.	determination all prices and Creation Report Privatization Analysis Model		summary of all results. See Appendix "PAM-Report"
37.	determination Results Database final	Results Database	summary of all relevant results in DB for clients.
38.	review session – price meeting		defense of the results before the client. Possibly. Even before another team.
39.	review session - with another Due Diligence Teams		recognition of new findings.
40.	project completion or start next project phase	Results Database	adjustment of final report and results database.

Source: Own design / REAL ESTATE STUTTGART

## 4 Concluding Remark

In this paper best practice observations in the fields housing and residential properties, housing privatisation, real estate valuations, mass valuations, Due Diligence processes and extensive practical project experience were discussed.

By analysing the valuation method (theory) and based on the privatisation-analysis model, a pricing model was developed. Both will support investors in optimal pricing.

From a scientific point of view, the privatisation analysis model represents more a process, supporting Due Diligence teams in practice to successfully conduct mass valuations of large housing stocks.

The underlying stochastic model of real estate portfolios transactions is based on the calculation of price indications for immotops with the beta distribution. Here it is applied for probabilistic-theoretical modelling based on determined prices.

The author was extremely luckily as he was actively involved in almost all large housing transactions in Germany within the last 20 years, whether within the context of the buying process (bidding process) or in the subsequent implementation of sales measures. This involved either the sale of individual immotops as a whole or classic tenant privatisation.

Very few real estate professionals in Germany display this special expertise in the field Due Diligence processes of tenant privatisations and have a proven track record in these large transactions. In the next step, though, it is important to deepen this knowledge and to transfer it other countries.

Future prospects: The next application of the privatisation analysis model could result in the project "Wealth for all!". There are many municipal residential companies in Germany. In the same way as in the case of the „old debt assistance Act“ („Altschuldenhilfegesetz“) after reunification of Germany, these housing societies should get the following to their task:

Step 1: Sell 15% of flats from the dwelling stock to the tenant!

Step 2: Applying the PAM can be examined, which houses suited best for this tenant privatisation.

Step 3: The PAM allows pricing, which will enable many tenants, to buy their own apartment. Compared to the new housing development dwelling stock flats are essentially cheaper.

Step 4: Tenants start with the accumulation of assets. A first step in the direction of "Wealth for all!"

Politicians must be convinced of the "Wealth for all!" model. If successful, further stocks should be selected for tenant privatisation. And may be the model can be transferred to other European countries.

# Glossar

## Valuation - Overview - International Approach – Czech - Germany

Value determination	Process approach	Standardization	Czech	Value determination (german)	Process approach / remarks (german)
land value		WertV	hodnota pozemků	Bodenwert	Vergleichswertverfahren
comparison value	comparative approach	WertV	komparativní přístup	Vergleichswert	Vergleichswertverfahren
cost approach	depreciated replacement cost method	WertV	odepisován reprodukčních nákladů metodu	Sachwert	Sachwertverfahren
income value	income approach	WertV	výnosový přístup	Ertragswert	Ertragswertverfahren
market value	valuation approach	§ 194 BauGB	Tržní hodnota	Verkehrswert (Marktwert)	Verkehrswertverfahren
mortgage lending value		BelWertV	Hypotekární hodnota	Beleihungswert	analog mit Abschlägen
multiplier		Broker formula		Vervielfältiger	vereinfachtes Ertragswertverfahren
book value, fair value	accounting	IFRS, IVSC, HBG		Buchwert	Zeitwert
tenant price	Bottom-up / Top-Down	Privatisation of the 2nd order		Mieterpreis	"Mietermehrbelastungsrechnung"
investor price	Bottom-up / Top-Down	Privatisation of the 2nd order		Kapitalanlegerpreis	Renditeorientierung
vacancy price	Bottom-up / Top-Down	Privatisation of the 2nd order		Leerwohnungspreis	Vergleichstransaktionen
Topic price		The Topic designates the professional and mental ability of market participants to get involved in a polemic exchange of interests in the privatisation of real estate portfolios and their market-oriented		Topikpreis	Topikpreis - Summe der wahrscheinlichkeitstheoretisch ermittelten Grundstückspreise mit deren Varianz
Cost-based price $P_K$		The lowest price at which are assumed the favourable sale conditions, since there is no demand competition; only 1 per cent of all repetitions of immotop		Kostenpreis	Sachwert einschließlich Bodenwert! Unterste Preisgrenze Anbieter / Zielpreis
Rent-based price $P_M$		The highest price that can be achieved under the worst supply conditions and extraordinarily high frequency of inquiries		Mietenpreis	Ertragswert in der Restnutzungsdauer - Zielpreis Anbieter / Oberste Preisgrenze Investor
Fair market value	(here: Fair Value not like accounting, like adjusted Market Value)	Medium price that can be achieved under normal market conditions and it comprises all monetary values of immotop		Verkehrswert (adjusted)	Verkehrswert des Sachverständigen - Theoretischer Marktpreis

