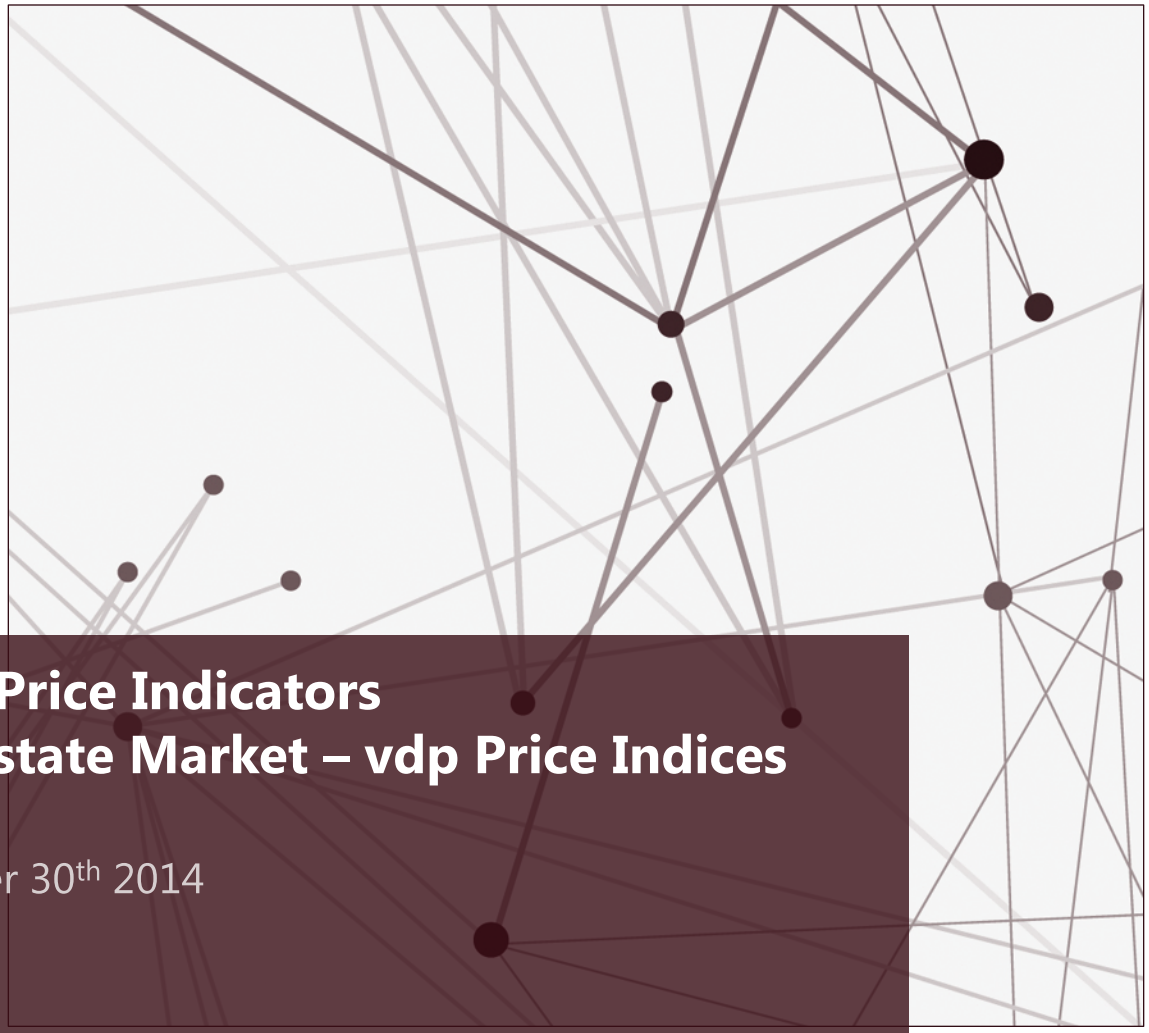
vdpResearch



Commercial Property Price Indicators for the German Real Estate Market – vdp Price Indices

