

The Industrial Real Estate Market in Krakow

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Key words: cracovian real estate market, industrial properties, rental rates, capitalization rates, discount rates.

SUMMARY

Determining the non market value of the industrial properties, using the income approach, but also appraising the market value, in comparative approach, the essential part of valuation work is the analysis of real estate market in the range of unit rental rates due to rent or lease various kinds of surfaces depending from type of valuated properties, but also in the reference to the loss due to not rented surfaces of the buildings and arrears in rent gaining, operating expenses, but most of all the return rates and the risks related to investing in particular type of the property. The article presents the analysis of real estate market in Krakow in the aspect of afore-named economical factors.

Określając wartość nierynkową nieruchomości przemysłowych, przy wykorzystaniu podejścia dochodowego ale również przy wycenie wartości rynkowej w podejściu porównawczym, istotną częścią czynności szacowania jest analiza rynku nieruchomości w zakresie kształtowania się stawek czynszu najmu bądź dzierżawy za poszczególne powierzchnie budynków i budowli, strat z tytułu nie wynajęcia powierzchni i zaległości w pozyskiwaniu czynszu, wydatków operacyjnych a przede wszystkim stóp zwrotu oraz ryzyka związanego z inwestowaniem w dany typ nieruchomości. W artykule zaprezentowano analizę rynku nieruchomości w Krakowie w aspekcie powyższych parametrów ekonomicznych.

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1. INTRODUCTION

The purpose of this work is discussion and presentation the industrial real estate market's character in Krakow in relation to information, which are used in the valuation process. The analysis include the following data: the level of unit rents due to warehouse and productive area, the unit offered prices of industrial un-built properties and lease unit rates of that kind of land, the level of capitalization and discount rates achieved in the filed of industrial's real estate investment. This work contains also the market analysis in relation to factors that have influence on the value of above-mentioned parameters, where we can include among others the communication infrastructure and local site development plan.

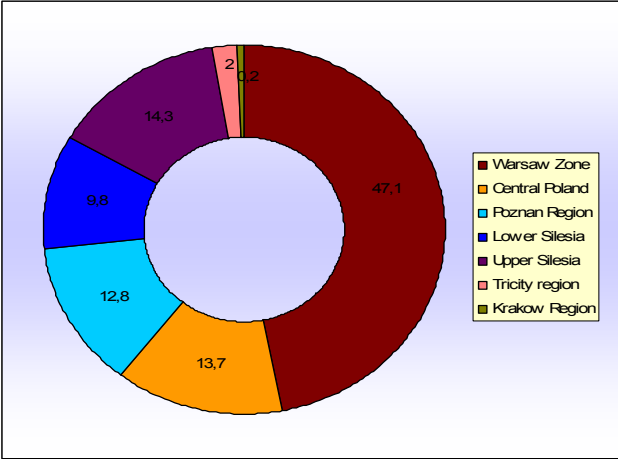
Krakow, is situated in the middle-south part of Poland, around 200 km from Slovakia borders. The city is the capital of malopolska region and is the centre of cultural and scientific life. It is on the second place in the country in respect of the number of residents, which is 756 441 and the area that equals 326,8 km². Krakow is divided in to 4 administrative districts: Krowdrza, Podgorze, Srodmiescie and Nowa Huta. The trump of the city is good transport connection with Slovakia and Czech Republic and it's localization near the Slask territory, which is one of the most developed regions in Poland in respect of the supply of warehouse area and the number of industrial properties.

Krakow is important road junction that connect south-west part of Poland and Slask territory with it's east parts and south neighbors like Czech Republic and Slovakia. There are passing national roads through the city: of the Gdansk-Chyzne and Zgorzelec-Przemysl relations, and from south: A4 highway of Wroclaw-Rzeszow relation. Krakow has also well developed railway network, that enables access to all parts of the country and also foreign cities. Next to road and railway infrastructure, the city has also International Airport Balice, situated 11 km on the west from the city centre.

