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***Is there a link between spatial theories and retail property Investments within the urban area?
The situation of German discounters.***

Summary

Retail property is generally associated with Shopping Centres or Real Estates in the CBD, which are much more prestigious than big boxes in the suburbs. But from a quantitative point of view, the impact of Retail Properties like supermarkets, discounters or hypermarkets has been increasing for the last 30 years. Spatial based theories on retail locations as stated by Agergaard, which explain the retailers' siteselection assuming a rising income and increasing mobility on part of the consumers as well as to a permanent enhancement of operational forms, predict a relocation of retail properties to suburban areas, however, these theories disregard the characteristics of real estate markets.

The following article shows, exemplified by the German discounter-market, how characteristics and protagonists of real estate submarkets influence the retailers' siteselection. Therefore, economic elements of real estate appraisal and spatial analysis are combined in a theoretical approach in order to account for retailers' future siteselection in the urban area based on economic and spatial facts.

1. Introduction

The term ‘commercial real estate’ is usually associated with shopping centers, though they make up only a small part of retail properties with simple design - such as discounters. Nevertheless, both German and English literature focuses on the Shopping Center as a subject ¹ (see STURM 2006, BESEMER 2007), while specialty stores and discounters are only selectively considered (see HEERDE ET AL. 2009). As early as 1970, AGERGARD ET AL. have forecasted the decrease of sales outlets in the inner cities compared with the periphery and the increasing importance of new forms of business (such as discounter), but without going into real estate-specific characteristics (see AGERGARD ET AL. 1970). These characteristics are crucial for commercial success and for the value of the commercial property, because in commercial real estate, the turnover to be achieved is rented, not the space.

Here, the essential idea is to link the theory of institutional change (AGERGARD ET AL.) to real estate investments which is exemplified on the German discount food retailers. This will be done by translating the statements of the approach of AGERGARD ET AL. to the appraisal of real estate. Therefore, the central question handled in this article is:

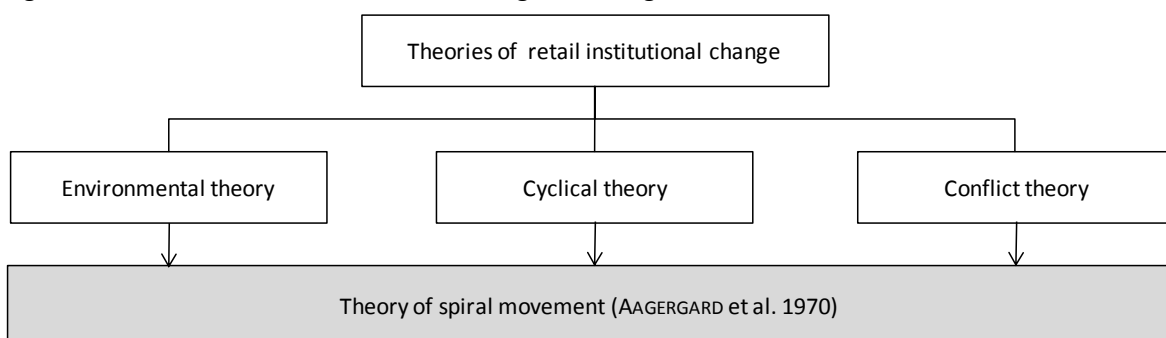
Do theoretical approaches of institutional retail change have an effect on real estate appraisal and hence on the investment of real estate?

To answer this question

- the spatially-based model according to AGERGARD ET AL. is outlined first, then
- the theories are tested for their relevance using the example of German food discount stores, and
- ultimately their significance for the property appraisal is derived.

2. Theory of institutional change according to Agergard et al.

Figure 2-1: Theories of retail institutional change according to BROWN 1987



Source: Brown 1987, p. 182

In the summary of the institutional changes, BROWN 1987 subdivided the postulated theories into the environmental, the cyclical and the conflict approach (see figure 2-1).