# Index

## List of abbreviations

AfA	tax depreciation
AfaA	Deduction for extraordinary technical
AfS	Deduction for reduction of substance
ARR	Average Rate of Return
AWG	Foreign Trade Law
BauGB	Town and Country Planning Code
Bau-NVO	German ordinance for land use
BEV	Federal Railway Property Fund
BfA	Federal Labour Office
BGB	German Civil Code
BRD	Federal Republic of Germany
BVR	Federal Association of German Cooperative Banks
DB	Database
DCF	Discounted Cash-Flow
DIFA	Open German Real Estate Fonds
DM	Deutsche Mark
e.g.	for example
etc.	et cetera
EU	European Union
Fig	Figure
GAGFAH	Gemeinnützige Aktien-Gesellschaft für Angestellten-Heimstätten (housing Company)
GBW	Gemeinnützige Bayerische Wohnungsgesellschaft (Housing Company)
GSW	Gemeinnützigen Siedlungs- und Wohnungsgesellschaft (Housing Company)
HGB	German commercial code
IDW	Minister of Finance of the Federal Republic of Germany
IHK	German Commercial and Industrial Chamber
ImmoWertV	Determination of German market value
ISBN	International Standard Book Number
ISSN	International Standard Serial Number
IT	Information technology
KAG	Investment Companies
KWG	According to the Act on Credit Institutions
LBBW	Landesbank Baden-Württemberg (Federal State Bank)
LEG	Development Companies of the German Federal States
M&A	Mergers & Acquisitions
MMM	Market-Movement-Matrix
No.	Number
NRW	Nordrhein-Westphalen
P.	Page
PAM	Privatisation Analysis Model
PfandBG	Act on Mortgage Bonds

Q&A	Question and Answer
Qu	Quarter
RAG	Ruhrkohle AG (Industrial concern)
REIT	Real Estate Investment Trust
RICS	The Royal Institution of Chartered Surveyors
ROI	Return of Invest
Südwow	Süddeutsche Wohnen (Housing Company)
TGA	building services
THS	Treuhandstelle für Bergmannswohnstätten (Housing Company)
VEBA	Vereinigte Elektrizitäts- und Bergwerks AG (Industrial concern)
VIAG	Vereinigte Industrieunternehmungen AG (Industrial concern)
WEG	Condominium Act
WertR	Regulation of German market value
Woba	Wohnungsbaugesellschaft (Housing Company)

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# Annex PAM-Report Project Excellent 2017

## Project Excellent 2017

### PAM-Report

Important Note: Data anonymized and changed.

#### Portfolio Analysis with Privatisation Analysis Model

- 1) PROJECT TEAM
- 2) OBJECTIVE
- 3) DATABASE / CLUSTERING
- 4) SELECTION
- 5) RESULTS OF THE STUDY
- 6) SUMMARY

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#### 1) PROJECT TEAM

Within the scope of REAL ESTATE DUE DILIGENCE, our company specializes in the field of privatisation capability of residential real estate (housing privatisation). Within the scope of acquisition verification of housing companies and/or their housing inventories in the Federal Republic of Germany, in recent years our employees were represented as consultants during all major transactions. We therefore have recourse to experienced experts in the housing privatisation segment.

