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LOW INTEREST RATES AND UNCREATIVE DESTRUCTION IN THE OFFICE MARKET

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ABSTRACT

Low interest rates were introduced in the global economy to support the weak economic growth that followed the global financial crisis. In the real estate sector, low interest rates usually lead to a boom in investment and prices. This boom, however, is not spread throughout the economy, but rather concentrated in major cities. We demonstrate this phenomenon on the example of the office market in Warsaw (Poland). While it would be beneficial for the Polish economy to develop office space in smaller cities that have an insufficient supply of modern office space, investors have focused mainly on the capital. This has not only led to an increase in the cost of building land and construction, but has also pushed some relatively new existing office buildings off the market. We call such behaviour uncreative destruction and explain why it was possible.

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1. Introduction

Despite the COVID shock, which significantly disrupted the normal functioning of the economy in 2020-21, in 2022 we were still seeing a very strong inflow of capital into the office property sector in Poland, particularly in Warsaw. As a result of the construction of new buildings, with stable demand, we are seeing a slow, further increase in vacancy rates, and potential declines in the profitability of such investments. We therefore ask ourselves what motivates investors to further invest in this market, and whether this is justified from the point of view of the economic development of the country. A cursory analysis of the data, and in particular the strong concentration of investors on the Warsaw market, allows us to refer to Schumpeter (1911 and 1942, see also Nicholas, 2003) and paraphrase his famous "creative destruction". In our view, we are dealing with "uncreative destruction", or to use a different formulation, "misallocation of capital". Schumpeter observed that many processes of economic development may at first appear destructive, and may even temporarily weaken the economy. New technologies tend to make old ones, especially labour-intensive ones, redundant, so a lot of people lose their jobs. Moreover, it takes time before new technologies are fully implemented and widely used. The question that arises here and now, however, is what to do for the people who have lost their jobs as a result of technological change. It turns out that these people are finding jobs in sectors that have been created as a result of technological change. Although these jobs may not necessarily be as well-paid as previous ones, overall the economy is growing and people's welfare and well-being are improving. In the case of investments in modern office buildings,

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however, we are rather dealing with a situation that is appropriately described by the Polish proverb "better is an enemy of good". In a situation of overall strong economic growth, one would expect the filtering factor to kick in, i.e. richer companies will move out of office buildings they currently occupy into better ones, and the previous office will be financially accessible to less wealthy companies, which will be able to expand at lower costs. However, these new buildings are able, if only temporarily, to offer rents almost as low as the older, inferior buildings. Eventually, older but technically fully operational buildings lose tenants and are demolished, which can be considered a waste of resources.

It should be noted here that new construction is generally concentrated in the largest cities, where clusters of office buildings are emerging. This is not inherently a bad phenomenon: research by Fuerst (2007) on office rents in Manhattan shows that office buildings in clusters obtain higher rents than similar, separately standing office buildings. The author explains this by the fact that companies renting space in them value the synergy between companies, although they are ultimately competing against each other. Nevertheless, economies of scale cease to work at a certain point and one can speak of the misallocation of resources, as investors mostly bypass smaller markets, where demand for offices remains unsatisfied.

Globalization is having a very strong impact on the change of the Western World towards a knowledge-based economy. Coe et al. (2004) point out that, in Europe, globalization has increased economic interconnectedness within its regions. They call this phenomenon an apparent paradox, as regional economic links become more important within increasingly complex supply chains. It is worth adding in the context of the topic of our article that these authors, like most of the literature in macroeconomics, talk about knowledge and development, but as Ball et al. (1998) noted, they virtually ignore the importance of office space in this process. In this context, Potlogea (2018) presents the skilled city model, which explains why cities that focus on innovation can boast of strong economic and demographic growth. And here we must add that this author does not mention a single word abou toffices which offer the skilled jobs that create skilled cities.