Significant role during investment decision-making, including new warehouse and productive area building, play the settlements of local site development plan. This document as an act of local law, forms the way of performing the land's ownership rights, through the indication of the use and the land development conditions. Local plans determine therefore the location of particular types of investments in the city's area. At the beginning of 2009, the valid land development plans were covering the 4 554 hectares, whereas the drafting plans were relating to 12 856 hectares area, what is accordingly 14 % and 39 % of total city's area. On the areas that don't have current local plans, the investors are obliged to reply for decision of zoning regulations, which sets the basic conditions according to the land use, the type of possible building to realize on this plot but also the geometrical and technical parameters relating to particular investment. The insufficient number of valid local plans and long period of waiting

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time for decision of zoning regulations, which at present takes even one year, are the significant barrier for new planning investments projects. According to data collected by the City Hall of Krakow, in 2007 there were given 83 planning permissions for industrial buildings, what is smaller number comparing to 2006, when there were given 113 decisions, but the number of building permits grew almost six times from 13 in 2006 to 87 in 2007. Krakow, comparing to other cities and parts of the country, doesn't belong to the lead of industrial regions. The most developed industrial real estate markets and logistic centers in Poland are Warsaw, Upper and Lower Silesia, Central Poland and the Tricity region. Applying to data collected by DTZ Research company, at the end of 2008 the total area of modern warehouse space in Poland were 4.2 mln m², which is 14% growth in relation to the year before.



Picture 1. The percentage share of top cities in industrial real estate resources
The source: DTZ Research

As the above placed diagram shows, Krakow is at the end of top cities in respect of share (0,2%) in industrial space resources, especially warehouse type. Annual supply for warehouse spaces in particular years is presented below.

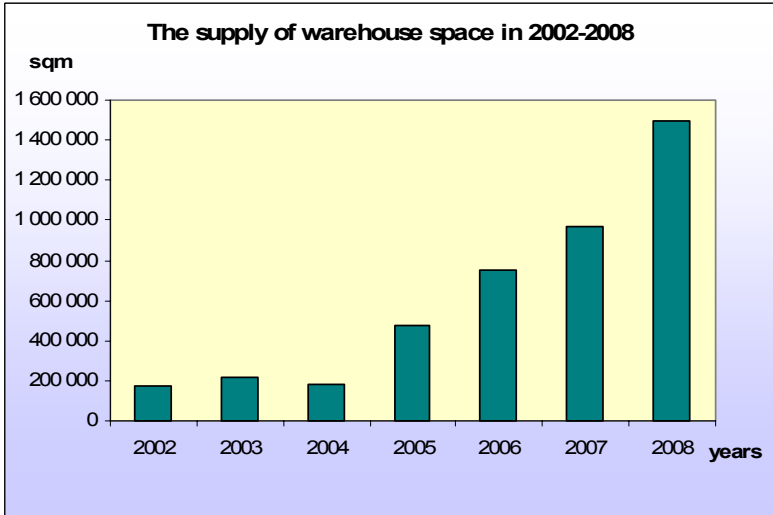


Figure 1. The supply of warehouse space in Poland in 2002-2008
The source: DTZ Research

In Krakow the biggest interest among investors, in relation to industrial properties, is faced to Podgorze and Nowa Huta districts, which have the greatest resources of industrial space. On these lands are located most of warehouse and productive buildings, although these are mostly older structures, not used to current investor's requirements. The Srodmiescie district, because of its building character, location in the city centre with worse road access, doesn't constitute the industrial investment area. Similarly is with Krowdrza district, that has small number of industrial structures. The last two of mentioned districts have a big resource of commercial premises.

2. THE MARKET RESEARCH IN RELATION TO RENTAL RATES OF WAREHOUSES AND PRODUCTION SPACES

The subject of the research is the industrial real estate market in the range of unit rents level of warehouse and productive spaces, located on the area of two districts: Nowa Huta and Podgorze. On the map of Krakow, which is presented below, there are marked the regions with the highest investment of analyzed property market: Nowa Huta, situated in north-east part of the city, Balice, located in west part of Krakow and two regions in Podgorze district: Rybitwy, located in south-east part and the region near the A4 highway.



Picture 2. The location of industrial investments in Krakow
The source: own work, www.mapy.google.pl

2.1. Nowa Huta

The most popular among the investors on analyzed area of real estate market, are the lands situated along main exit roads from the city like Igolomska, going in east direction, regions like: Czyzyny, Leg, Biencyce and Mistrzejowice, which have good communication and ability of road access for heavy wheeled-vehicles. The warehouses and production halls, that are offered for rent, are the objects with area from 300 to 1 600 m², whereby there are mostly

structures with area from 600 to 1000 m². Most of offered properties have office facilities, staff rooms, parking places, boarding ramps and vehicle manoeuvre areas. These are usually buildings that have dozen or even several dozen years, however in face of high demand for that type of spaces, there are also structures built in the last years or “built-to-suit” – developed and arranged for particular investor’s requirements. The height of buildings is between 4-8 m, with the prevailing height of 6,5 m.

