Activity of Purchase of Flats in the Area of Public Urban Planning and Architecture Intervention

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Abstract. Urban space serves a variety of purposes, especially the public ones. The study of the literature suggests that the improvement of road infrastructure, the location of a new public transport network or the emergence of green areas in the city should increase the value of neighbouring real estate. The municipal authorities' intervention in public space has a formal and legal dimension in the form of local land use plans. Since the planning arrangements are open, participants of the real estate market make their decisions rationally. Unfortunately, in practice the implementation of public tasks in urban space affects neighbouring residential properties: their attractiveness and, as a result, their market value. The article will analyse market effects on residential properties located in the vicinity of new investments such as public urban-architectural intervention. The research was conducted on the local market in Szczecin. The paper looks at changes in prices and activity of residential property buyers in the vicinity of new public investments in the period of 2005-2019. For this purpose, both statistical tools and methods of visualization of the studied phenomena were used.

1. Introduction
In both economic theory and practice, the concept of state interventionism is not uniform. It most often refers to the active influence of the state on the national economy, so the term refers to economic and political relations which consist in direct state interference in the market. On the other hand, it is also generally acknowledged that it is also an economic theory introduced by J.M. Keynes. The active role of the state and its institutions thus means a systematic, orderly influence of the state on the overall economic processes. In market economies, however, the state interventionism means preserving the importance of market mechanisms that underlie economic processes. Additionally, the state's activity in the economy is assumed to encourage its development.

The paper deals with the issue of state intervention, or more specifically of its public institutions on a local scale. The author analysed the impact of public intervention in urban space in the way of infrastructure investment and accompanying changes in street furniture. The projects designed and implemented in the studied area of the city were integrated into a broader programme of changes in the central urban space of Szczecin. The effects of the modernising the main communication route of the city were described as external factors influencing the residential property market. The author also supported her considerations with the examples from the non-residential property market. The purpose of the paper is to identify the external effects (positive and negative) of modernisation works carried out (i.e. of the intervention of the local authorities in the city infrastructure). The hypothesis of positive influence of this intervention on the local residential property market is verified. In the
research process literature studies were carried out, simple statistical tools were also used to analyse the structure and dynamics of real estate transactions, therefore the chapter on research methods was omitted in the paper.

2. Literature review

Interventionism is associated primarily with state interference in the economy, although even in such an approach it is not understood uniformly. In scientific terms, interventionism is seen as a kind of economic doctrine, particularly that of J.M. Keynes and his followers [1]. It is also a system of methods and means of the capitalist state's influence on the market mechanism with a view to achieving certain general economic goals. Finally, it is an economic policy on a macroeconomic scale. Unfortunately, the role of interventionism in shaping market mechanisms on a micro-scale is not sufficiently recognised as regards the effects of intervention on the shaping of market mechanisms in the closest environment of the local intervention [2], especially as it is often legalised in local legal regulations [3]. The key element of effective intervention is to avoid negative effects on the neighbourhood as well as to optimise urban development and its functions [4].

Public intervention disrupts the theoretical mechanisms of spatial distribution of urban functions. The classic urban layout is a concentric arrangement of individual functions starting from the very centre, to downtown districts and to peripheral zones [5]. The concentric arrangement indicates similar circles delineating the city centre, its downtown and peripheries, which in effect diversifies the prices of the flats for sale. The closer the city centre and the shorter the distance to the urban functions, the higher the residential property prices [6]. Moreover, the further away from the centre, i.e. along each successive circle, the lower the buyers' interest in living in a given area, e.g. due to the cost of travel [7]. The planned traffic changes are not always understandable for residents, although from the point of view of decision makers they are in compliance with legal regulations and design standards [8]. The concepts of central places were developed by W. Christaller and continued by A. Lösch, whose views today mean the mutual attraction and complementation of (adjacent) urban functions in the urban space. Leisure areas attract housing functions in the neighbourhood while industrial facilities generate similar or complementary functions in the neighbourhood, e.g. warehouses. Often large commercial complexes appear in suburban districts around service and industrial areas. These are positive external effects of locating functions, around which complementary functions emerge [9].