The phenomenon of excessive investment in offices in a given location is known to literature. Grenadier (1996) analyzed construction cascades, i.e. a situation in which subsequent investors enter the same market, without taking into account the very aggressive competition that they generate. The reason for this phenomenon is excessive overestimation of economies of scale or simply knowledge of only this market by investor agents. In our case, the primary cause of the phenomenon is artificially low, non-market interest rates in the euro zone, which, through the excessively low cost of money and, consequently, capital, distort the economic calculation and lead to a waste of resources. Moreover, they encourage financial institutions to take excessive risks of losing collateral in the future for today's profits, de facto financed by credit. Gallagher and Wood (1999) also addressed the issue of construction cascades, focusing on the question of whether they can be predicted and prevented.

The problem of regionally unbalanced growth of the office stock was particularly often analyzed in Great Britain. Henneberry and Roberts (2008) present extensive literature on this topic and conclude that this concentration of office construction in London and a handful of other cities is contrary to both economic theory and empirical observations, which would justify a much more even distribution of office space among different cities. Henneberry and Roberts (2008) explain this behaviour with a unique benchmarking process in which each investor measures himself against a benchmark. The assessment of properties included in this benchmarking was determined by the IPD consulting company. This company collected information from investors and shared it in an anonymized form among them (it was taken over by MSCI in 2012). Investors who wanted to participate in benchmarking had to own benchmarked properties, so investments were concentrated in selected locations. The authors show that this was a suboptimal strategy, which caused most investors to choose investments generating sub-optimal rates of return.

A strong, locally concentrated inflow of capital also occurs in the sector of already constructed real estate, which causes a significant decline in their capitalization rate (see Chervachidze & Wheaton, 2013). As shown by the study above, this inflow of capital is caused by low interest rates and low risk perception on the market, which means that investors agree to pay more and more for a property generating the same income, and therefore accept a lower and lower rate of return on equity. Devaney et al. (2012) analyzed the efficiency of the commercial

real estate market in the UK in this context and concluded that it is inefficient because market prices are overvalued in relation to market fundamentals. Many investors make ad hoc decisions, ignoring the fact that the valuation of their properties may drop significantly, without the slightest fault on their part. It must be remembered that an investor's result is influenced not only by his skills, but also by the market environment. The occurrence of significant vacancy rates may have a negative impact on the effective rents of even a well-maintained and located building.

Research for the UK by Sarling et al. (2012) shows that investors prefer London and other largest cities, while in order to ensure sustainable development based on the knowledge economy, good offices in smaller cities that have appropriate human capital are also necessary. In order to expand the resources in smaller and medium-sized cities, they propose a number of solutions, including planning simplifications and cooperation with developers in order to provide adequate offices, not outdated class B ones.

Also in the case of Poland, regional disproportions in office construction can be noticed. Łaszek et al. (2017) showed that the construction of new retail space in relation to new residential space is constantly increasing in all Polish voivodeships, while in most of them, the ratio of new office space to new residential space remains rather flat. Only in the case of Mazovia, where the capital city is located and which has a GDP per capita close to the EU average, a similar proportional increase in office space and retail space can be observed. However, Stryjakiewicz's (2010) study on the development of regions of Central and Eastern Europe indicates the need to redirect the regional economy towards innovation and the knowledge-based economy, which requires both available residential and office space. In a more detailed way, Brzychcy (2014) shows how important the creation modern office space resources is for the development of work for young people in Szczecin, which will make it easier for large companies to decide to locate their services in Szczecin. A similar tone is expressed by Maleszyk and Sagan (2016), who examined the provincial city of Lublin and stated that the constant and sustained development of office space contributed to the increase in the attractiveness of the city for investors from the modern business services sector, which in turn contributes to the economic growth in this city.

Warsaw, the capital city has been naturally the first choice for foreign investors, as all important governmental agencies are located there, it has a lot of well educated workers and students, and international transport is well-developed. Over time, other large regional cities like Gdańsk, Kraków and Wrocław were also found to attract a lot of investors, who created a significant office stock there. Smaller regional cities, however, seem to have a problem in attracting office investors. While the retail and warehouse stock is more or less adequately distributed throughout Poland, there is little office space outside of the country's largest cities.