To bring closer the character of warehouse and production spaces market rents, in Nowa Huta district, there was collected the data base of 18 properties, presented in table 1, that were offered for rent. Each property was described by attributes like: rented *usable area*, technical infrastructure facilities equipment – *utilities*, *road access*, *property’s technical condition* and *variety of built-up and the presence of additional facilities*. Each attribute was described using three gradual scale in the following way:

The usable area – described in m²;

Utilities (the number of available utilities in the building) – the electrical power supply, water-pipe network, sewerage system (1); the electrical power supply, water-pipe network, sewerage system, heating (2); the electrical power supply, water-pipe network, sewerage system, heating, air-conditioning or building protection (3);

Road access (the distance from main roads, the city’s borders, the location in areas with difficult transportation, time needed to get to main city’s exit roads) – location in Mistrzejowice and Czyzyny region (1); Bieczyce, Nowohucka, Makuszynskiego (2), Igolomska (3);

The technical building condition (building year, conducted repairs, the type of building material) – average (1); good (2); very good(3);

The variety of built-up (additional office space, staff rooms, boarding ramps, vehicle manoeuvre areas, parking places, fencings) – adverse (1); average (2); good (3).

Table no.1 Commercial premises – exemplary of lease offers in Nowa Huta district.

Ip	Location	Usable area [m ²]	Utilities	Road access	The technical building conditions	Variety of built-up	Net unit rent [‡] [€/m ²]
1	Nowohucka	275	2	2	2	2	4,3
2	Makuszynskiego	415	3	2	3	3	4,6
3	Bieczyce	450	3	2	2	2	5,4
4	Broniewskiego	500	2	2	2	2	3,9
5	Makuszynskiego	500	2	2	3	3	6,0
6	Czyzyny	570	2	1	2	3	3,6
7	Pysocice	600	3	2	2	2	3,2
8	Mistrzejowice	800	2	1	2	2	4,3

[‡] According to rate of exchange from 14.02.2009, Euro=4,64 PLN

9	Makuszynskiego	830	2	2	3	2	4,7
10	Bienczyce	830	1	2	3	1	4,3
11	Bienczyce	830	1	2	3	1	4,1
12	Bienczyce	830	3	2	2	2	6,0
13	Igolomska	910	2	3	2	1	3,2
14	Igolomska	1 000	1	3	2	2	4,3
15	Bienczyce	1 072	3	2	3	3	4,7
16	Bienczyce	1 100	3	2	2	3	4,3
17	Bienczyce	1 130	2	2	2	1	4,1
18	Igolomska	1 590	3	3	3	3	5,0

The source: own work.

Based on the data, presented above, about 18 properties offered for rent, we can draw the following conclusions:

-The average net unit rate is:

$$\hat{c}_{av} = 4,5 \text{ Euro} / m^2$$

-The standard deviation for unit rents, which is the measure of the mean dispersion regard to the average net unit rate, equals:

$$\sigma_n = 0,77 \text{ Euro} / m^2$$

-The mean net unit rent's standard deviation, which is the measure of inaccuracy in appraising the average net unit rate, is:

$$\sigma(\hat{c}_{av}) = 0,19 \text{ Euro} / m^2$$

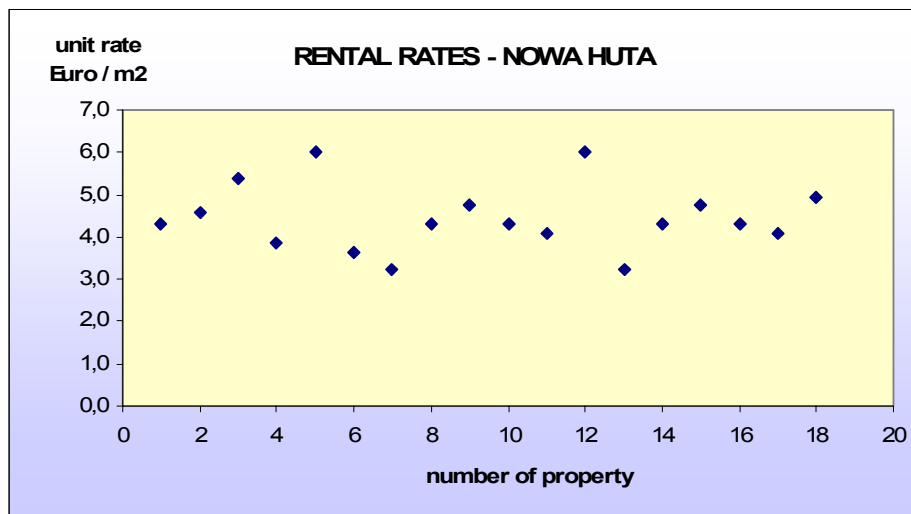


Figure 2. The dispersion of unit rents in Nowa Huta district.

The source: own work.

In relation to values attributed to particular characteristics of each property from the table 1, there were calculated the Pearson correlation coefficients r , describing the correlation level each of attribute with net unit rates in Nowa Huta district, and their importance values k_j . The results are presented in table 2.

Table no.2 The Pearson correlation coefficients and attribute's importance values – Nowa Huta.

	Usable area	Utilities	Road access	The technical building conditions	Variety of built-up
r	0,0063	0,2740	0,0145	0,3358	0,3528
r^2	0,0000	0,0751	0,0002	0,1127	0,1244
k_j	-	24%	-	36%	40%

The source: own work.

Table 2 shows, that the *usable area* and *road access* don't explain the unit rates variability, the rest of attributes have an influence on the level of net unit rates as following: *utilities* 24%, *the technical building condition* 36% and *the variety of built-up* 40%. The lack of road access impact on the unit rates variability may has a source in fact, that areas where are concentrated industrial investment, are located in close distance from each other, near or by the main exit roads from the city, so the quality of transport in these regions isn't as differential to has an important influence on the level of unit rates.

2.2. Podgorze

In this district, the main area of industrial investment is Rybitwy, region where is the major part of warehouse and production structures, situated near the city's exit road in south-east direction and the A4 ring road. Next we can mentioned the Zakopianska region and the south-west part of Podgorze district. However they have smaller part in that real estate market area. To present the net unit rent's level of industrial spaces on the analyzed properties market, there were collected data about 26 properties, which were described by attributes as it shows the table 3.

The attributes with their numeral and descriptive scale are related to characteristics that were presented in the previous point applying to warehouse spaces research in Nowa Huta. Because of different values of *road access* attribute, which depends on location the property in particular district, the description of this characteristic is showed below.

Road access (the distance from main roads, the city's borders, the location in areas with difficult transportation, time needed to get to main city's exit roads) – in greater distance from main city's exit roads (1); Nowohucka, Rybitwy, Wadowicka region (2); location near the A4 ring road, Skotniki, Poolanki (3);

Table no.3 Commercial premises – exemplary of lease offers in Podgórze district.

lp	Location	Usable area [m ²]	Utilities	Road access	The technical building conditions	Variety of built-up	Net unit rent [§] [€/m ²]
1	Nowohucka	200	1	2	1	1	3,2
2	Klimeckiego	200	1	2	1	1	3,2
3	Zablocie	220	2	2	2	1	4,3
4	Skotniki	259	2	3	3	2	5,4
5	Rybitwy	285	2	2	2	1	4,5
6	Rybitwy	324	1	2	1	2	3,0
7	Tischnera	339	1	3	1	1	4,5
8	Rybitwy	440	2	2	2	3	6,7
9	Nowohucka	460	1	2	2	2	4,3
10	Wielicka	532	3	3	3	3	6,9
11	Nowohucka	550	2	2	2	1	4,3
12	Rybitwy	650	2	2	2	2	5,2
13	Saska	700	2	2	2	1	4,3
14	Rybitwy	800	1	2	1	2	3,0
15	Rybitwy	830	3	2	3	3	6,7
16	Rybitwy	930	3	2	2	2	4,5
17	Rybitwy	1 100	2	3	2	1	3,0
18	Rybitwy	1 123	1	3	1	2	3,0
19	Wielicka	1 590	3	3	3	3	5,0
20	Wadowicka	1 600	3	2	3	3	6,0
21	Lagiewniki	1750	3	3	3	2	4,9
22	Rybitwy	2 100	2	2	2	2	4,3
23	Rybitwy	2 500	2	2	3	3	3,2
24	Rybitwy	2 600	2	2	2	2	3,9
25	Rybitwy	2 700	3	3	2	2	4,3
26	Rybitwy	7 700	3	2	3	3	4,1

The source: own work.