Frankfurt am Main, September 30th 2014

Andreas Kunert

Introduction

Background

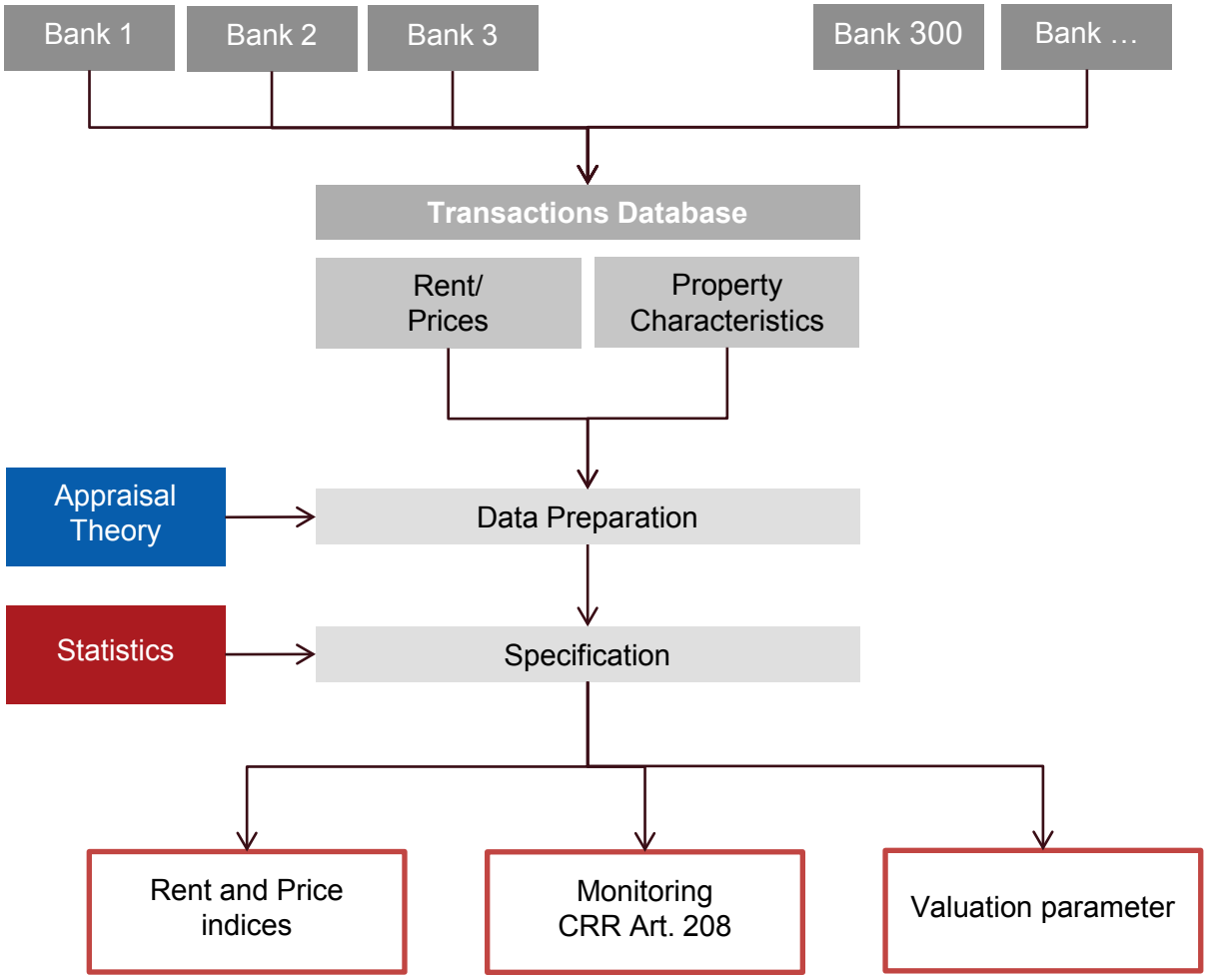
vdpResearch was founded in 2008 as a 100 % subsidiary of the Association of German Pfandbrief Banks.

Primary Aims:

- Analysis and forecast of real estate markets from the view of the German financial industry.
- Providing actual market information such as rents, prices, etc. for use in property valuation.

In order to fulfill their aims, vdpResearch operates a transaction database that is quarterly updated by the participating banks.

