The Cost of Zoning Restrictions: Property Prices in Europe

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Abstract

Zoning matters. The influence of zoning on working and shaping of cities is more than clear. The amount of land which is available for housing, as well as the ease with which the planning permits are granted, influences the property prices. That is why zoning needs to be done well, and to a reasonable extent. Yet, this paper finds evidence that the economic impacts of urban planning are not sufficiently considered in the majority of national urban policies. To take into account the size of the impact, we should consider that the average European household spends 20% of their budget on housing (OTB Research Institute 2010), with households in France spending 25.2% in 2008, and households in Cyprus 12.8%. The public policy is, as with any other democratically-managed area, slow in refining the right approach. This paper is a demonstration of the relationship between higher property prices and the restriction of housing supplies. To find evidence for a causal relationship between property prices and regulation, I compare industrial property prices (corrected for the level of GDP) with the restriction of supply of properties. The number of procedures necessary to obtain a construction permit is used as a benchmark for this restriction – I assume the number of procedures to be strongly indicative of wider restrictions.
The paper concludes that the correlation between prices and supply restriction is 0.3241, which is a moderately strong relation.

Key words: Property prices, land use regulation, zoning

JEL Classification: R52 – Land Use and Other Regulations

1 Introduction

This paper aims to highlight what is, in this author's opinion, the greatest failure of contemporary urban planning and zoning: the lack of consideration for the effect that restricting supply has on property prices. If, due to restrictive planning, an insufficient number of houses are built, the prices go up. In fact, they often do. This simple logic is, however, often not sufficiently considered in the creation of zoning plans. For example, the Review of European Planning Systems (Oxley et al., 2009), which compares zoning policies in the UK, Ireland, Germany, France and the Netherlands, states that "responding to demand is not a key objective of planning systems," and lists the compared countries according to their ability to respond to changes in demand. While it bodes comparatively well for Ireland and Spain, both the United Kingdom and the Netherlands are at the bottom. Another neglected objective is that urban development plans are created without sufficient economical reasoning for assigning land for individual purposes. To be clearer, urban planners simply divide land according to various functions or purposes, but it is understandably difficult to calculate the quantities needed. These quantities are often set

ineffectively, which translates into different prices of land for different functions. So, for instance, land prescribed for farming is often a fraction of price of residential land.

This problem seems to be most pronounced in Europe (Cheshire et al., 2008). The United States has an easier situation, as most of the states do not have the land specifically zoned for specialized functions. This is not the case in Europe. So, for example, if a company or a city sets to build a hospital, the land is not (bar exceptions) zoned for such a specialized function as health care, and it has to be bought on market price. The localization of property prices makes this much more market based, as the area for parks is also bought on market rates and maintained by local municipalities through money raised locally. This results in a much better allocation of resources, but also in much higher social disparities. Some areas simply cannot afford funding for functions other than residential and commerce lands, and the lack of amenities also result in lower property prices.

The European way has its weaknesses, too. The majority of European states collect property taxes centrally and distribute revenue equally, and while the local authorities have to provide a number of services for new buildings, there is rarely a corresponding increase in funding. It is no wonder, then, that there are strong pressures to resist any new developments. (Cheshire et al., 2008)

The zoning of land for a specific purpose, as well as other restrictions, then functions as an invisible tax. This "tax" is paid by owners of the areas which cannot be developed for the most profitable properties, as well as all others who pay higher prices for their properties due to restricted supply. This has been exhaustingly covered by the research of Edward Glaeser (see (Glaeser et al., 2005) and (Glaeser&Gyourko 2005), for a U.S. perspective), and Paul Cheshire (Cheshire et al., 2008, for a European perspective). They have followed the same methodology to calculate the "regulatory taxes" for individual cities in the U.S. and Europe. In Glaeser's terminology, the "zoning tax" is a ratio of the property price for which the property buyer has to pay extra due to zoning restrictions. So, for example, his research reports on a zoning tax of 53.1% of the value of properties in San Francisco (Glaeser et al., 2005) mostly due to restrictions on the minimum size of the plot of land – developers and other entities are not allowed to build as densely as they would wish, resulting in higher prices of properties. The corresponding values of the zoning tax were calculated for Los Angeles (33.9%), San Jose (46.9%), or Washington DC (21.9%). Other cities, especially in the lightly-regulated Southeast, this zoning tax is almost zero – Houston, Tampa and Birmingham are excellent illustrations.

