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FIG Working Week 2015
From the wisdom of the ages to the challenges of modern world

REAL ESTATE REFERENCE VALUES FOR A BETTER MARKET TRANSPARENCY

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Sofia, Bulgaria May 18th 2015

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Motivation

Source: abendzeitung-muenchen.de

Rent index Munich 2011

- simple quality
- medium quality
- good quality
- very good quality
- other

Source: www.geoportatpraha.cz

Source: http://www.realtor.com

Source: http://blog.property.com.my

Source: http://www.gas.niedersachsen.de

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Motivation

“real estate valuation”

value of the land

value of the building

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Real estate reference values

Real estate reference values in the city of Düsseldorf (Germany)

Abmelden

Werkzeuge

Maßstab wählen
DTK 1:10000

Optionale Folien
 Gemeindegrenzen
Immobilienrichtwerte Jahrgang:
2015


Lage und Wert	
Gemeinde	Düsseldorf
Ortsteil	Gerresheim
Name	Gräulinger Straße
Immobilienrichtwertnummer	117790
Immobilienrichtwert	**** C/m² (im kostenpflichtigen Download enthalten)
Stichtag des Immobilienrichtwertes	01.01.2015
Teilmarkt	Eigentumswohnungen
Beschreibende Merkmale: Gebäude	
Baujahr	2000
Wohnfläche	60-120 m ²
Ausstattungs-kategorie	mittel
Modernisierungstyp	neuzeitig (voll modernisierter Altbau)
Keller	vorhanden
Dachgeschoss	ausgebaut
Beschreibende Merkmale: Grundstück	
Beitragsrechtlicher Zustand	ebfrei nach BaUGB und kanalanschlussbeitragsfrei nach KAG
Sonstige Hinweise	
Mietsituation	unvermietet

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Study area – Rhine-Sieg district



- 8 municipalities and 11 cities
- area: 1.153 sq. km
- ~ 580.000 inhabitants
- rural and urban areas
- strong fluctuating population density
- ~ 5.900 comparable prices for the submarket of *condominiums*

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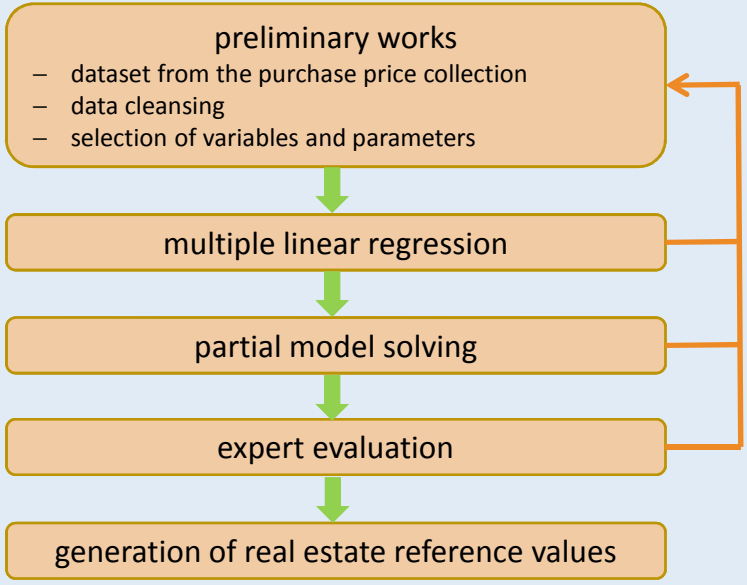
Source: Rhine-Sieg-Kreis

Legend: Municipalities (light blue), Cities (yellow)

Can real estate reference values be generated for the (whole) study area?

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Operational steps



```

graph TD
    A[preliminary works  
- dataset from the purchase price collection  
- data cleansing  
- selection of variables and parameters] --> B[multiple linear regression]
    B --> C[partial model solving]
    C --> D[expert evaluation]
    D --> E[generation of real estate reference values]
    B -- (iterative) --> A
    C -- (iterative) --> A
    D -- (iterative) --> A
  