The theory of AGERGARD ET AL. is special in that it integrates the otherwise separately considered theoretical approaches and explains the institutional change in the retail sector using the combination of

¹ see Journal of Leisure Property and Journal of Shopping Center Research

environmental influences, cyclical phenomena, and the cutthroat competition of individual types of operation. As a result of the integrative approach, AGERGARD ET AL. postulate the “spiral movement” of institutional forms which describes the search for qualitative improvement and quantitative change in price, product range and area of existing institutional forms of business, which leaves a gap in the retail stocking both in quality and in spatial form.

Rising incomes and an improved transport system as a starting point

According to AGERGARD ET AL., rising incomes, more available free time, an increasing mobility and a reduction of labor costs are reasons for new retail formats, which are characterized by a sales area increase, specialization, and chain stores, serving a larger catchment area to be economically successful. In addition to these exogenous factors, endogenous parameters such as price, service, product range and distance have a decisive influence on the development of the stationary retail trade - in terms of the conflict perspective. According to AGERAGRD et AL., one has to consider the internal factors as “game opportunities” and must optimally combine them with given environmental factors. Finally, the “spiral movement” integrates the cyclical component of the approach of the institutional change. It predicts the respective institutional form to achieve a higher level analogical to the growing demands of customers. This rising is expressed in higher price levels, better quality, greater range, and larger sales areas. The emerging gap on the lower level is filled by new forms of operation. From a geographical point of view, the larger dimensions of institutional forms lead to a decentralization along the entry and exit roads as a result of the mostly radial designed transport systems. According to the theory of "spiral movement" an oppositely directed compensatory movement emerges and the resulting gaps in the retail stocking are replaced by new formats.

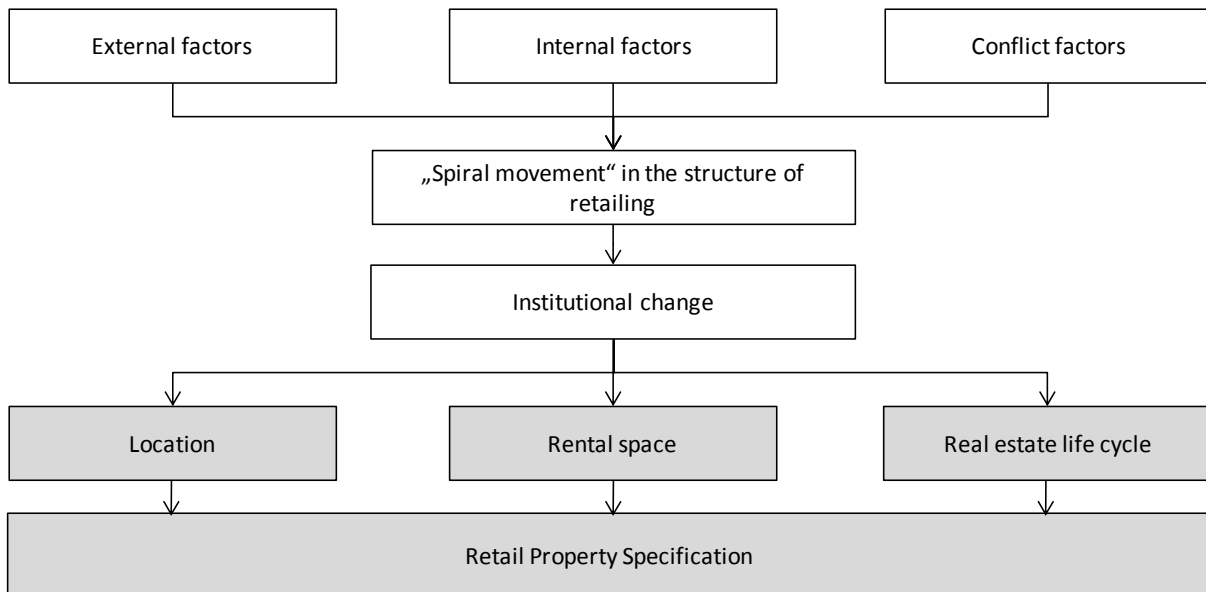
The assumptions of steadily growing income, unrestricted mobility of the population and the increasingly available leisure time are no longer applicable to all sections of society because of changing economic conditions and changing daily patterns of activity. Even though, the implications of AGERGARD ET AL. are still valid. Therefore, parallel to the development patterns of AGERGARD ET AL., that is the quest for qualitative improvement and quantitative change in price, product range and area, permanently pursued low-cost or high-cost strategies are to be awaited.