Project team Excellent

R.R., FRICS, MBA	project management and control / desk top / report
B.Z., Engineer	
U.S., Real estate agent	privatisation spot check / comparable properties
U.R., Engineer	
B.Z., Engineer	
T.B., MBA	research / database / comparable properties
M.B., MBA	
R.S., Assistant	
R.T., IT	
T.E., Communications	

## 2) OBJECTIVE

In December 2016, REAL ESTATE STUTTGART was commissioned to perform the first audit of the inventories of the Excellent portfolio (phase 1). The objective of the first phase was to collect and analyze the drive-by values, and subsequently to evaluate the remaining inventory as well by means of extrapolation.

Therefore, the following activities were performed in phase 1:

1. Database evaluation
2. Organizing and implementing the "bus tour" on January 7, 2017, in Stuttgart (approx. 1,000 residential units)
3. Outside viewing of approx. ■ apartments = 20% of the overall inventory, in ■ cities
4. First evaluation of the privatisation capability, housing privatisation, exit strategy
5. First market and site analysis and comparative property research
6. Recording the results in "results database" according to the submitted template
7. Extrapolation/transferring the findings of the drive-by results to the total inventory, desk-top

## 3) DATABASE / CLUSTERING

The submitted database has an inventory of ■ residential units, status at . Based on the 2017 sales of approx ■ residential units, the current overall inventory is correspondingly lower. Data on parking spaces and parking garages were not clearly defined in the database. Likewise, there was no additional information on the type of public backing and/or replacing public funds for building leases.

In analyzing the submitted database, with the existing inventory we discovered that sometimes numbers had been assigned according to new residential units (arrivals of new houses/occupancies) for management units (MU) and not always for connected residential units. This produced a relatively high number of management units. Consequently, we checked the database city-by-city and formed connecting clusters.

For the first phase, we started out by inspecting approx. ■% of the inventory. ■ management units (arrivals of new houses/occupancies) were selected from ■ cities, and the management units were subdivided into ■ clusters. When selecting cities, top centers, medium centers, and small communities were considered.

The clusters within the cities were formed according to streets of houses, connected management unit numbers, years of construction, backing situation, size criteria of the house and/or average floor area. Apart from the first ■ clusters, regions were combined and site factors taken as a rough basis. These must be verified during the second phase.

Thus [REDACTED] apartments were filtered out for the first phase. This corresponds to a quota of approx. 21.1%.

Summary Phase 1	
[REDACTED]	Management unit
[REDACTED]	Cluster from management units
[REDACTED]	Residential units Apartments Phase 1
[REDACTED]	Residential units Apartments Total
[REDACTED]	Spot check Phase 1
[REDACTED]	Cities

After the viewings, detailed interviews were conducted, and the results were verified by means of market and comparative data. The results were documented and stored in the appropriate results database (refer to: Model Input RES MASTER 2017-01-18.xls). As a result of these findings, the first extrapolation (desktop) was performed based on the data entry form being made available by the client.

The following areas are provided in the results database.

<b>Rent</b>	<b>Sales General</b>	<b>Sales Prices</b>
<b>Sales Timing</b>	<b>Sales Success Rates</b>	<b>Parking spaces</b>

Furthermore, initial housing industry-related economic and statistical market data were analyzed, and comparables were compiled. During the second phase, the activities will be intensified.

When determining the inventories, we started out from a distribution of [REDACTED] residential units, as shown in the following table.

General overview All DUs by Large Cities	# of DUs	% of Total	Domestic Living Area m <sup>2</sup>	Annual Rent	Av. Rent	Av. Year of Construction	Av. Vacancy Rate	Av. DUs per House
				from DUs	€			
					€/month			
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