Cheshire's approach is the same (after all, he replicated Glaeser's research for British and European cities). He, however, refers to the tax as "regulatory tax." As expected, the rates are much higher in Europe, and even higher still in the UK than in the United States. This is, of course, mainly a result of height restrictions (very strict in London, and in other European cities). Prices of properties in London's West End are estimated to be eight times higher than they would be if these restrictions were not in place (Cheshire 2008). The same applies for London city (5.88 times), Frankfurt (5.37 times), Paris (4.05 times), and Amsterdam (3.02 times). On the other hand, in the case of Brussels with its light restrictions on urban sprawl, the price increase is only 1.68 times, a small number in the European context.

If developers were allowed to build upwards, the prices of properties in many European cities would go down, but a lot of current properties would be destroyed. At the same time, if buyers were more aware that they pay up to eight times more than what would be possible without the restrictions, the pressure to change the policy might be stronger.

To mention other research on this subject, another interesting approach was made by Henneberry et al (2003), who using cross-sectional analysis calculated proportional relationship (elasticity) between planning regime and local business activity for municipalities in the UK. Findings of the paper was an elasticity of 15.5% in the office sector and 38% in the industrial sector.

And yet another theoretical attempt to quantify the cost of the restrictions was made by Alain Bertaud and Jan K. Brueckner (2004), who using a standard mono-centric model estimated welfare cost of building-height restrictions (FAR) in Bangalore. Their research suggests that these restrictions only are responsible for 3-6% of household consumption.

This paper sets to measure the relation between zoning restrictions and property prices using a different approach from the authors mentioned above. The influence of these zoning restrictions will be first examined by analyzing a set of data the author has assembled for 23 European countries. The Ease of Doing Business report published by the World Bank and which contains the specific number of procedures needed to grant a construction permit, is used as a benchmark for the level of restrictiveness of the individual countries (World Bank 2012). This data set is compared with a corresponding set of property prices (Cushman&Wakefield 2013) with the goal to find a causal relationship between property prices and zoning restrictions.

1.1 Noise Factors

There are, on top of zoning restrictions, many other factors which influence property prices and which will be considered statistical noise factors for the purpose of this research. I would like to mention a few of them here in order to outline a more comprehensive picture. For understandable reasons, the list is not all-inclusive and many others could be added. The influence of the business cycle on property prices, for example, is apparent. European states, however, vary in the degree to which their construction markets are able to react to changes in demand with increases in supply, as any delay results in an increase in property prices. The property market is also slow to react to increases and decreases in population by altering supply to match the changes in demand (i.e. building new houses, or even slower, removing them from the market). While each market responds at a comparable speed, the movement of people and businesses from one market to another, as well as changes in the business cycle, create imbalances. The interstate mobility of people, or more precisely the speed of the change in mobility, is a variable with increasing effects in Europe. Property prices do not change according to population changes in the long term, but in the short term they can change dramatically, as new buildings are not supplied fast enough, or are not removed from the market in case of population decrease. This definitely compelling area of research is examined, for example, by E. L. Glaeser (Glaeser & Gyourko 2005). In Europe, the majority of mobility happens within individual nation states (Cheshire & Magriny 2009), but also the mobility between national states is gradually increasing. Thus, the population is decreasing in some regions and increasing in others. This sort of inter-state mobility will have, and in some cases has already had, a profound impact on property prices. 196 thousand people arrived in Ireland between 2002 and 2006 alone (Central Statistical Office 2007) (contrasted against a population of 4 million), resulting in a subsequent frenzy of construction but also in a spike in

property prices – the construction industry has not supplied quickly enough. Of course, part of the spike was caused by an investment bubble, but the fundamental reason for the increase was the population influx. Estimation of the speed of movement of people is thus crucial here, for it is a significant determiner of property prices.

Looking at the somewhat flexible labor market in the United States, some of the major cities have drastically depopulated in the past. In the long-term, an average of three percent of people change their state of residence every 10 years (U.S. Census Bureau 2012). Considering the pro-migration policies of the European Union, for example, in which pensions are collected by the state and awarded proportionally to anyone who worked in any given state for at least two years despite their place of permanent residence, the change to match the equivalent of U.S. migration levels may occur quickly.