The data about 26 properties show the big variety in the area of space offered for rent which is from 200 to 7 700 m². The major group are the properties with area from 500 to 1 600 m². Based on the data, presented above, about 26 properties offered for rent, we can draw the following conclusions:

-The average net unit rate is:

$$\hat{c}_{av} = 4,5 \text{ Euro} / m^2$$

-The standard deviation for unit rents, which is the measure of the mean dispersion regard to the average net unit rate, equals:

$$\sigma_n = 1,14 \text{ Euro} / m^2$$

[§] According to rate of exchange from 14.02.2009, Euro=4,64 PLN

-The mean net unit rent's standard deviation, which is the measure of inaccuracy in appraising the average net unit rate, is:

$$\sigma(\hat{c}_{av}) = 0,23 \text{ Euro} / m^2$$

The Podgorze district characterizes the higher dispersion of net unit rates in comparison to Nowa Huta. The unit rates are from 3 to 6,7 Euro/ m², what is showed on diagram 3.

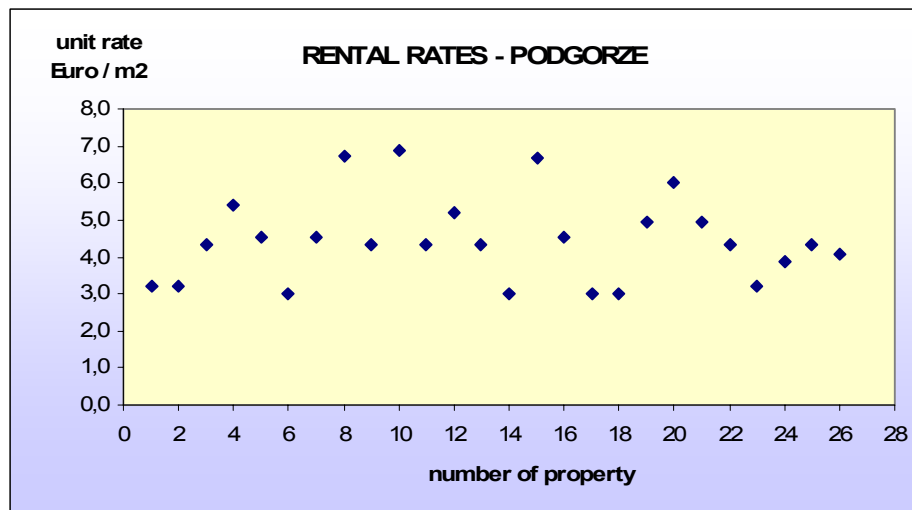


Figure 3. The dispersion of unit rents in Podgorze district.
The source: own work.

In relation to values attributed to particular characteristics of each property from the table 2, there were calculated the Pearson correlation coefficients r , describing the correlation level each of attribute with net unit rates in Podgorze district, and their importance values k_j . The results are presented in table 4.

Table no.4 The Pearson correlation coefficients and attribute's importance values – Podgorze.

	Usable area	Utilities	Road access	The technical building conditions	Variety of built-up
r	-0,1044	0,6057	0,0992	0,6128	0,5164
r²	0,0109	0,3669	0,0098	0,3755	0,2667
k_j	-	36%	-	37%	26%

The source: own work.

Table 4 shows, that the *usable area* and *road access*, alike Nowa Huta, don't explain the unit rates variability, the rest of attributes have an influence on the level of net unit rates as following: *utilities* 36%, *the technical building condition* 37% and *the variety of built-up* 26%.

3. THE UNDEVELOPED LAND PROPERTIES MARKET RESEARCH

In the range of industrial real estate market, the research contain undeveloped land properties market that are designed for industrial built-up in relation to their unit offered prices. The research is related to Nowa Huta and Podgorze districts.

There were collected data base about 8 properties located in Nowa Huta, presented in table 5 and about 10 properties from Podgorze, showed in table 7. Each of them was described by attributes like: *plot's area*, the *plot's shape*, technical infrastructure facilities equipment – *utilities* and *road access*. The values of particular characteristics in numerical scale are:

The plot's area – described in m²;

The plot's shape – good (3): regular, rectangular or square shape, with low value relation the plot's width to it's length; average (2): regular, trapezium shape, overlong rectangular; adverse (1): irregular.