We need to close the literature review by looking at the effect of remote work on office demand and the reactions of office suppliers. The idea of remote work is not new, and the oldest article we found that discusses this matter is by Olson (1983). The author discusses how remote work affects the behavior of workers and, therefore, we assume that remote work was already implemented on a reasonable scale at that time. Recently, the outbreak of the COVID pandemic has made remote work a major mode of working. Gupta et al. (2022) analyzed the office market in New York, US, and found that working remotely was disastrous for rents and office property values. The best office buildings were less hit, due to a flight to quality. This remote work boom will have a lasting impact on the decisions of office investors, but as Aksoy et al. (2022) and Davis et al. (2023) show, it will have also an impact on work organizations as well as house prices and commercial real estate other than office buildings. This results mainly from the fact that, as we observe also for Poland, people who work remotely search for bigger flats or even detached houses, which means that their personal lives moves away from the classical city center.

2. Material and methods

Two methods were used to explain the phenomenon of relatively new office buildings being replaced by newly built ones. First, we explain, using the classic Cobb-Douglas production model, how a strong reduction in interest rates changes the optimal proportion of physical and human capital in the office building construction process. In the second step, we present a simple model for calculating profits and losses from investing in a new office building. Additionally, after pointing to the high competitiveness of a modern office building, we explain that it can even reduce the costs resulting

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from the building's depreciation in the first few years, which gives it further room to reduce rents and still generate profits.

We start with the classic Cobb-Douglas model of selecting physical capital (land and construction materials) and human capital in the production process, which is presented in Figure 1. Starting point A is a situation in which, at certain interest rates (cost of capital) and wages (labour cost), the developer selects the appropriate level of expenditure that generates the optimal level of office production measured in square meters. After a significant reduction in interest rates, the relationship between labor and capital input changes. Taking into account the substitution effect and the income effect, we move from point A through point B to the new optimal point C. As a result of a significant drop in capital costs compared to labor costs, the investor decides to significantly substitute labor with capital. First, he buys more ready-made elements, which makes construction easier and faster. Better IT, telecommunications (ICT) and heating or cooling equipment can also be installed in the building. Moreover, he can afford to buy a more expensive, better located building plot. Collectively, this increases the competitiveness of the building. In the next step we explain the mechanism that we apply to explain why, under the low interest rates, the new building can ask for lower than market rents and still generate profits.