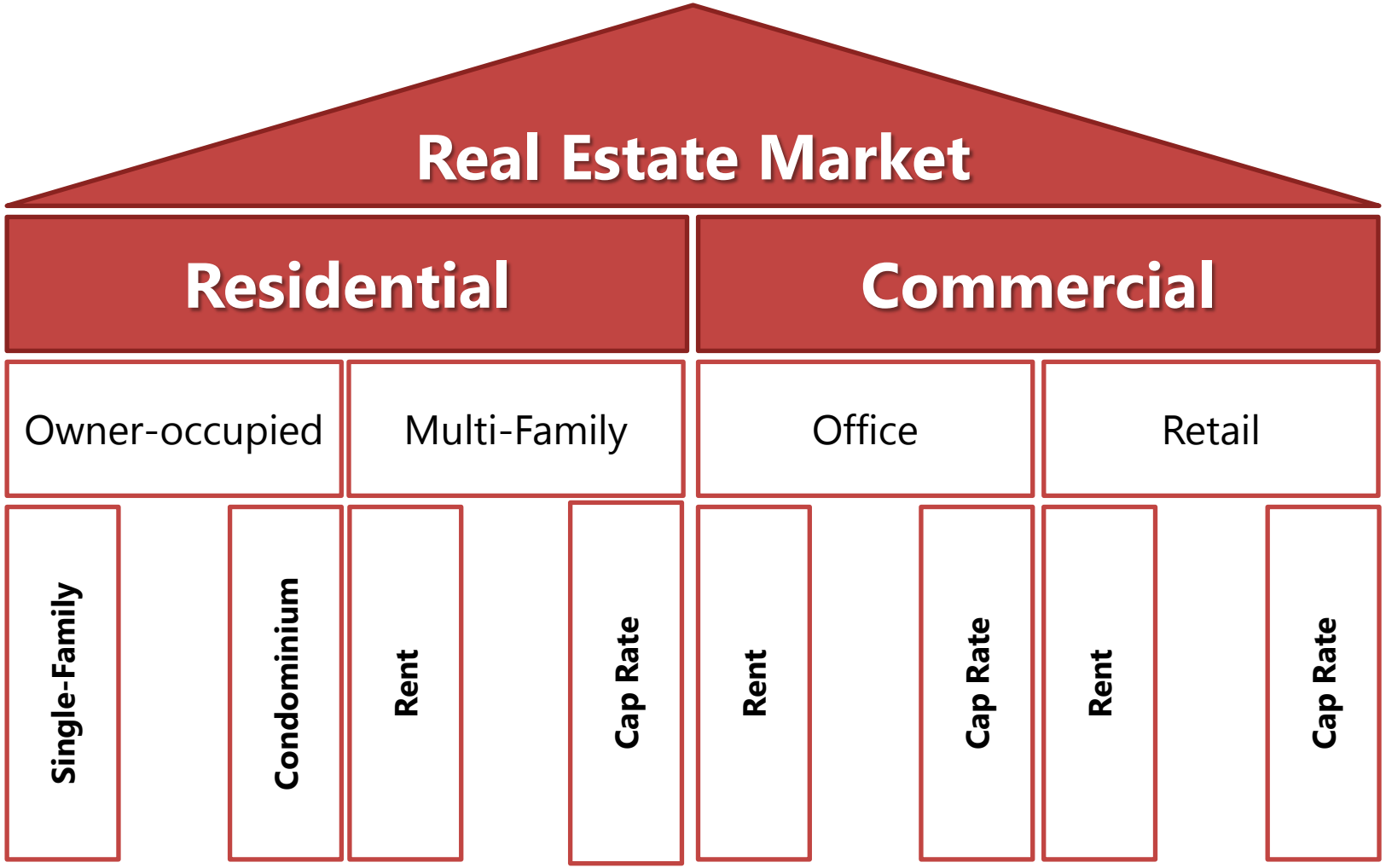
Use of Transaction Data in Collateral Risk Management



Currently the database consists about 2.3 million observations ,of which 1 million are currently in use for analysis.

Each quarter there are 60.000 new observations.

vdp-Index family Real Estate Prices



Three Approaches to Value

- Sales comparison
  - Is most useful when a number of similar properties have recently been sold or are currently for sale.