Input for retail properties

AGERGARD ET AL. consider the institutional change from the perspective of trade and disregard real estate conditions and conclusions. However, from the combination of the “spiral movements” with the progressive institutional change, it follows that there is a direct influence on the retail property specification (see Figure 2-2) with the following configuration:

- Peripheral locations are favored because of the accessibility and virtually unlimited availability of space
- More rental space is needed for the presentation of the goods in the context of increasing consumer demands and the related efforts of improving the quality of type of business
- The crowding out of types of business and the emergence of gap-fillers always require new specific surface cuts and results in a short economic life cycle of retail property.

Figure 2-2: Implications of the theory of Agergard on the retail property specification



Source: Following AGERGARD ET AL. 1970

This theoretical approach (AGERGARD ET AL.) should be taken into account for the appraisal of retail properties and retail properties investments: the location and the rental space changes in demand, resulting in a shorter economic life cycle of real estate, which it has to be mapped in the appraisal of retail property.

3. The example of the German discount food retailers

The discount food retailers is a German success story with companies such as Aldi or Lidl now sharing 40.8 percent of the market - as measured by sales in the German food retailing (see, EHI, 2009, p.179). This form of operation may thus provide an ideal population to the test the plausibility of the approach of AGERGARD ET AL. and to connect it then to real estate investments.

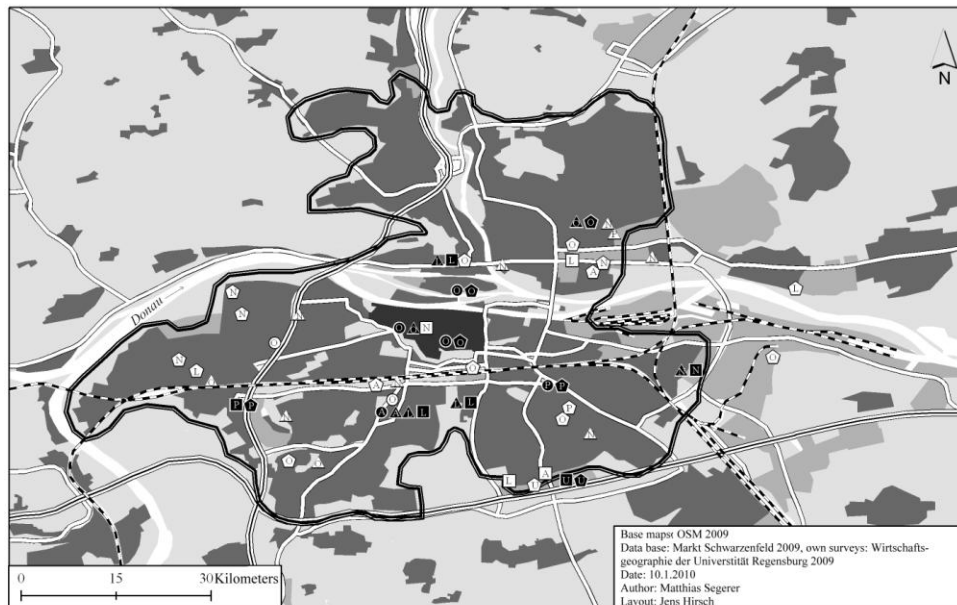
Application of the "spiral movements" on the German discount food retailers

The food discounter format is the answer to the gap which growing supermarkets and department stores left in the 1970s. For the idea of the limited range of goods at cheap prices does exactly focus on the weakness of the existing formats. At the same time, with its appearance the discounter are also subject to the ongoing transformation of the "spiral movements", which predict an area growth, higher prices, improved product quality at decreasing personnel costs and a relocation from the city center towards the periphery. Another reason for the emergence of discount stores beyond the theory of AGERGARD ET AL. is the hybridity of consumers outlined in Chapter 2, which results due to changing economic and social conditions and leads to both low-cost and high-cost strategies.