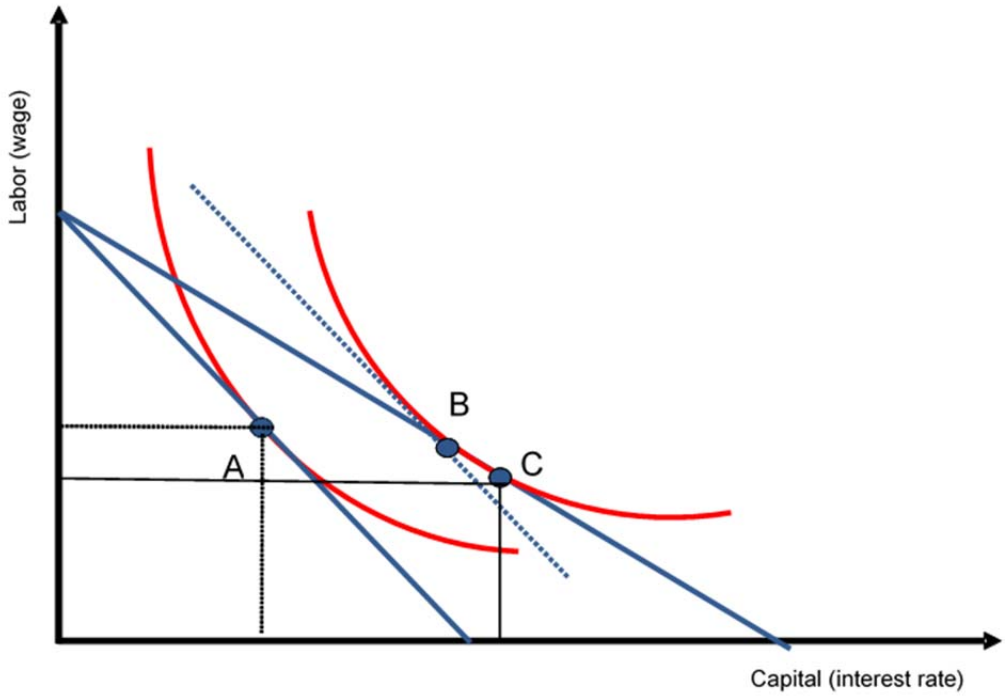

Fig. 1. A simplified Cobb-Douglas production function of real estate. *Source*: authors own calculations.

Our most important tool is the financial model, built for the purposes of conducting the research in question using a spreadsheet, containing: investment budget, calculation of net operating income, profit and loss account, debt service, cash flows and profitability analysis. The model was prepared assuming that the investment is carried out by a special purpose vehicle using a bank mortgage to finance the investment. This section of the article describes the basic assumptions of the model. For the purposes of the profitability study, the forecast included a 2-year construction phase and a 7-year operational phase (loan repayment period). The analyses were conducted in EUR, taking into account the annual increase in rents (including indexation of contractual rents) based on the forecasted (expected) HICP inflation, which was assumed in the model at an average level of 1.5%.

The project budget concerned the preparation and implementation phase of the investment and is a summary of investment outlays on the one hand and sources of financing on the other. The expenditure included, among others: expenses for land acquisition, design, supervision, construction, working capital fund, administrative expenses and investment financing costs during the construction period. The

sources of financing included equity (including land in kind and cash) and credit. A typical investment financing structure was adopted, which means that debt constitutes approximately 70% of total expenditure.

The calculations included the cost of the loan in the form of an interest rate of 2.5% p.a. on average, a basic commission of 2.5% and a commitment fee of 1.5%. Credit holidays (concerning capital repayments) were adopted for the implementation phase. The loan repayment was included in the operational phase in quarterly interest periods, at the adopted loan amortization rate of 2% per annum.

Net operating income was estimated taking into account rents for office space (for the first year of operation EUR 16.5/m2/month) and parking spaces (EUR 100/space/month). The calculation includes service fees (EUR 3/m2/month) and real estate agency commissions for new contracts in the amount of 8%. It was assumed that the target occupancy level was 95%, which would be achieved in the second year of operation.

Ownership expenses (charged to the special purpose vehicle) that are not included in the operating fees were included in the profit and loss account as administrative and general costs. The depreciation of capital expenditure will be taken into account assuming an average depreciation rate of 2.5%. The calculation of results at the level of net profit was prepared in a standard manner for this type of accounts.

For the purposes of the analysis, free cash flows for equity (FCFE) were calculated, which formed the basis for assessing profitability. The profitability of the model is examined using the internal rate of return (IRR). The analysis took into account the residual value calculated as the quotient of the income from year n+1 and the discount rate minus the rent growth rate "g". For the purposes of the simulation, the discount rate was assumed to be 8.5% and the rent growth rate to be 1.5%.

Data on average market rents come from the NBP report (2022, p. 25.26) and data on the construction costs of a class A office building calculated by Sekocenbud (2022)[1] are taken from the NBP report (2022, p. 25), where they are presented in total with the cost of land, while the average price of a class B office building calculated by NBP was taken from the NBP report (2022, p. 26).

[1]Sekocenbud, BCO Bulletin of process of construction facilities, part I - non-residential buildings, facility 1220-102.