Utilities – full infrastructure (3): all infrastructure facilities are available; partial infrastructure (2): some infrastructure facilities are on the plot and some are available in the range of neighboring lands; lack of infrastructure (1): no utilities on the plot and in it's range.

3.1 Nowa Huta

The *road access* attribute for industrial properties located in Nowa Huta district is described in the following scale:

Road access: - location in Igolomska region, on the area of Technology Park (3); Nowa Huta Leg and Biencyce area (2); lands with difficult road access or with easement of access (1).

Table no.5 Industrial undeveloped land properties – Nowa Huta.

lp	Location	Area [m ²]	The plot's shape	Utilities	Road access	Offered unit price [€/m ²]
1	Łęg	745	2	1	2	78,0
2	Łęg	2 726	1	2	2	98,8
3	Łęg	3 000	2	2	2	107,8
4	Biencyce	3 000	2	2	2	64,7
5	Łęg	3 041	3	1	2	106,3
6	Łęg	6 400	2	1	2	76,6
7	Park Technologiczny	12 000	3	3	3	90,8
8	Park Technologiczny	12 042	3	3	3	90,5

The source: own work.

Based on the collected data base there were calculated the following parameters:

-The average offered unit price of land is:

$$\hat{c}_{av} = 89,2 \text{ Euro} / m^2$$

- The standard deviation for offered unit prices, which is the measure of the mean dispersion regard to the average offered unit price, equals:

$$\sigma_n = 14,23 \text{ Euro} / m^2$$

- The mean offered unit price's standard deviation, which is the measure of inaccuracy in appraising the average offered unit price, is:

$$\sigma(\hat{c}_{av}) = 5,38 \text{ Euro} / m^2$$

The Pearson correlation coefficients r , describing the correlation level each of attribute with offered unit prices and their importance values k_j , are presented in table 6.

The Pearson correlation coefficients and attribute's importance values for industrial lands – Nowa Huta.

	Area	The plot's shape	Utilities	Road access
r	0,0156	0,1388	0,1081	0,0603
r²	0,0002	0,0193	0,0117	0,0036
k_j	-	56%	34%	10%

Table no.6

The source: own work.

Table 6 shows, that the biggest impact on the offered unit prices of industrial lands has *the plot's shape* (56%). Lower influence have attributes: *utilities* (34%) and *road access* (10%). The zero value of importance for *the area* attribute shows no correlation with offered price.

3.2 Podgórze

Next part of research is related to industrial undeveloped lands located in Podgorze district. The properties are described by the same attributes as the properties located in Nowa Huta. Refer to road access attribute the following scale is applying:

Road access – location near A4 ring road (3); Rybitwy and Wielicka region (2); lands with difficult road access or with easement of access (1).

Table no.7 Industrial undeveloped land properties – Podgorze.

lp	Lokalizacja	Area [m ²]	The plot's shape	Utilities	Road access	Offered unit price [€/m ²]
1	Rybitwy	2 000	3	3	2	64,7
2	Wezel Tyniecki	3 300	2	3	3	107,8
3	Rybitwy	5 500	1	3	2	43,9
4	Rybitwy	6 400	2	3	2	40,9
5	ok. Zakopianki	9 100	2	2	2	75,4
6	Mogilany	15800	2	1	3	40,9

lp	Lokalizacja	Area [m ²]	The plot's shape	Utilities	Road access	Offered unit price [€/m ²]
7	Rybitwy	20 000	2	2	1	52,8
8	Rybitwy, Bolewa	23 142	2	3	2	48,9
9	Rybitwy	31 000	2	3	2	69,6
10	Mateczne	9660	2	3	2	53,1

The source: own work.

Based on the collected data base there were calculated the following parameters:

-The average offered unit price of land is:

$$\hat{c}_{av} = 59,80 \text{ Euro} / m^2$$

-The standard deviation for offered unit prices, which is the measure of the mean dispersion regard to the average offered unit price, equals:

$$\sigma_n = 19,60 \text{ Euro} / m^2$$

-The mean offered unit price's standard deviation, which is the measure of inaccuracy in appraising the average offered unit price, is:

$$\sigma(\hat{c}_{av}) = 6,53 \text{ Euro} / m^2$$

The Pearson correlation coefficients r , describing the correlation level each of attribute with offered unit prices and their importance values k_j , are presented in table 8.