As in the whole retail industry, the average sales area per discount food retailer store grew, namely from 525 m² in 2001 to 646 m² in 2008 (see EHI 2009, p.300). On the one hand, this is due an increase of the range of goods, as predicted by AGERGARD ET AL., which has increased from about 200 articles at the beginning of discount food retailing to an average of 2028 articles (see EHI, 2009, p.310) and on the other hand due to the substitution of personnel by sales area, even though the

area productivity of the discounters rose - unlike the whole food retail industry - from € 3,836 / m² in 2001 to € 4,580 / m² in 2008. It is difficult to provide evidence of improved product quality at food discounters, whereas in this context, the so-called discount brands now also distribute very much brand-name products alongside its own brands. Hence discounters increasingly offer products which were originally reserved for other institutional forms. The theory of "spiral movements" is generally also correct with regard to the choice of location of food discounters. The case study of Regensburg (Figure 3-1) clearly shows that food discounters have first established their chain stores in the city and then progressively moved to peripheral locations along radial roads.

Figure 3-1: site relocations of discount food-retail since 1990



Discounter

Market entry / Market exit

- 1987
- ▲ 1994
- 2003
- ◆ 2008

- Real estate use**
- no longer in use
 - in use

Sales division

- A Aldi
- L Lidl
- N Netto
- O Norma
- P Penny
- U Plus

Examples:

- ▲■◆ Market entry Aldi 1987, exit 1994
- ▲■◆ entry Lidl 2003, exit 2008
- Market entry Netto 1987, in use

Land use

- Downtown
- Resident use outweighs
- Commercial use outweighs
- Other use

Area of consistent residential development

Transport devices

- Main road
- Highway
- Railway

Source: SEGERER 2010, p. 22

The only prediction of the "spiral movements" theory which turned out to be wrong is that of a continuously rising price level. This is partly due to the underlying business philosophy of the discount companies which AGERGARD ET AL. did not explicitly take into account. Besides, the intrainstitutional cutthroat competition, which does not play a significant role according to the theory of AGERGARD ET AL., rather leads to price reductions than to an increase of price. But taken all together, the theory of "spiral movements" is broadly supported by the form of food-discount retailers' development in Germany. In the following, implications of the theory of AGERGARD ET AL. shall be connected to real estate investments.

Implications of the "spiral movements" on the discount retailers real estate

The 'spiral movement' has an effect on the retail property by means of increasing needs for sale area, gain in importance of peripheral locations and a shortened life cycle. Thus, the relationship can

be assessed as follows:

- **Peripheral locations** dominate the site selection of discount food retailing companies (see Figure 3-1)
- An **increase of sales area** in the discounter food retail stores
- A **short economic life cycle** resulting from institutional changes and the issue of sustainability of a business concept

The application of the theory of AGERGARD ET AL. on the special case of the discount food retailers' real estate needs yields a modified functional chain of several stages, which is depicted in Figure 3-2. According to this stage model, in the first stage the type of the business is adjusted to the existing property. In the second stage, the property is adapted to the operational concept and features some object specific or rental agreement specific characteristics. In the case of discount food retailers their specific property requirements substantiate the general terms of the impact of institutional change from Figure 2-2 and lead to its own type of real property: "discounter retail property". On the one hand, the conceptual design is solely oriented to the type of business, from an institutional point of view. On the other hand, more than 15,000 sales outlets are operated as food discount stores, all of which are in accordance with nearly all of the property specifications described in Figure 3-2.

On this basis, the property type "discount retail property" can be defined as follows:

A discount property consists of a site, a building and associated outdoor facilities, which permit to offer a close, rapid turnover oriented sales range at low prices, with the buildings generally not exceeding a maximum floor area of 1,200 m² and localized on a site of the secondary distribution network with sufficient space for parking.