Language represents the most significant cost for migrants. But on the other hand, differences in income levels in Europe are much higher than in the U.S., which means that if they cross a certain level, migration pays off for the immigrant. This largely explains why migration between old EU states was meager until 2003, after which new member states took advantage of open borders and contributed significantly to inter-state migration. After all, the differences in income levels between old and new member states are much larger than among old member states alone.

As mentioned at the beginning of this section, there are many other proven or contested influences on property taxes. These, even though very interesting are of the research, are not being examined in this paper.

2 Data and Analysis

This paper sets out to find a correlation between constricted supply of housing and property prices. The data used is the World Bank's report on Doing Business 2013 (World Bank 2012), which among other things lists the number of procedures the developer (or other entity) has to undergo to start building of an industrial property – these are planning permits, construction permits, various notifications and consents to local authorities, and so on. The report uses a hypothetical company set up to build the same two-story 1300m2 industrial estate, identical in every country (for more detail on the methodology please see (World Bank 2012)). For the sample of 23 European countries, this number of procedures is on the scale of between 7 and 36. The selection of the data is not ideal, but the main assumption – less permits means less restriction – seems to apply.

The number of procedures is compared with the local property prices of the industrial properties (Cushman&Wakefield 2013), and corrected for the gross domestic product of the economy (on nominal per capita bases) (IMF 2014). The assumption is that in an ideal economy, where the GDP is evenly distributed, the property prices would be a result of, among other factors (in this paper regarded as noise factors), the availability of supply. Hence, the restricted supply would mean higher prices. Selection of industrial estates have two additional advantages. First, the prices are less influenced by changes in population (which is a noise factor), and second, by using rents instead of property prices, we partly remove price increases attributable to speculation (also

a noise factor). Thus, we may expect to find a stronger relation between restriction and price than in other sectors of property market.

As the GDP in individual countries varies, the prices need to be corrected for its impact. Similar methodology is commonly used in the calculation of the Economist House-Price index (The Economist 2013), where the prices are corrected by the average personal income. This paper's calculations, however, deal with industrial estates, whose values are predominately derived from the value of goods which are exported and traded in nominal terms. That is why the nominal per capita gross domestic product seems a more accurate basis for correction than, say, personal income, or GDP in PPP terms.
For details, please see Table 1 in Chapter 6 – Appendixes.

3 Conclusions

Chart 1 lists all 23 countries, and finds the correlation of the two variables at R^2=0.410 painting a strong relationship. The markets above the trend line are overpriced by factors not considered in the scope of this research. The most overpriced is Bulgaria, where a number of noise factors can be guessed – the most often reported would probably be corruption. On the other hand, the Czech Republic seems to be the most underpriced, and in the author's opinion, this may be a result of the limitation of the data used – the 33 procedures necessary to obtain the construction permit are not necessarily a representation of restrictive policy. Looking closer in the data sheets of the Doing Business Report (World Bank 2012), these procedures are mostly notifications to various local authorities, and do not necessarily have such a restrictive impact.

Chart 2 is simply a repetition of Chart 1, with the two noise data points for Russia and the Czech Republic removed. The correlation consequently decreased to 0.3241, which is still a very strong influence, considering the number of other factors which also influence property prices. The slope of the relationship of 0.0886 suggests that for every procedure added, the price increases by 8.86%. This, as is stated in the assumption, does not mean that prices can be lowered by simple removing procedures. They are only used as a benchmark for wider restrictions. However, the relation between the number of procedures and the wider restriction is an apparent limitation of the research, which is clear, for example, in cases of Belgium and United Kingdom. Belgium has supplied the best price/GDP ratio of the whole sample. However, the 13 procedures necessary to obtain a construction permit move it close to average (14.65) in restrictiveness. In this case, we can see the limitation: research by Cheshire, Paul and Vermeulen, W. (2009) and Halleux, J., (2008) has shown the abundance of construction land in Belgium, which however does not show in our "number of procedures" benchmark. Similarly, the over-constricted United Kingdom is, thanks to its otherwise well-managed bureaucracy, very close to the correlation trend line.