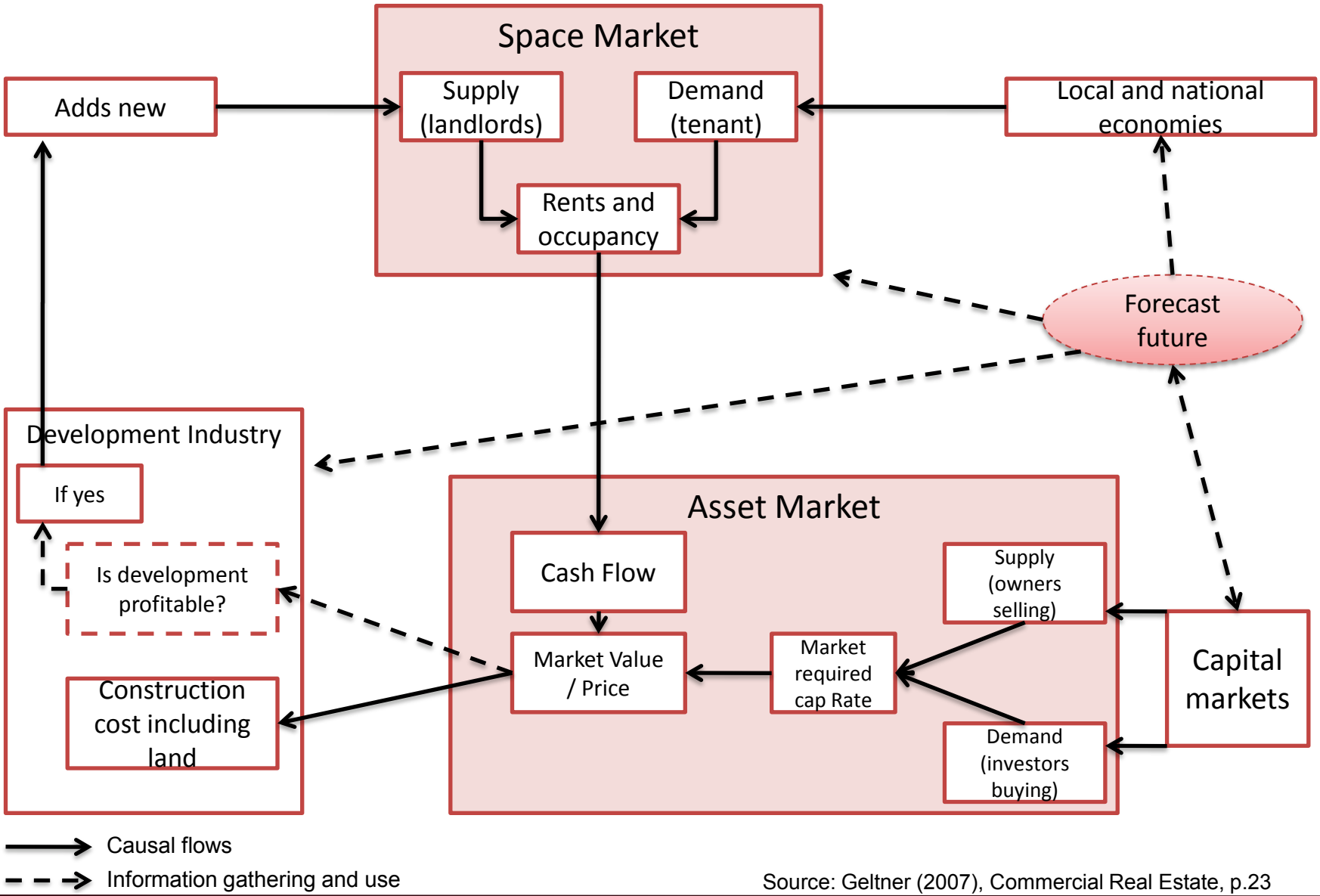
- Depreciated replacement cost
  - Value is derived by adding the estimated value of the site to the current cost of constructing a reproduction or replacement for the improvements and then subtracting the amount of depreciation in the structures from all causes.

- Income capitalization
  - In the income capitalization approach, the present value of the future benefits of property ownership is measured.

Source: The Appraisal of Real Estate (2008)

INDEX CONSTRUCTION

The Real Estate System



Source: Geltner (2007), Commercial Real Estate, p.23

Income Capitalization Approach

The idea of the income approach is to determine what the typical investor would be willing to pay for the stream of income that is expected for the property. This method would normally require that all cash flows for the economic life of a property be estimated and then discounted at the appropriate rate. In practice, simplified methods are generally used.