TOTAL



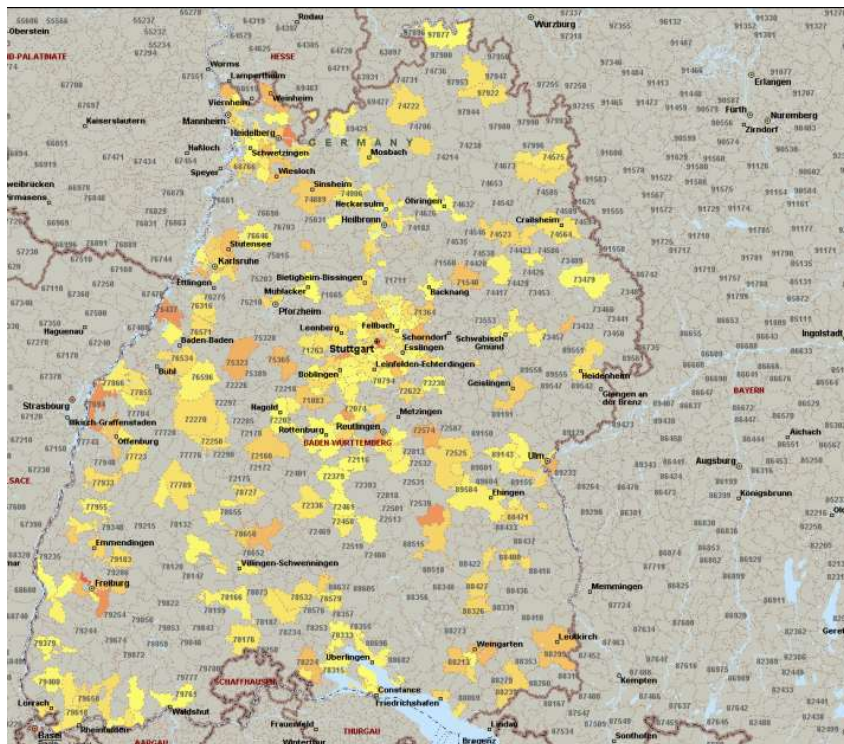
As the company was founded in Baden-Württemberg, most of the residential real estate inventories, as expected, are located in that part of Germany. Other inventories are located in the German capital [redacted] and in the state capitals [redacted].

### Baden-Württemberg



Apart from Bavaria, Baden-Württemberg is economically the strongest federal state in Germany. Its economic data rank is the highest in the country, its population has increased due to an influx of immigration in recent years, and its jobless rate is the lowest throughout the country.

The largest inventory is in Stuttgart, Baden-Württemberg's capital. The predominant part of the inventories is located at approx. [redacted] sites in Baden-Württemberg.



Baden-Württemberg

#### 4) SELECTION

During the first phase, properties were analyzed at the [redacted] sites [redacted].

The following table indicates in which [redacted] cities the first [redacted] clusters of the phase are located and where the clusters in terms of size are located within individual cities. All the sites in Berlin, Munich and Wiesbaden were visited.

No	All DUs by Large Cities	Total	phase 1	phase 1	Total	phase 1	phase 1	Total	phase 1
		# of DUs	# of DUs	in %	Living Area m <sup>2</sup>	Living Area m <sup>2</sup>	Living Area per DU	Annual Rent from DUs €	from annual rent from DUs €
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
4	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
7	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
9	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
11	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1213 14 15	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Color legend: - yellow: Total inventory - blue: Cluster 1- [redacted] (Phase 1)



**Part Two**

		Total	Phase 1
No	All DUs by	Av. Rent Residential Residential	Av. Rent Residential Residential
	Large Cities	€/month	€/month
1	██████	██	██
2	██████	██	██
3	██████	██	██
4	██████████	██	██
5	██████████	██	██
6	██████████	██	██
7	██████████	██	██
8	██████	██	██
9	██████████	██	██
10	██	██	██
11	██████████	██	██
12	████████████████████		
13	██████████████████		
14			
15			
	██████████████████	██	
	██████████	██	██

### 5) RESULTS OF THE EXAMINATION

The results database (clusters 1-█ + desktop) was submitted on 1/18/2017; the first meeting took place on 1/19/2017.

In the following, the figures were evaluated and summarized.