Land use decisions affect metropolitan development, urbanisation and urban planning. Buyers of flats prefer both locations backed by convenient access to public transport [10]. But at the same time, they increasingly often choose enclaves of suburban developments, thus intensifying urban sprawl processes [11]. Concentrating real estate of the same purpose in one place allows to achieve additional benefits, such as improved infrastructure or the emergence of public institutions and general development of a given area due to an increased number of investments of a similar nature. A given location becomes fashionable and prestigious, which results in the consolidation of a given function in a specific part of the city. Hence the uncontrolled direction of city development and the above-mentioned urban sprawl into suburbia. As a result, the areas located outside the strict city centre begin to gain in importance and start to be taken into consideration when making land use decisions. These areas are more attractive in terms of land prices, and as a result of infrastructure development, they benefit from conurbation effects. The living standards as well as the functioning of businesses in the non-residential premises in the strict city centre are deteriorating, which reinforces suburbanisation. In the phase of deurbanisation, the centres become overloaded, and thus the beneficial effects of conurbation fade away [12]. Eventually, the suburbs lose their attractiveness as well and the migration of residents from one city to another begins. Cities that play a major role in a given region decrease in importance, and medium-sized cities gain in popularity. The slowed down development of the outskirts aggravates the loss of significance of the city centre [13]. However, the residents' choices are not always consistent with the concepts of city development proposed by local governments in the form of land use planning documents. Local
communities choose locations which they regard optimal also for economic reasons. Yet, the urban sprawl has also a detrimental effect on the attractiveness of areas with highly developed infrastructure, while newly urbanised areas, the so called "unadapted areas", are not yet equipped with appropriate technical and social infrastructure. The process of urban sprawl is accompanied by depopulation of city centres, degradation of their spatial order and functions, and by the dispersed settlement structure. As a result, this leads to higher costs of construction and social infrastructure maintenance that are borne by local government budgets. This makes it difficult to finance such public administration tasks as the improvement of the existing infrastructure in populated areas, as regards supply lines, roads or educational institutions. Thus, the process of urban sprawl brings substantial spatial, economic, social and ecological effects. It is also the process of gentrification [14], i.e. the displacement of local population as a result of new investments [15].

The effects of wrong public intervention in urban space often necessitate compensation for owners of properties that consequently lose their market value or their purpose of use becomes significantly reduced [16].

3. Research area
Szczecin is a Polish city located in the northwestern part of Poland, on the Oder River and Lake Dabie, 15 km from the border with Germany and 100 km from the Pomeranian Bay and the Baltic Sea. It is an important transport hub at the intersection of the north-south (S3 expressway) and east-west (S6 expressway) axes, with its vast road, air (Goleniów Airport), sea and inland water transport network. Szczecin is the capital of the Zachodniopomorskie Voivodeship, with a population of over 400 thousand. The city is surrounded by three massive primeval forests: Puszcza Wkrzańska to the north, Puszcza Bukowa to the south and Puszcza Goleniowska to the east. With the area of 300.55 km² Szczecin is the third largest city in Poland. Almost a quarter of its land is covered by water, which together with the forests and parks determines the urban and spatial layout of the city.

In the transport system of Szczecin (divided into two parts by the Oder River and its branches), the main streets running through the city centre are: Aleja (avenue) Wojska Polskiego, ulica (street) Bolesława Krzywoustego and ulica Ku Słońcu, which are at the same time national roads leading to the Polish-German border or to the right-bank part of the city. Hence, the established function of these thoroughfares was associated primarily with congested road traffic, public transport interchanges, and thus the presence of commercial and service facilities. Housing functions resulted from the existing pre-war multi-family buildings, being mostly municipal resources requiring revitalisation. The long-term plan for the revitalisation of central Szczecin provides for the removal of car traffic from the city centre in favour of pedestrian and bicycle routes, supported by public bus and tram transport. This is possible thanks to the construction of the city bypass (Western Ring Road), the future metropolitan railway and the Park&Ride car park linked to the fast tram line connecting the left and right banks of the river.