(1) $$\text{Price}_t = \text{MV}_t = \frac{\text{NOI}_t}{1+\text{r}_t} + \frac{\text{NOI}_t(1+\text{g}_{t+1})}{(1+\text{r}_{t+1})^2} + \frac{\text{NOI}_t(1+\text{g}_{t+2})^2}{(1+\text{r}_{t+2})^3} \ldots + \frac{\text{NOI}_t(1+\text{g}_{t+n-1})^{(n-1)}}{(1+\text{r}_{t+n-1})^n}$$

NOI = Net operating income
g = Growth rate
r = Interest rate

If g and r are constant and n → ∞, then:

(2) $$\text{Price}_t = \text{MV}_t = \frac{\text{NOI}_t}{\text{r}_t - \text{g}_t} \Rightarrow = \frac{\text{NOI}_t}{\text{r}_t^{\text{rf}} + \text{RP}_t - \text{g}_t} \Rightarrow = \frac{\text{NOI}_t}{\text{CR}_t}$$

Cap rate **CR** includes implicitly
- expected inflation,
- risk-free rate and
- risk premium.

Source: Hoesli and MacGregor (2000)

Index Construction – Income Capitalization Approach

Space Market

User rights

Hedonic
Rent index

Asset Market

Property rights

Hedonic
Cap rate index

$$CV_t = \frac{R_t}{CR_t} \times 100$$

Capital value index
=
Rent index/Cap Rate-Index

Hedonic Models for Rents and Cap Rates

	Rent
Endogenous	Rent per sq. m.
Exogenous	Floor area
	Construction
	Location (object level) (1 – 5)
	Condition (1 – 5)
	Fit-out (1 – 5)
	Location (district level)
	Quarterly dummys

$$\ln(\text{Rent per sq. m}) = \alpha + \sum_{k=1}^{K} \beta X_{i,k,t} + \sum_{t=2}^{T} \delta D_{i,t} + \varepsilon_{i,t}$$

Hedonic Models for Rents and Cap Rates

	Rent		Cap rate	
Endogenous	Rent per sq. m.		NOI	
Exogenous	Floor area		Price	
	Construction		Remaining useful life	
	Location (object level)	(1 – 5)	Location (object level)	(1 – 5)
	Condition	(1 – 5)	Condition	(1 – 5)
	Fit-out	(1 – 5)	Fit-out	(1 – 5)
	Location (district level)		Location (district level)	
	Quarterly dummys		Quarterly dummys	

$$\ln(\mathrm{NOI}) = \alpha + \gamma \ln(\mathrm{Price}_{i,t}) + \sum_{k=1}^{K} \beta X_{i,k,t} + \sum_{t=2}^{T} \delta D_{i,t} + \varepsilon_{i,t}$$

with γ = 1

Hedonic Models for Rents and Cap Rates

	Rent		Cap rate	
Endogenous	Rent per sq. m.		NOI	
Exogenous	Floor area		Price	
	Construction		Remaining useful life	
	Location (object level)	(1 – 5)	Location (object level)	(1 – 5)
	Condition	(1 – 5)	Condition	(1 – 5)
	Fit-out	(1 – 5)	Fit-out	(1 – 5)
	Location (district level)		Location (district level)	
	Quarterly dummys		Quarterly dummys	

$$\ln(NOI) = \alpha + \gamma \ln(\text{Price}_{i,t}) + \sum_{k=1}^{K} \beta X_{i,k,t} + \sum_{t=2}^{T} \delta D_{i,t} + \varepsilon_{i,t}$$

$$CR = \frac{NOI}{\text{Price}} \quad \Rightarrow \left[\ln(CR) = \ln(NOI) - \ln(\text{Price})\right] \quad \Rightarrow \left[\ln(NOI) = \ln(CR) + \ln(\text{Price})\right]$$

Hedonic Models for Rents and Cap Rates

	Rent		Cap rate	
Endogenous	Rent per sq. m.		NOI	
Exogenous	Floor area		Price	
	Construction		Remaining useful life	
	Location (object level)	(1 – 5)	Location (object level)	(1 – 5)
	Condition	(1 – 5)	Condition	(1 – 5)
	Fit-out	(1 – 5)	Fit-out	(1 – 5)
	Location (district level)		Location (district level)	
	Quarterly dummys		Quarterly dummys	

$$\ln(NOI) = \alpha + \gamma \ln(\text{Price}_{i,t}) + \sum_{k=1}^{K} \beta X_{i,k,t} + \sum_{t=2}^{T} \delta D_{i,t} + \varepsilon_{i,t}$$