3. Results

3.1. Basic research premises

The analysis of the rate of return and internal rate (IRR), made on the basis of the detailed settlement model presented above, allows us to simulate how resistant the investment is to increases in interest rates or a decrease in effective rent. A decline in effective rent occurs when vacancy rates in a building increase, or when an investor lowers the rent to compete with newer buildings. However, we decided to reverse this problem and asked the question of how much an investor can reduce the rent in a new class A building to compete with existing buildings. This question is necessary to understand why investors, despite the high market saturation, still build new buildings and start new construction projects. Our analysis shows that, although construction costs in 2021 were significant, the investor could reduce rents to EUR 15 per sq m. in a month thanks to low interest rates and still generate an acceptable income. Interestingly, in terms of rents the new building can compete with similar class A buildings, and even with class B buildings. Therefore, by offering much lower rents in the same class, or rents similar to those offered by much weaker buildings on the market, it can practically drain the demand for space on the market.

Another important factor that allows for rent reduction is the fact that the owner of a new building may not to have to put money aside for general renovation for some time. He writes off 2.5% of the building's value annually as depreciation costs from profit tax, but at the beginning, he can use these funds for various purposes. However, a rational owner of an older office building must save these funds to be able to carry out significant modernizations. It should be added that the generally used 2.5% depreciation of the building value per year is the value resulting from tax law, however, research by Baum et al. (2005) for offices located in London shows that the real depreciation is approximately 5% per year.

We present the impact of the possibility of temporarily abandoning savings for modernization on the competitiveness of a new building by analyzing variable and fixed costs and their coverage at various levels of building occupancy. Fixed costs, i.e. independent of the rental level, include management costs, loan costs and building depreciation charges. Variable costs, on the other hand, are the costs of maintaining cleanliness and heating or cooling a given floor, etc. We assume that the owner fills the building

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with tenants floor by floor. When a given floor is rented, even partially, costs arise for the entire floor. We observe a small jump in costs for every floor, but at the same time they are passed on to tenants in proportion to the share of space rented on a given floor. The costs and their coverage from rent (including coverage of variable costs) for a new class A building and an old class B building are shown in Figures 3a and 3b. We see that, in general, a class A building, which is expensive, also has much higher fixed costs than the cheaper building B. With market rents and an appropriate occupancy level, both buildings are able to cover the costs with rent. A modern building increases occupancy levels by lowering rent, so it has some freedom to choose between rent and occupancy levels. This is also the case during normal times with a Class B building. The problem arises when aggressive competition from new buildings reduces the occupancy rate of old buildings. If the occupancy level falls below the intersection of the rental income line and the cost line, the building owner experiences financial losses. When the owner of a modern building temporarily ignores depreciation costs, he can lower the rent to even below that of the old building in order to aggressively attract tenants. Of course, such a strategy will not be infinite, but it is enough to offer such competitive rents for a few, e.g. 3 years, to drain tenants from older buildings. Faced with this, their owners will either have to significantly reduce rents or decide to demolish the existing building and build a better and larger one in its place.

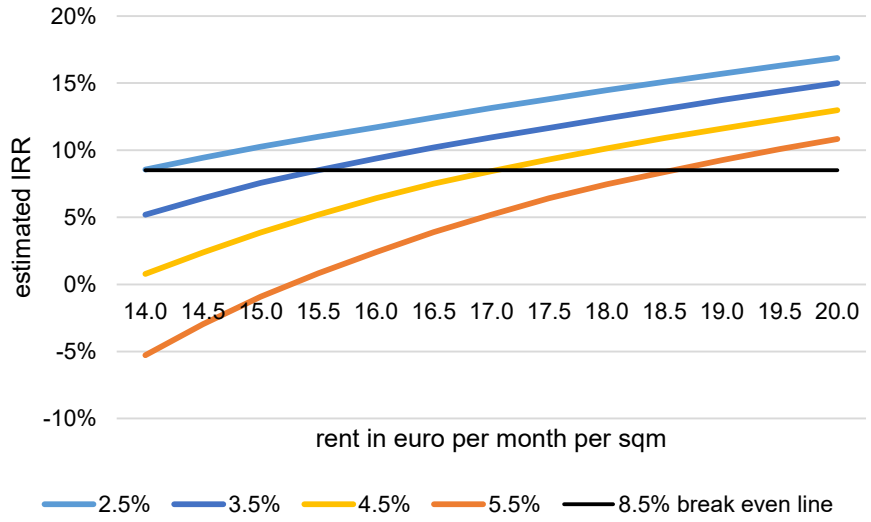

Fig. 2. Internal rate of return (IRR) on investment in the construction of a class A office building in Warsaw at different rent levels in euros and different loan interest rates in euros. *Source*: authors' own calculations based on NBP (2022) data.