(SEGERER 2010, p.5)

The business principle of minimizing the costs of operation is also reflected in the design of the property, it is settled by a simple construction. Thus, from the object-specific features of a discounter retail property results an additional shortening of life cycle - which derives itself from the institutional change - due to

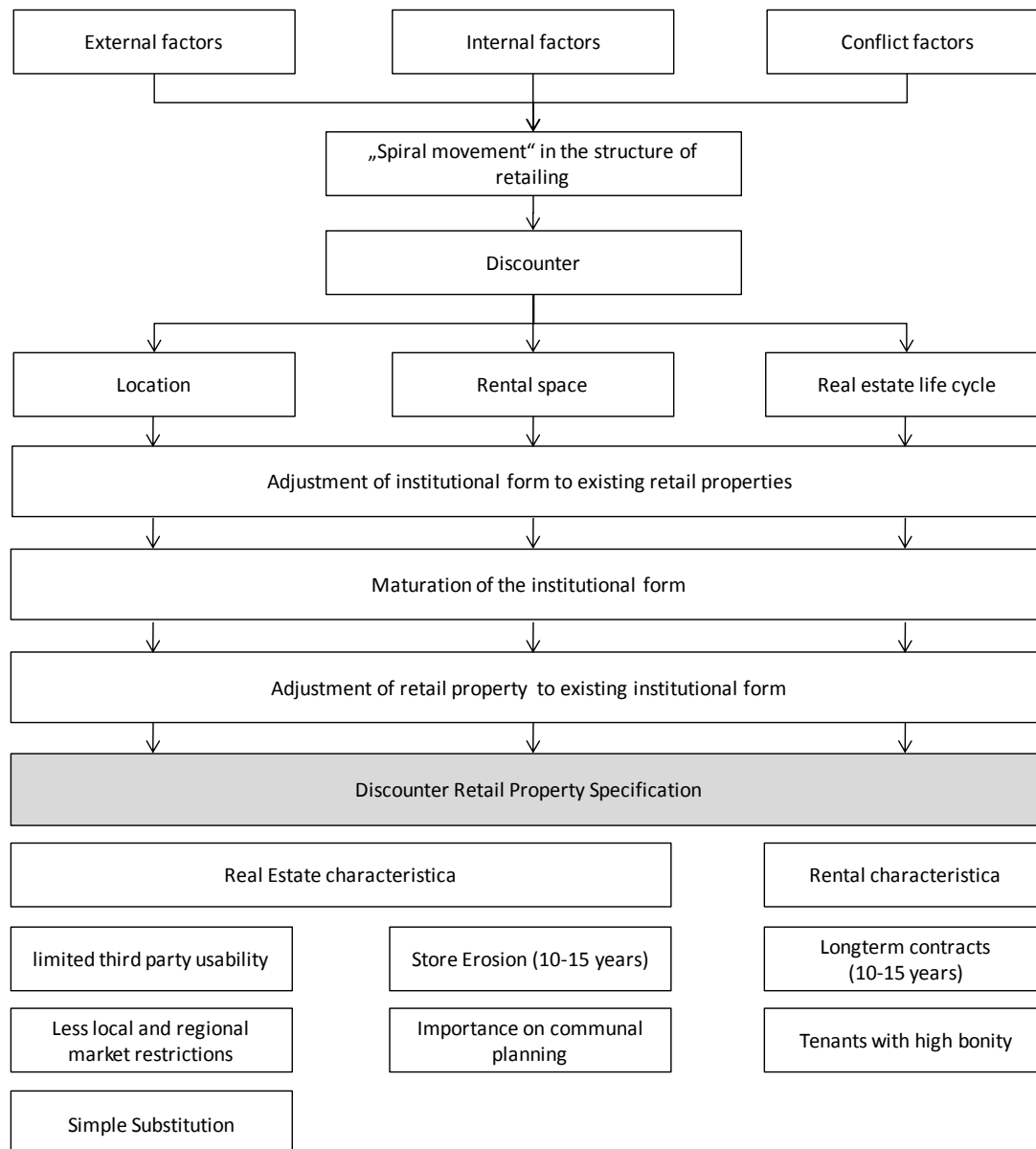
- a limited third party usability,
- a rapid wear of the store equipment,
- a slight substitution of existing ones and
- low market restrictions (see Figure 3-2)

The duration of the first term of the lease is adapted to the technical design, whereas the tenants of the discount food retail are characterized by an excellent credit rating. One final characteristic that emerges less from theoretical considerations but rather from the approval practice to these objects is the importance of municipal planning. According to German planning law, a compatibility tests is necessary if the size exceeds a rental space of 1,200 m², so the design of greater discount stores is very uncommon.