Comparable Sales

Hedonic Models for Rents and Cap Rates – Estimation Output and Sample Size

Rent			Cap Rate		
Variable	Coefficient	Significance	Variable	Coefficient	Significance
Multi-Family Houses					
C	-3.171	***	C	2.392	***
LOG(Price)	1.009	***	C_WFL	0.000	***
D_LAG_1	-0.046	***	D_LAG_1	0.122	***
D_LAG_3	0.026	***	D_LAG_3	-0.050	***
D_LAG_4	0.074	***	D_LAG_4	-0.101	***
D_LAG_5	0.092	***	D_LAG_5	-0.129	***
D_ZUS_1	-0.018	**	D_ZUS_1	0.039	***
D_ZUS_3	0.036	***	D_ZUS_3	-0.043	***
D_ZUS_4	0.076	***	D_ZUS_4	-0.083	***
D_ZUS_5	0.078	***	D_ZUS_5	-0.114	***
D_AUS_1	-0.028	***	D_AUS_1	0.103	***
D_AUS_3	0.017	***	D_AUS_3	-0.043	***
D_AUS_4	0.061	***	D_AUS_4	-0.092	***
D_AUS_5	0.130	***	D_AUS_5	-0.096	***
CY 1999-1999	0.028	***	CY 1999-1999	-0.076	***
CY 1980-1989	0.116	***	CY 1980-1989	-0.166	***
CY 1970-1979	0.143	***	CY 1970-1979	-0.173	***
CY 1948-1969	0.152	***	CY 1948-1969	-0.174	***
CY 1914-1947	0.112	***	CY 1914-1947	-0.170	***
CY 1850-1913	0.108	***	CY 1850-1913	-0.161	***
R-squared	0.712		R-squared	0.991	
Adjusted R-squared	0.708		Adjusted R-squared	0.990	

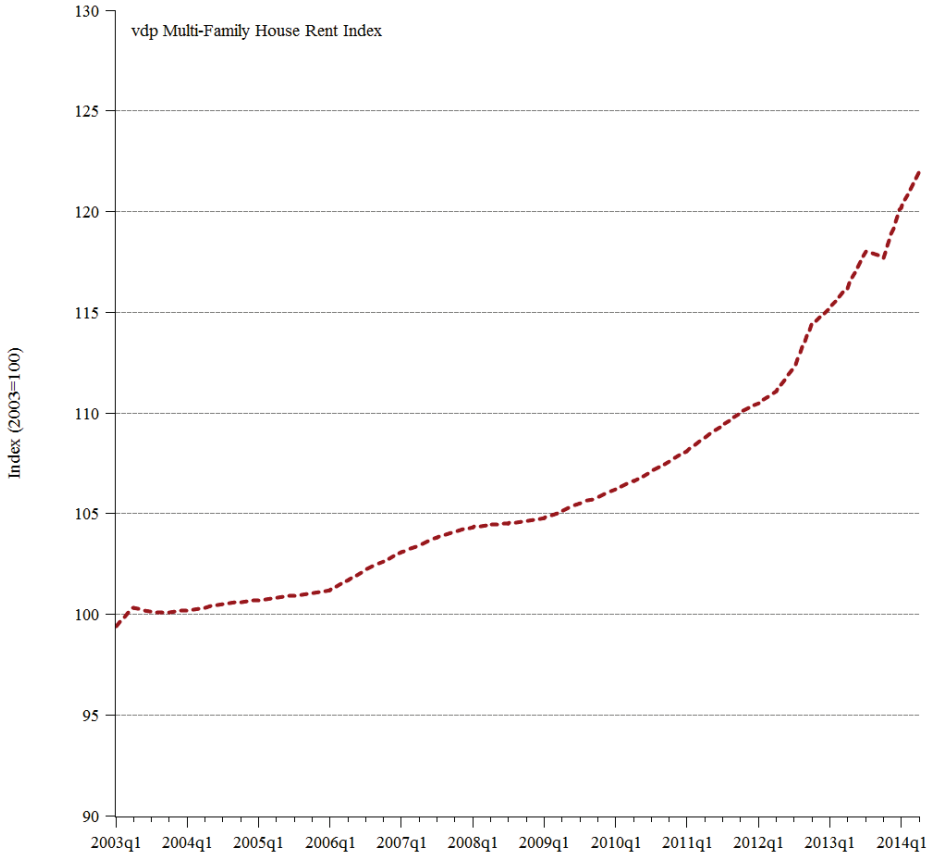
*** Significant at the 1% level
** Significant at the 5% level
* Significant at the 10% level