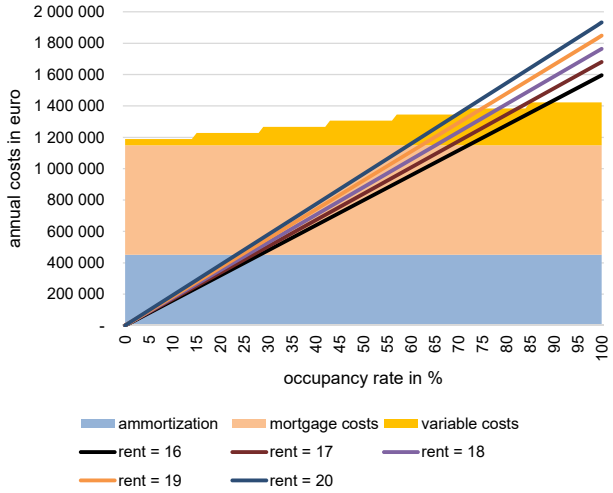

Fig. 3a. Fixed and variables annual expenses and their coverage by the rent, new class A office building. *Source*: authors' own calculation.

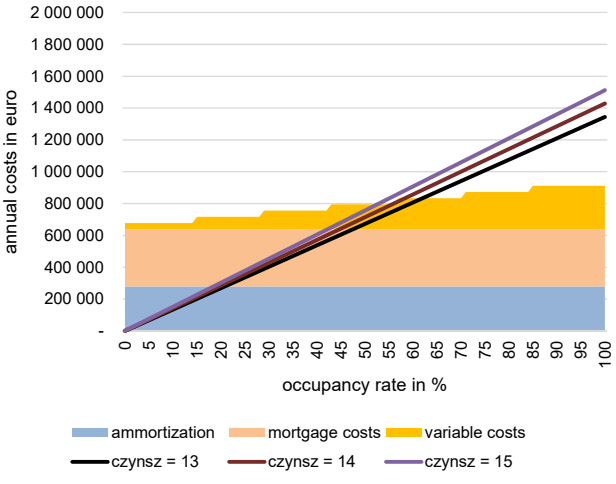

Fig. 3b. Fixed and variables annual expenses and their coverage by rent, existing class B office building *Source*: authors' own calculation.

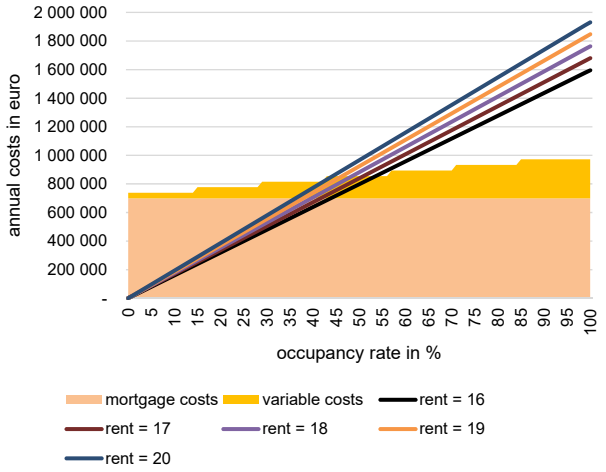

Fig. 4a. Fixed and variables annual expenses and their coverage by rent, new class A office building, now under strong competition. *Source*: authors' own calculation.