3.1. Characteristics of the area under analysis
The area analysed in the article covers six blocks of dense development in the centre of Szczecin along one of the main transport arteries of the city, i.e. ulica Bolesława Krzywoustego (hereinafter ul. B. Krzywoustego). The area is bounded by two parallel streets: ulica Andrzeja Małkowskiego (hereinafter referred to as ul. A. Małkowskiego) and ulica Władysława Łokietka (hereinafter referred to as ul. W. Łokietka), to the west by Aleja Piastów, and to the east by Aleja Wojska Polskiego (see Figure 1). The analysed trapezoid-shaped zone is additionally intersected by two parallel streets - ulica Królowej Jadwigi and ulica Ks. Bogusława X.
In 2006, ul. B. Krzywoustego was modernised considerably (0.58 km of the road). The works included reconstructing the street together with its technical infrastructure, reconstructing the tramway track (0.78 km), removing the existing bus and tram stops between two large squares connected by the artery. The road surface and the tramway track were modernised, thus reducing the traffic noise caused by cars and trams. The curbs were raised, and above all, as part of the reconstruction of the road system, the curbs of the roadway in ul. B. Krzywoustego were moved away from the buildings, which made it possible to introduce street greenery and elements of street furniture (Figure 2). As part of the project, the dilapidated tramway track was rebuilt in a system allowing for the introduction of road traffic onto the track. As a result, pavements on both sides of the roadway were widened. That allowed for a reaching a compromise between maintaining the traffic function and improving the service, commercial and residential function of the street. Street furniture was put in place, protective and decorative greenery was planted and illuminated at night, thus increasing the aesthetics value of the street and silencing the adjacent pedestrian routes. 1.23 km of new pavements was built, 136 lighting posts were installed and 3.66 km of environmentally friendly infrastructure were built. At the same time, parking spaces along the street were eliminated. Today there are two traffic lanes in both directions, each 3.25 m wide. The roadway has been adapted to the applicable transport standards, while at the same time shortening the time of travel along the entire length of the street. The project also included a comprehensive reconstruction of the technical infrastructure: general sewage system, water supply system, catenary system and the existing lighting and traffic lights. The old sewerage and water supply network reaching the surrounding buildings was also replaced.
As a result of the works, especially the disappearance of parking spaces and public transport stops along the entire section of ul. Krzywoustego, the adjacent buildings and surroundings have lost their commercial and service character in favour of the residential function. Few still operating retail units are at risk of following the ones that have not survived, thus increasing the vacancy rate, also as a result of this function being taken over by the only larger retail and service facility in this street, i.e. CH Kupiec (at the corner of ul. B. Krzywoustego and Ks. Bogusława X). The absence of parking space is not compensated for by the underground car park of the said facility (93 paid parking spaces) and insufficient paid parking zone along perpendicular streets that are occupied mainly by residents on the daily basis.

3.2. Statistics on turnover of flats and non-residential dwellings in the area under study

The research area (Figure 1) covered the aforementioned six blocks of multi-family housing, mostly dating from the turn of the 19th and 20th century, located along ul. B. Krzywoustego. In the years 2005-2019, 366 flats and 68 units with commercial and service functions were traded on the submarket thus singled out. The sold units were located on the ground floor of tenement houses or in outhouses. The number of transactions concluded in the entire research area and along ul. B. Krzywoustego was determined basing on information from notarial deeds, as broken into residential and non-residential premises (service and trade), signed between 2005 and 2019.

![Figure 3. Number of flats sold in 2005-2019](image_url)
Two peaks on the specified residential property market (also in the area of ul. B. Krzywoustego) were reported in 2015 and 2017, which was mainly due to the phases of the business cycle on the real estate market and the market rebound after the economic downturn started in 2008 (Figure 3). After the modernisation of ul. B. Krzywoustego, the growth rate of transactions in this location was higher (17% YOY) than in the entire research area (16% YOY).

![Two peaks on the specified residential property market](image)

**Figure 4.** Number of transactions in non-residential properties in 2005-2019

The specified retail and service property market hit the high in 2013-2014, while the area of ul. B. Krzywoustego it peaked twice in the years 2009-2010 and in 2016. Nevertheless, those transactions were scarce, especially during the boom of 2006-2008 and after the modernisation of the street.