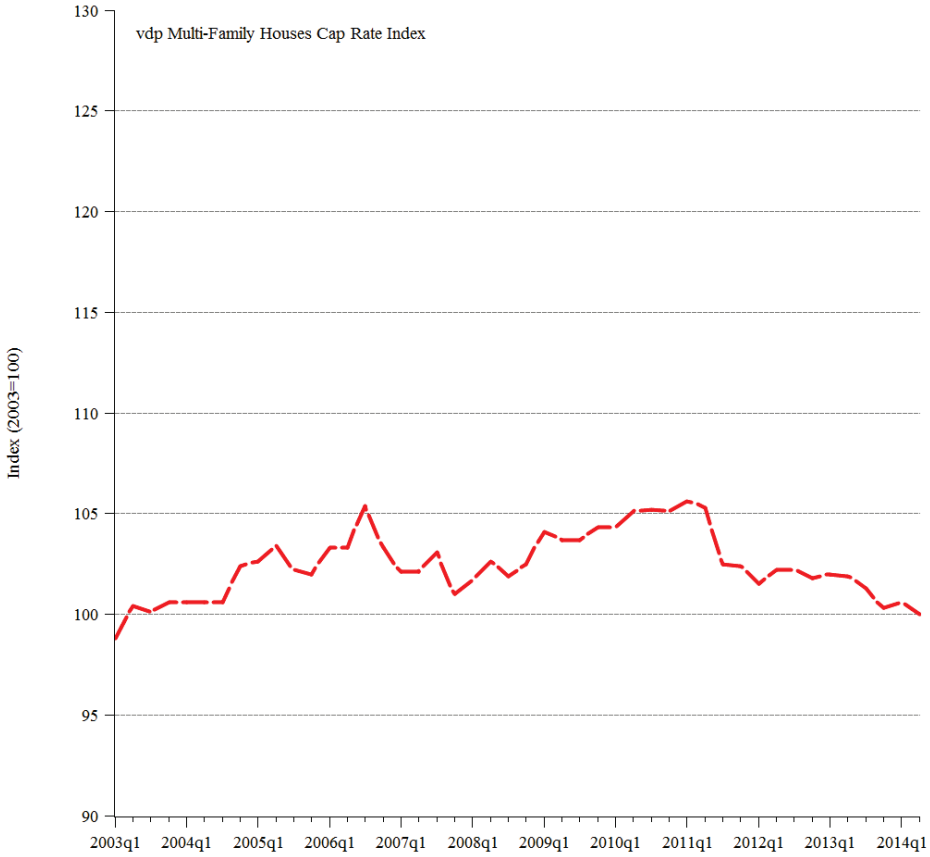
Sample Period: 2003 Q1 – 2014 Q2

Property type	Rent No. of contracts	Cap Rate No. of properties
Multi-family	185.000	68.000
Office	78.500	20.200
Retail	43.800	13.900