		Number Residential Units	Number Residential Units	Tenant Sales Price	Occupied Investor Price	Vacant Possession Price
		absolute	in %	in €/m <sup>2</sup> m <sup>2</sup> -weighted (unweighted)	in €/m <sup>2</sup> m <sup>2</sup> -weighted (unweighted)	in €/m <sup>2</sup> m <sup>2</sup> -weighted (unweighted)
Cluster 1-█	Privatisation	█	█	█	█	█
	No	█	█	█	█	█
	Cumulative	█	█	█	█	█
Cluster █-█	Privatisation	█	█	█	█	█
	No	█	█	█	█	█
	Cumulative	█	█	█	█	█
Total	Privatisation	█	█	█	█	█
	No	█	█	█	█	█
	Cumulative	█	█	█	█	█

In evaluating the visited units (clusters 1-█), an overall privatisation capacity (█) was determined relatively frequently. This contains residential facilities that already had started individual privatisation. Compared with other large portfolios, this offers a very good privatisation potential.

In accordance with our mandate, the houses were viewed from the outside. This time we were unable to access the apartments, examine the ground plans, and meet with tenants, caretakers or management. Nor was it possible to study the backing regulations and the potential of replacing the backing with public funds.

We were considerably more conservative with respect to those clusters we did not visit (privatisation quota: █%). Decisive factors not only were the findings from the drive-bys, but also factors such as rent levels, sizes of the apartments, locations, existing backing, and other statistical and demographic data. These will be used more intensively during the second phase. When examining these inventories in greater depth, we will no doubt discover a further hidden privatisation potential. The overall privatisation quota of █% thus is capable of increasing.

Compared with other portfolios, we consider the average tenant sales price of € █ within the first cluster 1-█ to be higher than average. In part, this was caused by new construction projects in recent years and facilities in high-priced markets, such as Munich, Stuttgart and Wiesbaden. Overall, southern Germany is leading economically. However, as a result of the textile industry's decline in recent years, there also are some weaker regions in Baden-Württemberg (for example, Alb/ Sigmaringen). Further, the withdrawal of the U.S. Armed Forces from some locations will have economic consequences.

Some of the most important pillars of the economy, such as the automotive industry (DaimlerChrysler, Porsche, Audi) and its suppliers will remain in Baden-Württemberg.

Prices are determined under the assumption that previous backing, owner-occupier grants, and construction child allowance in its present form (backing since 1/1/2017) will remain unchanged, and interest rates will remain at their current low level. Efforts are being made by the German government to modify the backing and/or get rid of it altogether. Apart from pure financial criteria, in terms of successful renter privatisation, the following ratio frequently is a deciding factor: "Monthly charges before the purchase, and monthly charges after the purchase," the so-called additional charge billing. Therefore, the inclusion of backing funds for buyers basically is of economic interest.

		Privatisation quota Tenants (un-weighted)	Privatisation quota Total sales (un-weighted)	Rent PDB actual all ent	Rent domestic r dus	Rent PDB local compar able rent	Rent PDB marke t rent	Privatisation priority RES
Cluster 1- ■	Privatisation No Cumulative	■	■					■
Cluster ■	Privatisation No Cumulative	■	■					■
<b>Total</b>	<b>Privatisation No Cumulative</b>	■	■	■	■	■	■	■

Rents, however, were not outbid in all areas. As for the market rent, there still is a potential for increases between 10 and 15%. With new leases the increase may be even greater — depending on location and demand in individual sections of the market. In our study, we assumed that technically the residential facilities are well maintained.

In our study, we differentiated between five privatisation priorities. Class 1 (as a rule, single family houses or row houses) and class 2 properties (as a rule, properties with 2 or three floors, plans in demand, loose development) are particularly suitable for privatisation.

Class 4 and 5 properties (high-rise housing estates focusing on social housing, lodging houses, and homeless shelters, student hostels, etc.) as a rule are not suitable, or only suitable to a limited extent, for privatisation. The privatisation class may be improved if from the beginning these facilities are run by an accommodation management.