In the period of 2005-2019 (Figure 4), prices of apartments off ul. B. Krzywoustego were on average PLN 380 per sqm lower than along the street, even though the average size of apartments sold in ul. B. Krzywoustego was smaller by 7.27 m² than in the entire research area (Table 1).

| Statistics          | Research Area | ul. B. Krzywoustego |
|---------------------|---------------|---------------------|
| Mean                | 3 383         | 3 763               |
| Standard Error      | 63            | 2.56                |
| Median              | 3 304         | 3 681               |
| Mode                | 3 226         | 5 133               |
| Standard Deviation  | 1 196         | 27.34               |
| Kurtosis            | 0.49          | -0.19               |
| Skewing             | 0.37          | 1.08                |
| Scope               | 7 435         | 140.89              |
| Minimum             | 387           | 13.50               |
| Maximum             | 7 822         | 154.39              |
| Number              | 366           | 114                 |

Author’s own calculations based on notary deeds.

Both unit transaction prices and the size of sold flats were characterised by symmetrical distributions, while the total price was characterised by slight asymmetry. The traded flats varied...
substantially in terms of their size from 13.5 to 176.24 m² in the research area, and from 13.50 to 154.39 m² in ul. B. Krzywoustego. The correlation between the unit transaction price and the floor area of the apartments was negative and amounted to (-0.32) in the entire research area, while in ul. B. Krzywoustego the correlation was stronger (-0.55), which means that the larger the floor area of the property, the smaller the unit transaction price (PLN/m²).

As regards non-residential properties, unit transaction prices were higher in ul. B. Krzywoustego (PLN 5,339/m²) that the prices in the research area in general (PLN 4,480/m²). The main street turned out to be more attractive than the side streets, despite changes introduced due to modernisation. The median was used for comparisons due to the extreme asymmetry of unit prices in the research area. Significant differences were also found in terms of minimum and maximum prices (Table 2).

Table 2. Descriptive statistics of basic parameters of transactions involving non-residential properties in the examined part of Szczecin (2005-2019)

| Statistics          | Research Area | ul. B.Krzywoustego |
|---------------------|---------------|--------------------|
|                     | Price (PLN/m²)| Size (m²)          | Price (PLN)  | Size (m²) | Price (PLN)  |
| Mean                | 5 648         | 90 605 036         | 6 196        | 103 378 747 642 |
| Standard Error      | 532           | 14 154 348         | 760          | 37 385 253 |
| Median              | 4 480         | 65 225 410         | 5 339        | 45 252 000 |
| Mode                | 3 731         | 177 120 000        | x            | x         | x            |
| Standard Deviation  | 4 223         | 115 1 225 102      | 3 481        | 170 1 765 452 |
| Kurtosis            | 4             | 24 26              | 0,26         | 16 19     |
| Skewing             | 2             | 4 5                | 0,95         | 4         | 4            |
| Scope               | 20 809        | 792 8 280 000      | 12 518       | 792 8 267 500 |
| Minimum             | 687           | 10 20 000          | 1 460        | 10 32 500 |
| Maximum             | 21 496        | 801 8 300 000      | 13 978       | 801 8 300 000 |
| Number              | 64            | 64 64              | 21           | 21        |

Author’s own calculations based on notary deeds.

Due to the small number of non-residential property transactions in the research area (less than ten transactions per year), no far-reaching conclusions can be drawn. Therefore, in the further part of the paper the author focused on the residential property market. Unit transaction prices were higher in ul. B. Krzywoustego than in the entire research area, except for 2012 and 2014. After 2015, a greater discrepancy was seen and higher prices were paid for the flats located in the main street of the area rather than in the adjacent area. The biggest price fluctuations were recorded in the period of economic downturn, while the unit prices were the highest after the street modernisation in 2009-2010 and then again in 2018-2019 (Figure 5).
Figure 5. Dynamics of unit price of flats in research area between 2005 and 2019 (PLN/m²)

The next figure shows all residential property transactions concluded in the years 2005-2019, using Arc GIS and numerical maps from Szczecin’s geodetic information system. The brightest colour marks the buildings in which no flats were sold, the darkest colour indicates those buildings where eight and more flats were sold in the period under study. In order to improve clarity, the buildings other than residential ones were marked in pink, and the streets in grey (Figure 6).