With respect to the central question, that is the impact of the theory of AGERGARD ET AL. on the investment of real estate, one has to transfer these features arising from institutional change in form to the real estate appraisal and thereby implement the "missing link" between the commercial-

making theory and investment considerations.

Figure 3-2: Implications of the theory of Agergard on the discounter retail property specification



Source: Own presentation according to ALTENSCHMIDT/STEINERT 2007, p.225ff. and RICHOLT 2008, p.131

4. Importance for property appraisal

On the one hand, the location, the rental space and the life cycle of a property is influenced by the impact of the theoretical approach to AGERGARD ET AL. via the institutional change. On the other hand has the "system" discount food retailing now so evolved in Germany that the real estate type "discount retail property" is postulated on the basis of the business model in the context of this essay.

These two aspects have a profound impact on the appraisal of retail property in the investment market in the market segment of food discount stores, and thus have to be taken into account in rating methodology. Following the common practice of commercial real estate appraisal, the international DCF procedures are outlined on the basis of discount real estate of the German food retail. Then, the input from the theory of AGERGARD ET AL. is embedded into the appraisal of retail property.

Appraisal of discounter retail property with DCF method

The international procedure for appraising commercial properties incorporates all flows of payment of the lease and attempts to project all risks of future cash flows in the interest rate. Usually, the application of the DCF method takes the following form:

$$(1.1) \quad MV = \sum_{t=1}^n \frac{IS_t}{(1+i)^t} + \frac{RV}{(1+i)^t}$$

with the following subdivision of time intervals normally put on:

$$(1.2) \quad MV = \sum_{t=1}^n \frac{IS_{t_1}}{(1+i)^{t_1}} + \dots + \frac{IS_{t_{10}}}{(1+i)^{t_{10}}} + \frac{IS_{t_{10}} \times GIM}{(1+i)^{t_{10}}}$$

<i>MV</i> = Market Value	<i>t</i> = Period (1 year)
<i>IS</i> = Income surpluses	<i>GIM</i> = Gross Income Multiplier
<i>RV</i> = Residual Value	<i>i</i> = interest

The specificity in the appraisal of discounter retail property is the short residual life cycle that is declared a special case by GIF in 2006 and must be adequately taken into consideration when determining the market value (see, GIF, 2006, p. 13). On this basis, the formal representation of cash flows has to be modified as follows:

$$(1.3) \quad MV = \sum_{t=1}^n \frac{IS_{t_1}}{(1+i)^{t_1}} + \dots + \frac{IS_{t_{EEU}}}{(1+i)^{t_{EEU}}} + \frac{LV-DC}{(1+i)^{t_{EEU}}}$$

<i>EEU</i> = End of Economic Use	<i>LV</i> = Land value
<i>DC</i> = Demolition costs	

The directive recommends to map all periods within the maximal economic life of 25 years (see ROTKE / WERNECKE, 2008, p.214) in detail and to add the residual value, which is the difference between land value and demolition costs. Thereby, the short life expectancy of simply constructed retail property, like discounter retail property, is taken into account to prevent an overvaluation of the real estate section of the market.