Table no.8

The Pearson correlation coefficients and attribute's importance values for industrial lands – Podgorze.

	Area	The plot's shape	Utilities	Road access
r	-0,1964	0,2369	0,2240	0,3418
r²	0,0386	0,0561	0,0502	0,1168
k_j	15%	21%	19%	45%

The source: own work.

From the data present above we can assume that the highest influence on the offered prices of industrial lands has *road access* attribute (45%)., next will be *the plot's shape* (21%), *utilities* (19%) and *the area* (15%).

3.3 The capitalization and discount rates for analyzed real estate market

The presented market research is related to unit rates of industrial spaces and offered unit prices in relation to industrial undeveloped lands. It is noticed small amount sales offers of warehouse and production structures as well as lands lease. The average unit prices are:

- Nowa Huta: 646,6 Euro / m²

- Podgórze: 754,3 Euro / m²

The data showed above and calculated in further part of this work the values of average net unit rates which were:

- Nowa Huta: 4,5 Euro / m²

- Podgórze: 4,5 Euro / m²

allows conclude, that the mean capitalization rates R_k and discount rates r_D are:

- Nowa Huta: $R_k = 0,08$ $r_D = 0,09$

- Podgórze: $R_k = 0,07$ $r_D = 0,08$

4. THE MODERN WAREHOUSE SPACES IN KRAKOW

Krakow is getting an interesting city for investors in the range of logistic centers. It is noticed high demand for that kind of spaces with the contemporary low supply of modern warehouse structures and industrial lands. According to data of Suchman & Wakiefield company, the demand of warehouse spaces in 2006-2007 was constant and equaled 18 400 m² where the vacancy rate was 2,7%. The modern and large warehouse spaces are available on the Technology Park area, who was formed in 1997. It is one of six currently running in Poland, whose purpose is creating suitable economic and organizational conditions for local and foreign investors, through tax allowances and access to educated academic staff and qualified experts. The Cracovian Technology Park, being a special economic zone, contains nine sub-zones, whose total area equals about 300 hectares, including around 87 hectares on Krakow territory. The basic purpose is development of advanced technology industry's sector, especially electronics, information technology, telecommunications etc. On the Nowa Huta's region, in Branice sub-zone, there are offered land for industrial plants development. The Czyzyny region, situated in the east part of the city, is reserved for scientific-research and office buildings, considering urban built-up nature. A status of the special economic zone has also the office building in Bronowice, that's why investors can count on public help. The last element, assigned to Cracovian Technology Park, located in the city borders, is Pychowice area, which is situated in south-west part of Krakow. This region is planned for realization of modern industrial production buildings and services.

It is worth to mentioned about two logistic centers that are located in Krakow, built by the leading developer on this region the "Biuro Inwestycji Kapitalowych". First center was realized in 2000, it's situated in Podgorze district, on Rybitwy area, whose total warehouse space is 8 000 sqm and office 2000 sqm, where the minimum of offered space for rent is 1000 sqm. The second logistic center is located also on Rybitwy area, 1,5 km from east side of the city's ring road. The total warehouse area offered for rent is 11 000 sqm, where the minimum space for rent is 900 sqm. The last of that kind of investment is Cracow Airport Logistic Center, which is building by the Goodman company, on the plot of 31,5 ha in Modlniczka. It's located by the city's exit road in to Slask direction, 4 km from Balice airport and 1 km from the A4 highway. The company has plans for building modern warehouse spaces, "A" class, with 150 000 sqm of total area.

5. CONCLUSIONS

Krakow, though it isn't one of the cities in the range of total industrial space for rent, becomes more attractive city for investors, especially in the aspect of logistic centers. Nowadays most of rented warehouse and production buildings have small usable areas and don't conform investors expectations. The mean unit rates are 4,5 Euro/sqm, the average capitalization rates are on the level 0,07-0,08 and discount rates equals 0,08-0,09. It is worth to pay attentions for new logistic centers that offer bigger warehouse spaces, with high quality and new realizing logistic center in Modlniczka, which will have 150 000 m² of modern and attractive located warehouse space in offer.

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