Figure 6. Number of residential property transactions in research area in 2005-2019

As it can be seen in Figure 6, the highest concentration of transactions was in ul. B. Krzywoustego, particularly at its eastern end in the vicinity of Plac Zgody. It is also the area of a large city transport hub with tram and bus lines running in all directions as well as enclaves of green squares and parks. In
addition, a higher number of flats were sold in the central part of the street, at No 14 and in the corner tenement houses at the intersection with ul. Królowej Jadwigi. It can be concluded that over the analysed period more flats were traded in the street in question than in the adjacent streets.

4. Results and discussions

Literature studies and other researchers’ findings have suggested that improving the quality of the neighbourhood as a result of interference with the urban tissue by changing the character of the main street should clearly influence the vitality of the local residential market. This impact should be reflected both in the changed number of concluded residential property transactions along with the increase in transaction prices. However, the present study has shown that this process is not so apparent, although greater activity of apartment buyers and higher prices of flats in the modernised street have been observed.

Over the years under study, an increased traffic along the street could be observed, which, due to its residential function, was no longer so bothersome. As a result of the modernisation of tramline track, the noise was reduced and the water and sewage infrastructure improved, which translated into lower operating costs (fewer breakdowns). Pedestrian-friendly traffic routes were created along with street furniture. Negative effects of the modernisation project include the reduction of the already insufficient parking space, as well as the elimination of tram and bus stops at the intersection with ul. Ks. Bogusława X. As a result, there are no intermediate stops along the entire length of the modernised street. Contrary to the original assumptions, these two elements have reduced pedestrian and automobile traffic, thus affecting the local business.

The situation is aggravated by the ongoing process of suburbanisation, as it results in the outflow of population to neighbouring municipalities and the declining attractiveness of centrally located housing stock. That process began in the 1990s when the transformation to the market economy released huge resources of real estate in Poland, prompting individual investors to look for suburban locations where they could build their own family houses. Suburbanisation was typical for the cities in Central and Eastern European countries that had been undergoing political and economic transformation [19]. The outflow of investors outside the city limits was caused by more favourable infrastructural conditions in neighbouring communes and, obviously, by low prices of building plots. At that time, the city authorities were not prepared to develop new land in order to sell it as building plots. Consequently, the highest-income citizens were pioneers who initiated urban sprawl in Szczecin. On the other hand, for many years the city centre and housing developments remained under the municipal management, with its underinvested housing stock and with many tenants of low economic status. It was not until the last decade that the popular perception of the city centre improved as a result of the sale of municipal flats to tenants and due to the implementation of the city centre revitalisation programme.

In the successive studies, with a view to obtaining additional information on the impact of the modernization and functional transformation of ul. B. Krzywoustego, it seems advisable to carry out qualitative research concerning both buyers of flats, i.e. to identify their rationale for choosing this particular location, as well as those local residents who could share their subjective opinion on the changes in the environment and the quality of the neighbourhood after modernisation. However, such
surveys are costly and, in addition, face-to-face interviews have been difficult to arrange due to the limitations caused by COVID-19.

5. Conclusions
The re-urbanisation should be seen as a process of modernising and reconstructing of the city, including its central part. It brings about a broadly understood upgrading of urban and social infrastructure, which results in a reflow of people into the city centre. This process is associated with public intervention regulated by local acts of law such as the local land use plan or local revitalisation programmes. They are bound both to the principles of sustainable development, including environmental protection, but also to the preservation of historic landmarks and urban systems with their cultural, historical and architectural value. Ironically, they also pose serious limitations in public investments in city centres.

On the other hand, concepts are emerging to bring the space of city centres back to life through citizen-friendly infrastructural investments and investments in street furniture. Each of these interventions in the urban tissue has its own external effect on the real estate market. This effect may be negative, in the form of reduced activity of investors, increased vacancy rate, or positive manifesting itself in increased property prices, improved social composition of the city centre. Each of the public interventions resulting in functional changes and transformations of urban space should be preceded by an analysis of its impact on the real estate market, which translates into the behaviour of real estate market participants, and in the longer perspective into uncontrolled suburbanisation, gentrification or reverse processes.

Acknowledgment(s)
The project is financed within the framework of the program of the Minister of Science and Higher Education under the name "Regional Excellence Initiative" in the years 2019-2022, project number 001/RID/2018/19, the amount of financing PLN 10,684,000.00. Special thanks to Patrycja Foryś M.Sc. for the graphic design of the map (Figure 6) in ArcGIS.

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