In more general conclusion resulting from this analysis, we can conclude with a relative strong certainty that the relation between restrictions on development and property prices exists and has considerable influence. The comparative study on the sample of the planning policies in European countries has however shown that this relationship is often not being considered.

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Appendixes

Tab. 1 European Industrial Property Prices in relation to GDP and Number of procedures needed to obtain a construction permit.

Country	Rent sqm/year (Cushman&Wakefiled snapshot, June 2013)	Gdp per capitaIMF 2012 list of countries gdp per capita nominal (dollar euro rate on June 2013 0.75)	Number of procedures to get the construction permit (World Bank, June 2013)	Rent / GDP per capita (Average for the sample = 100%) ratio	Z Value Nr. Of Procedures	Z Value Property Price
AUSTRIA	€ 49.80	€ 34,981.50	13	43.29%	-0.24	-0.86
BELGIUM	€ 40.60	€ 32,711.25	13	37.75%	-0.24	-0.94
BULGARIA	€ 42.00	€ 5,254.50	18	243.08%	0.48	2.16
CZECH REPUBLIC	€ 47.10	€ 13,968.00	33	102.55%	2.63	0.04
DENMARK	€ 55.83	€ 42,319.50	8	40.12%	-0.95	-0.90
FINLAND	€ 74.00	€ 34,225.50	16	65.75%	0.19	-0.52
FRANCE	€ 63.00	€ 30,917.25	9	61.97%	-0.81	-0.57
GERMANY	€ 70.28	€ 31,398.75	9	68.06%	-0.81	-0.48
GREECE	€ 48.00	€ 16,554.00	19	88.18%	0.62	-0.18
HUNGARY	€ 42.00	€ 9,489.00	18	134.61%	0.48	0.52
IRELAND	€ 65.00	€ 34,488.00	12	57.32%	-0.38	-0.64
ITALY	€ 48.50	€ 24,836.25	11	59.39%	-0.52	-0.61
THE NETHERLANDS	€ 58.07	€ 34,507.50	14	51.18%	-0.09	-0.74
NORWAY	€ 139.00	€ 74,377.50	10	56.83%	-0.67	-0.65
POLAND	€ 53.20	€ 9,531.75	18	169.74%	0.48	1.05
PORTUGAL	€ 51.00	€ 15,027.75	13	103.21%	-0.24	0.05
ROMANIA	€ 40.80	€ 5,954.25	15	208.39%	0.05	1.64
RUSSIA	€ 103.90	€ 10,726.50	36	294.57%	3.06	2.94
SLOVAKIA	€ 43.20	€ 12,755.25	11	103.00%	-0.52	0.05
SPAIN	€ 60.00	€ 21,502.50	9	84.86%	-0.81	-0.23
SWEDEN	€ 101.63	€ 41,110.50	7	75.18%	-1.10	-0.37
SWITZERLAND	€ 120.67	€ 59,160.00	13	62.03%	-0.24	-0.57
UNITED KINGDOM	€ 85.91	€ 29,370.00	12	88.95%	-0.38	-0.17
Average	€ 65.37	€ 27,181.17	14.65	100.00%		
Standard deviation σ			6.975788537	66.18%		
2.5 σ			17.43947134	198.55%		

Upper Outliner Criteria (mean + 2.5σ)			32.09	298.55%	2.5	2.5
Lower Outliner Criteria (mean - 2.5σ)			-2.79	-98.55%	-2.5	-2.5

Sources:

(Cushman&Wakefield 2013)Marketbeat Industrial Snapshots Q2 2013 (2013), Cushman & Wakefield Research Publication

(IMF 2014)International Monetary Fund, List of GDP per Country

(World Bank 2012) World Bank, (2012), Doing Business 2013:

Chart 1:

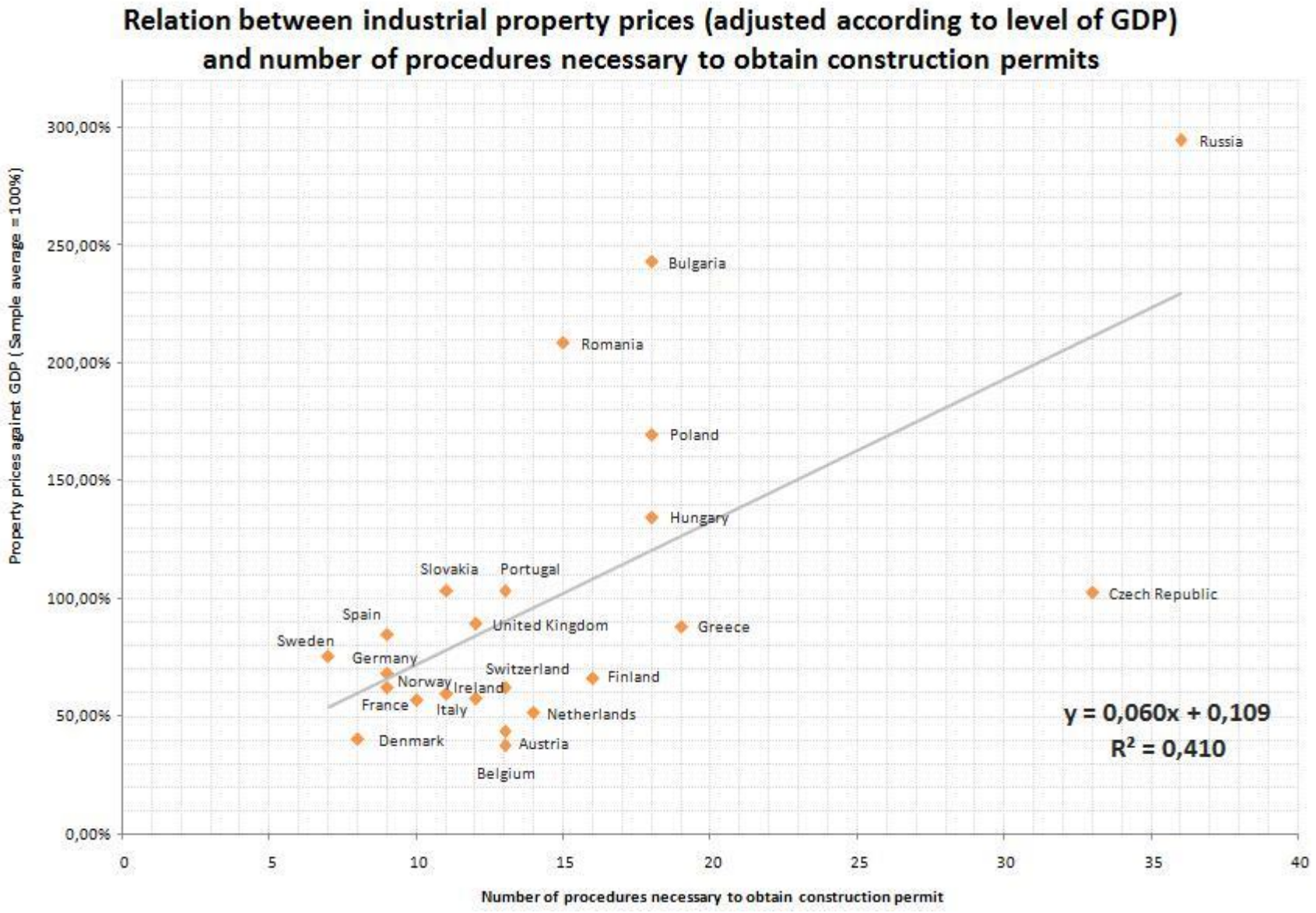
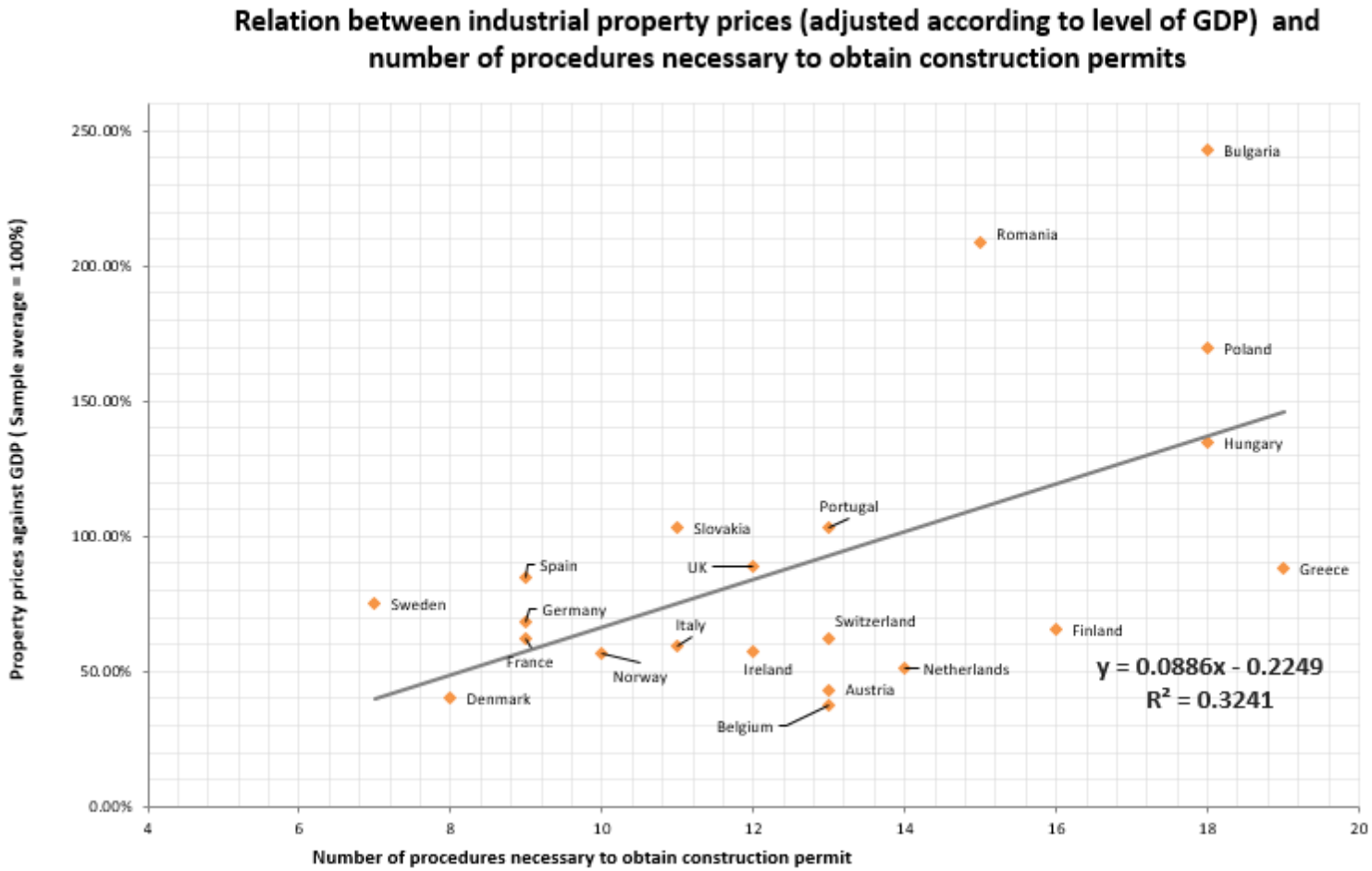

Relation between industrial property prices (adjusted according to level of GDP) and number of procedures necessary to obtain construction permits
Property prices against GDP (Sample average = 100%)
300,00%
250,00%
200,00%
150,00%
100,00%
50,00%
0,00%
0
5
10
15
20
25
30
35
40
Number of procedures necessary to obtain construction permit
Russia
Bulgaria
Romania
Poland
Hungary
Slovakia
Portugal
Czech Republic
Spain
United Kingdom
Greece
Sweden
Germany
Switzerland
Finland
Norway
Ireland
France
Italy
Netherlands
Denmark
Austria
Belgium
y = 0,060x + 0,109
R² = 0,410

Chart 2:


Relation between industrial property prices (adjusted according to level of GDP) and number of procedures necessary to obtain construction permits
Property prices against GDP (Sample average = 100%)
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
4
6
8
10
12
14
16
18
20
Number of procedures necessary to obtain construction permit
Bulgaria
Romania
Poland
Hungary
Portugal
Slovakia
Spain
UK
Greece
Sweden
Germany
Italy
Switzerland
Finland
France
Norway
Ireland
Netherlands
Austria
Denmark
Belgium
y = 0.0886x - 0.2249
R² = 0.3241