## Own Publications

1. Reddehase, R.: Systematization of housing privatization in Germany“ (Paper) European Real Estate Society, ERES 2012, Edinburgh 2012 (International Scientific Conference)
2. Reddehase, R.: Due Diligence & Housing Privatisation - Development of the Privatisierungs-Analyse-Modell. “Economy, finance and Management of Companies – Year 2011” Bratislava 29.9.2011 (ISBN 978-80-225-3253- 2) (International Scientific Conference)
3. Reddehase, R.: Bahn- und Städtebauprojekt Stuttgart 21 als Teil der Magistrale Paris – Bratislava – Immobilienwirtschaftliche Bedeutung [Railway and urban development Stuttgart 21 as part of the Magistrale Paris - Bratislava – Real Estate economic importance] Bratislava 2010, FBM WU in Bratislava zum 70. Jubiläum der Wirtschaftsuniversität in Bratislava) (International Scientific Conference)
4. Reddehase, R.: Potenziale und Grenzen elektronischer Bewertungshilfen [Potentials and Limits of Electronic Assessment Aids]. In: Immobilien & Finanzierung – Der langfristige Kredit, 7-2011, P. 436 – 438 (ISSN 1618-7741) (Expert report)
5. Reddehase, R.: Renaissance der Wohnimmobilien – Chance 2009 [Renaissance of the residential real estate - Chance 2009]. In: Immobilien & Finanzierung – Der langfristige Kredit, 6-2009, P. 290 – 291 (ISSN 1618-7741) (Expert report)
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7. Reddehase, R. Investments in Wohnimmobilien – Chance 2014 [Investments in residential real estate - Chance 2014]. In: Plötz Immobilienführer Deutschland 2014. Berlin Köln 2014. P. 18 – 20 (ISBN 978-3-89984-331-6) (Expert report)
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9. Reddehase, R.: Immobilienbewertung – Grundlagen [Property valuation - basics], Hochschule Biberach. Stuttgart 2010 (lecture notes)
10. Reddehase, R.: Immobilienmarketing [Real estate marketing], Akademie der Immobilienwirtschaft. Stuttgart 2015 (lecture notes)
11. Reddehase, R. Vorstellung Royal Institution of Chartered Surveyors – RICS [Presentation of real estate association RICS], Akademie der Immobilienwirtschaft. Stuttgart 2015 (lecture notes)
12. Reddehase, R. Privatisierung von Wohnungsbeständen – Beispiel Wohnpark Grünblick in Böblingen [Privatisation of housing estates - Example Immotop in Böblingen]. Duale Hochschule Baden-Württemberg. Stuttgart 2011 (lecture notes)

13. Reddehase, R.: Investitionen in Wohnimmobilien Due Diligence – Wohnungsprivatisierung und Marketing [Investments in residential real estate Due diligence - residential privatisation and marketing], Duale Hochschule Baden-Württemberg, Stuttgart 2010 (lecture notes)
  
14. Reddehase, R. / Brost, M.: Der Immobilienmakler ist der ehrlichste Beruf der Welt [The real estate broker is the most honest profession in the world]. Stuttgart 2011 – Verbandszeitschrift IVD Deutschland (Expert report)
  
15. Reddehase, R.: Stuttgart 21 – Immobilienwirtschaftliche Bedeutung, Stuttgart 21: Immobilienwirtschaftliche Bedeutung - Bahn- und Städtebauprojekt Stuttgart 21 aus Sicht der Immobilienwirtschaft [Real-estate relevance, Stuttgart 21: Real-estate significance - railway and urban development project Stuttgart 21 from the perspective of real estate management], Diplomica Verlag Hamburg 2011 – Bibliographies, publishing August 2011 (ISBN 978-3-8428-6451-1) (monograph)
  
16. Reddehase, R.: Bahn- und Städtebauprojekt Stuttgart 21 als Teil der Magistrale Paris-Bratislava - Akzeptanz innerhalb der Stuttgarter Immobilienwirtschaft und Refinanzierung des Projektes durch freiwerdende Grundstücksflächen [Bahn- und Städtebauprojekt Stuttgart 21 as part of the Paris-Bratislava motorway - Acceptance within the Stuttgart real estate business and refinancing of the project through free-growing land], Stuttgart 2009, since Juli 2011: Diplomica Verlag Hamburg (ISBN 978-3-8428-1357-1) (Master Thesis)
  
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