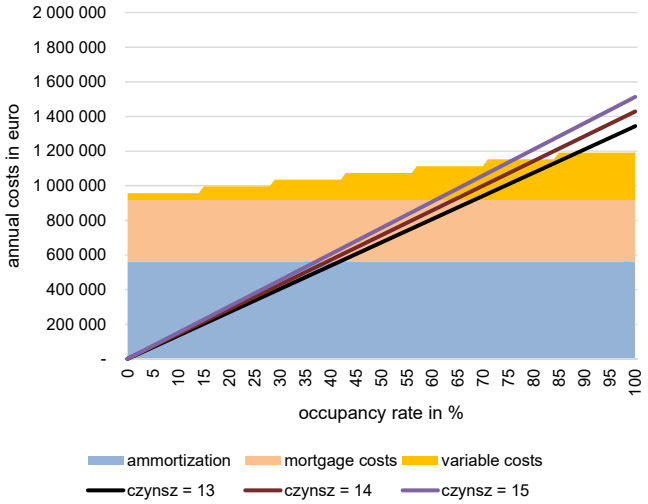

Fig. 4b. Fixed and variables annual expenses and their coverage by the rent, existing class B office building, now under strong competition. *Source*: authors' own calculation.

It should be added that the situation of an older office building may further deteriorate when we observe a significant investment boom in the office market, because then moral depreciation begins to take effect, and it exceeds the assumed 2.5% annual depreciation. The depreciation rate for an old building rises under fierce competition to 5%. This depreciation takes into account, apart from the classic depreciation, the fact that, due to the introduction of modern buildings to the market, old ones age faster. This phenomenon is also called obsolete property by Bryson (1997), who investigated it on the case of Nottingham and proposed solutions to apply capital intensive creative reconstruction works to older buildings to bring them back to life. However, Bryson looked at really obsolete buildings, while we observe buildings that become obsolete by wrong investment decisions.

4. Discussion

Our results help to explain why uncreative destruction is taking place on the office market, as buildings that look decent, but do not satisfy the current ESG requirements, are destroyed. We should also add that the expectations of investors rise as more energy efficient buildings enter the market. On the one hand, better buildings will result in lower energy usage, but on the other hand, we should also keep in mind that the destruction of older buildings generates a lot of waste. A long-term analysis of the gains from using new buildings over old ones in contrast to the waste the demolition of the older ones generates should be performed to gain an understanding of which strategy is the best. Moreover, the strategy of destructive competition carries a high risk because interest rates can rise quickly. The long maturity of mortgage loans in the face of relatively short monetary cycles indicates that this phenomenon is almost certain. Our analysis shows that, at low rents, even small increases in interest rates can create significant investor solvency problems because changes in the investor's income burden are a function of relative changes in the interest rate. It should be emphasized that these low interest rates are particularly important when the loan is practically not amortized, i.e. no capital is repaid and only interest is paid. For such a situation to occur, an additional long amortization period of the loan is necessary. In such conditions, the investor's current costs are lower compared to a private person who, in addition to interest, also has to repay the borrowed capital, and the investor also benefits from a tax shield. However, this is a dangerous tool because the debt can only be repaid when the developer sells the building, and until then, the value of debt does not change. If interest rates suddenly increase, interest payments will also increase, and the value of the building will decrease. At the same time, an increase in rates may cause a general cooling of the economy and, consequently, a decline in demand for offices. As a consequence, investors' problems will become problems for banks, which will lose the security for their loans and will not receive the due instalments.

This approach of investors is also suboptimal from the point of view of the economic development of the entire country. In the face of low rates, it is worth investing in another office building in a large city, e.g.

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Warsaw. The investor is convinced that he will rent his building, so he is less and less willing to enter smaller markets. And it is in these smaller markets that modern office space could become an important development factor. It should be added here that this problematic phenomenon is not observed on the trade market, where investors expect strong competition. Therefore, they choose places where they will be the first and can count on the profits from the first mover advantage, which, of course, is faced with a significant risk of failure. Displacement of existing shopping malls from the market is rare, but there are cases when a new player on the market is not successful and a given mall does not bring the expected profits from the beginning, and is consequently closed or significantly rebuilt. The issue of demolishing old buildings in order to build larger or modern ones was analyzed from an economic perspective by Hofbauer and Severn (1974). More recently, Baker et al. (2017) explain the decision making process when an investor has to decide whether to demolish or adapt the existing building. Besides the pure economic consequences of a demolition, Forsythe and Ahmadian Fard Fini (2018) show that there is a problem to recycle the outfits of office buildings and in case of Australia, more than half (measured by weight) of the outfit of demolished offices goes to landfills.