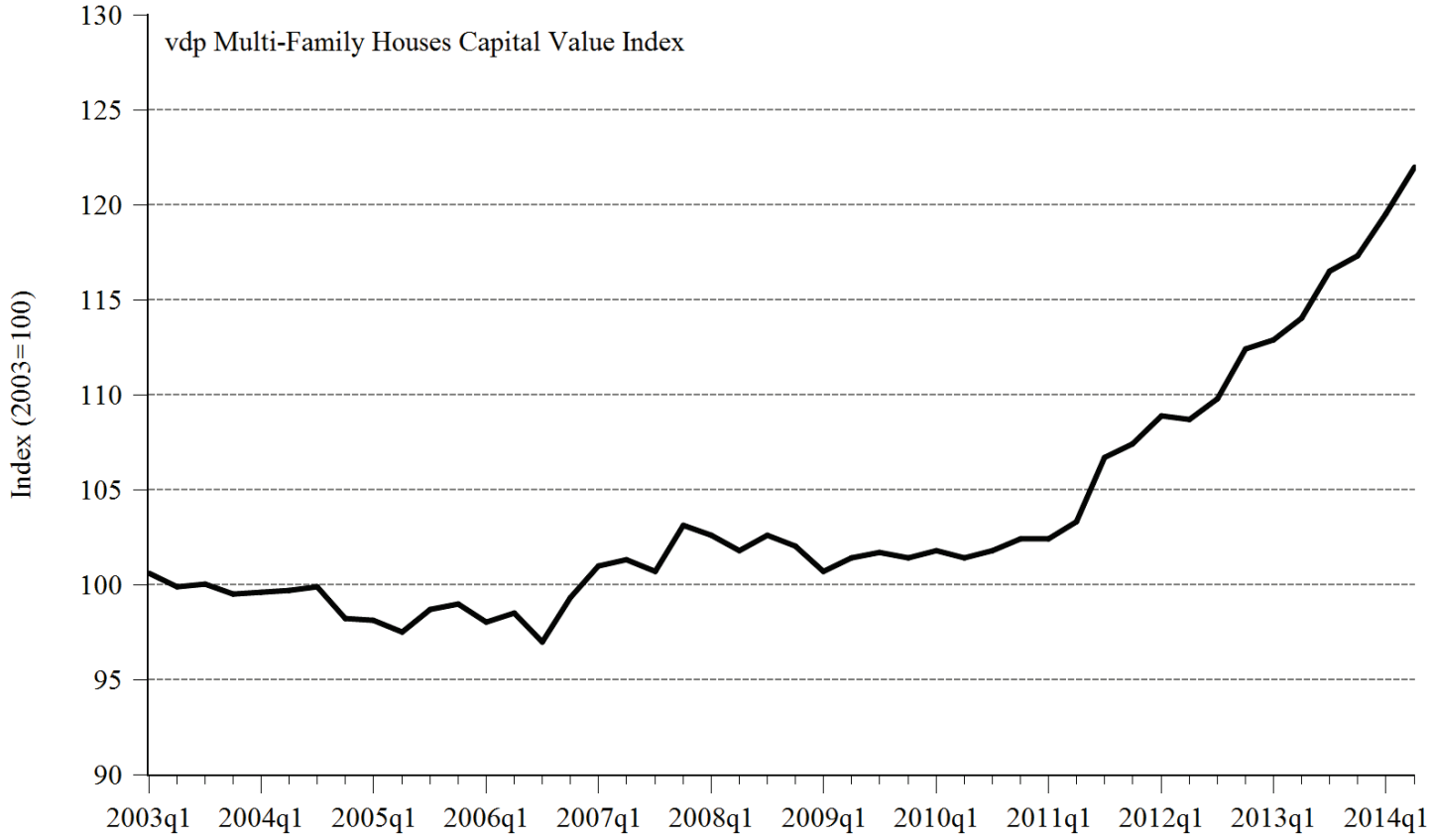
Results

Multi-Family Houses – Rent and Cap Rate Indices





Multi-Family Houses – Capital Value Index



Index Development by Property Type

Current Market Situation

- Multi-Family Houses
  - High rent increases in core cities (Conurbations, Metropolitan Areas).
  - Core cities are characterized by shortage of supply. Thus, the price increases are a result of a competitive market.
  - Demand is concentrated on existing housing stock. Extrusion of demand for cheaper living space.
  - Construction activity is growing slowly but still on a low level. Especially, core cities are affected, because they are in need for multi-family houses.
- Office
  - Due to good economic conditions, demand for office space will increase further in 2014.
  - Construction activity rises slightly. Vacancy rates are declining.
  - High demand for core properties in the Top 5 led to further yield compression on office properties. Stable outlook for prime and average rents in German office markets.
- Retail
  - Sales space will expand up to six million sq m by the end of 2020.
  - Still growing demand for sales floor space from international chains. Especially in prime locations in Metropolitan areas.
  - Rents in prime locations tend to rise further. Rents in secondary locations are under pressure due to structural changes in consumer demand. As a result of the strong demand for core product prime yields are declining.

Summary / Outlook

- The quarterly vdp price indices for residential and commercial real estate are covering more than 90 % of the German real estate market activity.
- Due to over 200 new banks that are now contributing to the transactions database, the representativeness of the results will be further increasing.
- We expect more participating banks in 2015.
- All vdp Indices are published six weeks after previous quarter.

vdpResearch

vdpResearch GmbH
Georgenstraße 21
10117 Berlin
Deutschland
Tel: +49(0)30 20622917
kunert@vdpresearch.de

www.vdpResearch.de