Link between theory according to Agergard and real estate appraisal

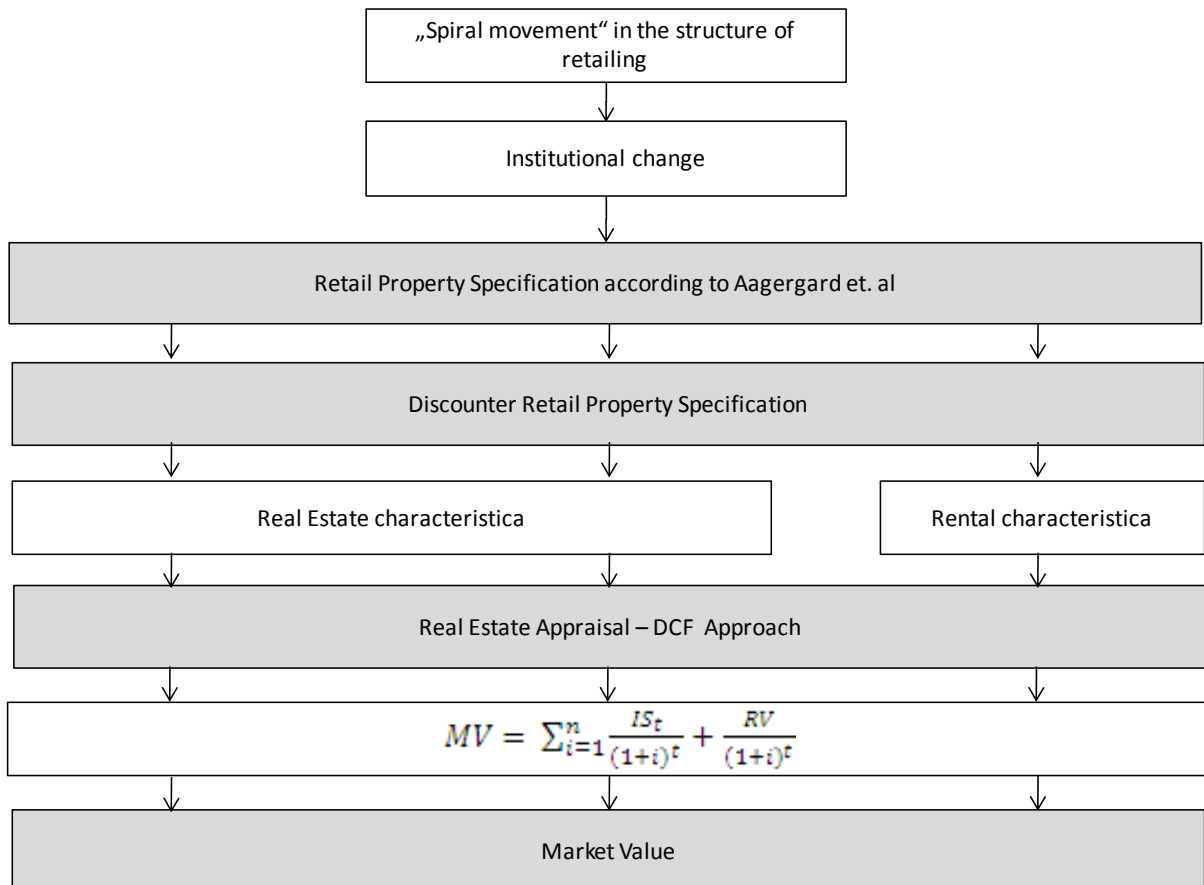
The pricing method for the market value of discounter retail property postulated by GIF (1.3) takes the shortened life cycle explicitly into account. This shortened life cycle was motivated by an institutional change of business that resulted in specially designed retail property for discounters, as described in Chapter 2.

The theory of "spiral movement" (AGERGARD ET AL.) predicts a fixed sequence of institutional changes and in this article it shall be demonstrated that this predictions also apply to the German food discounters. It is this continuous change in the type of stationary trade, that has a direct impact on the property specification that is also reflected in retail property of discounters with a clear tendency towards peripheral locations and a shortened life cycle (see Figure 4-1).

In the case of discounter retail property such general properties are complemented with specific characteristics, which make the object to appear attractive at the time of construction, but after the expiry of the first, credit standing lease the following points put an adequate demand into question:

- Strong signs of wear
- Relatively high revitalization costs compared to the investment costs
- Limited potential for third party use
- Simple substitution of existing outlets with new buildings

Figure 4-1: Impact of AGERGARD on Real Estate Appraisal



Source: Own presentation

For the methodology of appraisal of discounters' real estate, it is therefore necessary to take the limited potential for subsequent use after the first lease into account as well, because sales areas no longer marketable in the secondary use have reduced rental income results, which can range up to vacancy after the first term of lease.

$$(1.4) \quad MV = \sum_{t=1}^n \frac{IS_{t_1}}{(1+i)^{t_1}} + \dots + \frac{IS_{t_{ECL}}}{(1+i)^{t_{ECL}}} + \frac{IS_{ECL} \times RF \times (1+i)^{t_{EEU} - t_{ECL}}}{(1+i)^{t_{ECL}}} + \frac{LV - DC}{(1+i)^{t_{ECL}}}$$