5. Research limitations

We should also mention some research limitations we faced over the course of the analysis. One stems from the fact that we analyze a given type of office building, while in reality, there are many different sizes and layouts. The second is the fact that we assume that land is bought at the same time that the construction process starts. In real life, investors have to buy the land in advance and it also takes time to obtain the necessary building permits. Finally, different investors apply different holding periods. We assumed that the investor sells the new office building after 7 years of renting it, but depending on the strategy, some investors sell a building just after they have rented it out, while others keep it in their portfolio for even 20 years. The abovementioned facts can have an impact on the profitability of the investment, however we believe our example to be representative and allow us to better understand what happens in the office market.

Due to the accessibility of data, we use the partially outdated distinction between class A and B office space. Nowadays, due to significant energy costs and Environmental, Social and Governance (ESG) considerations, one should categorize buildings into those which have certificates like BREAM, LEED, etc., and those that lack such a certificate. However, we can also assume that a class A office would earn such a certificate, while a class B office does not have it. Therefore, it is not only the current costs that make the new building competitive, but also the fact that it is suited to meet the ESG criteria which tenants expect. Wiley et al. (2010) show that LEED certified and EnergyStar-labelled buildings are sought after by tenants and obtain higher rents and better occupancy levels than other buildings. Also, investors put much emphasis on ESG, because it improves the economic performance of their commercial property portfolio, as shown by Eichholtz et al. (2019). The choice to build more office buildings in a given location depends only partially on low interest rates. Low interest rates certainly make it possible to take out large mortgages, and to substitute labour with capital during the construction process, which speeds up the construction process and facilitates the construction of even larger buildings. There are also, however, other factors. One important factor that had been mentioned in the literature review is the fact that investors like to cluster office buildings around already existing ones. Warsaw used to have a comparative advantage, as it is the capital, but this has evolved, which can explain the destruction of older buildings and the creation of new ones. Buitelaar et al. (2021) analyzes the problem of buildings that become obsolete as the city evolves, and this reasoning can be also applied to Warsaw. For example, the first large office cluster emerged close to the airport, in the post-industrial Służew area. A large office cluster could not be located in the inner city in the early 2000s as, at that time, most of development land there had a very unclear legal status. Only recently has this problem been resolved and office construction started at a great scale. This has made some of the offices in the Służew location obsolete. Another fact, analyzed thoroughly for the case study of London by Benjamin (1992), is the significant change of the size and quality of buildings that tenants seek, which also helps to explain why older office buildings get torn down and replaced by newer ones.

6. Conclusions

Our analysis shows that low interest rates, which were reduced in developed economies after the outbreak of

the global financial crisis in order to stimulate economic activity, contribute to the misallocation of funds in the office real estate sector in Poland. Investors can, thanks to the low cost of financing with loans, build modern class A office buildings in which, , they can, albeit temporarily, offer rents similar to those in older class B office buildings,. Especially in the face of the increasing frequency of remote work, where tenants prefer to reduce space and instead rent technologically and energetically more modern workspace, this may pose a significant threat to the functioning of older buildings. At the same time, we observe that, although investors could invest in smaller markets, they focus mainly on the capital city of Warsaw as well as a few of the largest cities. Therefore, an important question from the point of view of sustainable regional development arises: why are investors reluctant to choose smaller cities and what should be done from the point of view of the regions' economic policy to motivate them to also invest in smaller Polish cities that need modern office space for economic development.

We started to write this article while ECB interest rates were around zero. At the time we finished it, the ECB interest rates went up to 4.5%, along with a significant increase in energy prices. We will see in the near future what impact these factors will have on the office market as a whole as well as on new office construction.

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