```

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Variables	Description	Coding
Regional location	The Rhine-Sieg district consists of 19 municipalities. To verify the influence of the specific municipality each of them will be represented by a variable.	Dummy-variables for each municipal
Small-scale location	To distinguish different qualities of location between the municipalities.	Dummy-coding in 4 groups: - excellent - good - normal - moderate
Date of sale	To consider the economic development during the investigation period.	Dummy-variables for each Year (2009 – 2013)
Living area	Number of m ² of the condominiums.	Dummy-coding in 3 groups: - 0 – 40 m ² - 41 – 90 m ² - > 90 m ²
Age/Modernization	To describe the influence of the age and condition.	2 third-degree polynomials: - age < 15 or modernized within the last 15 years - age > 15 and <u>no</u> modernizations within the last 15 years
Floor	To describe the influence of the floor the condominiums are located at	Dummy-coding in 4 groups: - basement/ground floor - 1st - 4th floor - > 4th floor - attic floor
Number of floors	Describes the number of floors of the building the condominium belongs to.	Dummy-coding in 2 groups: - 1 – 7 floors - > 7 floors

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Variables	Characteristics	Regression coefficients
Absolute term (constant)		2,816.350**
Regional Location (19 municipalities)	Königswinter (norm)	0
	Siegburg	-84.755**
	Sankt Augustin	-280.595**
	Troisdorf	-366.888**
	And others...
Small-scale Location	excellent	357.835**
	good	157.946**
	normal (norm)	0
	moderate	-154.315**
Date of Purchase	2009	-315.128**
	2010	-206.284**
	2011	-121.164**
	2012	-116.705**
	2013 (norm)	0
Living Space	0 – 40 m ²	-9.021*
	41 – 90 m ² (norm)	0
	> 90 m ²	58.782**
Age/Modernization (Polynomials)	age < 15/modernized; 3 rd degree	-0.011**
	age < 15/modernized; 2 nd degree	1.780**
	age < 15/modernized; 1 st degree	-81.593**
	no modernizations 3 rd degree	-0.008**
	no modernizations 2 nd degree	1.397**
Floor	no modernizations 1 st degree	-74.643**
	basement/ground floor	-51.492**
	1 st – 4 th floor (norm)	0
	> 4 th floor	-13.656*
	attic floor	86.560**
Number of floors	1 – 7 floors (norm)	0
	> 7 floors	-459.584**
*p < 0,05 **p < 0,01		

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- regression coefficients
→ adjustment factors
- validation of the adjustment factors

Small scale location class	Number of purchase prices	Adjustment factors
1 – excellent	57	1,20
2 – good	1.113	1,09
3 – normal	1.481	1,00
4 – moderate	241	0,91

purchase prices

location 1 age 25 years living area > 90 m²

location 3 age 35 years living area 41-90 m²

location 1 age 15 years living area > 90 m²

location 2 age 10 years living area 0-40 m²

standard/norm: location 1 age 20 years living area > 90 m²

case no.

- all comparable prices can be normalized

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- review and evaluation by experts
- instruments: online-surveys, interviews, group discussion
- if necessary: re-fitting of the regression model and restart

Modell	Nicht standardisierte Koeffizienten		Standardisierte Koeffizienten		
	B	Standardfehler	Beta	t	Sig.
1 (Konstante)	127.719	2.922		45,262	,000
HQ100	-8,398	2,706	-,049	-3,104	,002
Fläche [m2]	-,015	,005	-,059	-3,334	,001
Erschließungszustand	-22,747	3,148	-,116	-7,226	,000
Sanierungsgebiet	18,187	5,180	,066	3,511	,000
Wohnlage - sehr gut	72,548	4,793	,240	15,137	,000
Wohnlage - gut	27,526	1,507	,305	18,262	,000
Wohnlage - einfach	-27,944	3,990	-,135	-7,184	,000
Wohnlage - dörflich	-7,738	2,773			
Typ_DHH	8,758	2,542			
Typ_Reihenendhaus	45,355	7,018			
Typ_Reihenhaus	63,610	7,949			
2009	7,748	2,637			
2010	11,209	2,403			
2011	20,563	2,372			
2012	24,133	2,823			
2013	34,155	2,747			
2014	33,476	3,033			

Source: SPSS Source: Colourbox Source: <http://fm4.orf.at/stories/1670770/>

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Generation of reference values

- generation of reference zones
- grouping of comparable prices
- definition of (fictional) reference properties

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- adjustment of the selected comparable prices (normalization)
- real estate reference value by averaging

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Results

City of St. Augustin

Municipality of Swisttal

Adjustment

➤ **number of comparable prices is essential**

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Summary

- real estate reference values could be generated (with limitations) for the study area
- no “black box” method
- fine-tuning and evaluation by experts

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Should you try to generate real estate reference values?

#1 areas with a high number of comparable prices
→ generation of real estate reference values is recommendable

#2 areas with a small number of comparable prices
→ cost-benefit assessment / feasibility

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Thank you for your attention!

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WORKING WEEK 15
27-31 MAY SOFIA BULGARIA 2015