EEU = End of Economic Use *ECL = End of contract of lease* *LV = Land value*
DC = Demolition costs *RF = Reduction factor (0 ≤ RF ≤ 1)*

As a consequence for property appraisal, incomes from the contract of lease assured by strong tenants have to be periodically mapped, whereas a reduction factor (RF) must be assigned to the re-

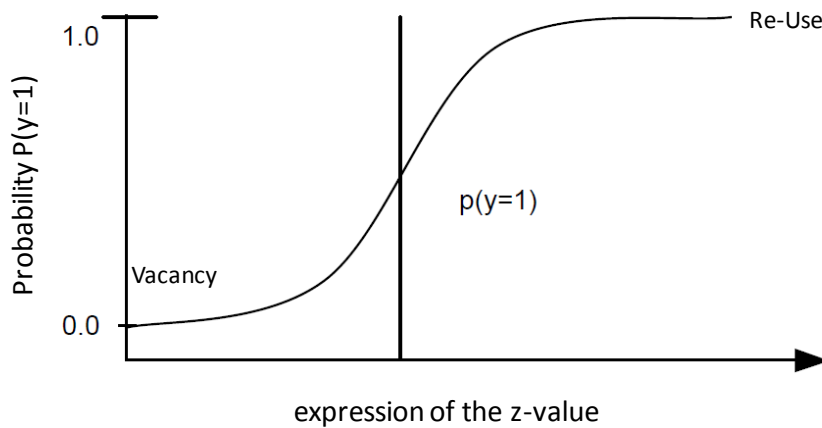
maintaining years of economic life. This reduction factor asserts the possibilities of reuse of discounter property and is then capitalized with the interest rate i over the remaining time of economic use (see equation 1.4.). This residual rental income is increased - as shown in equation 1.3 – by the difference between the land value and and demolition costs.

Quantification of a reduction factor to evaluate the reuse of discounter retail property

In order to obtain a realistic reduction factor for the valuation of discounter retail property, it is reasonable to use a rating approach, as it yields a probability of choice in the form of a discrete discount factor on the basis of a cost-benefit analysis (see NENTWIG 2009, p. 367).

Figure 4-2: A theoretical approach using a Logit-model for predicting the re-use of discounter retail property

$$p(y=1) = \frac{1}{1+e^{-z}} \quad \text{with} \quad z = b_0 + b_1x_{i1} + b_2x_{i2} + \dots + b_jx_{ij} + \dots b_kx_{ik}$$



According to AGERGARD with explanatory variable

- rental space
- location
- remaining life expectancy

additional explanatory variable

- retail company
- coupling potential
- more variable for completion

Source: Own presentation according to BACKHAUS & AL. 2006

Another possibility, which is more purposeful according to the authors, is to implement a constant reduction factor, based, for example, on a logistic distribution. A first theoretical approach to problem of quantifying the probability of subsequent use is a logit model (Figure 4-2), which incorporates real property specifications as derived from the theory of AGERGARD ET AL. This model shall be expanded to include further explanatory variables derived from real estate praxis to attain an adequate validity.

5. Summary and perspective

There is no type of real estate for which there exists such a close link between buyers and sellers as for retail property, because those objects can only be used when their conception is suitable for the operation forms currently marketable. In this context, theories about the development of institutional forms, as in AGERGARD ET AL., constitute a significant foundation for predicting future space requirements of traditional retailing, although consequences for the real estate economy can only be derived indirectly.

The example of discounter retail property of the German food retailing shows that there is a close link between spatially-based theories about the institutional change and real estate investments. The institutional change implies specific real estate requirements that must be included for the appraisal of property, although the purely geographic-based implications take only a secondary role to the object-specific properties. In the special case of discounter retail property, it is the methodological separation of contract of lease and remaining useful life and the introduction of a reduction factor, an assertion about the possibility of re-use. In this context, the proposed approach of a logit model to predict the probability of re-use of such objects has to be further substantiated. That way, a connection between a static, reference date related method of appraisal and a dynamic process aimed at the future is established.

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