

# “Real estate derivatives as financial instrument – possibility prospects of usage in Poland”

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Agnieszka Majewska (Poland)

# REAL ESTATE DERIVATIVES AS FINANCIAL INSTRUMENT – POSSIBILITY PROSPECTS OF USAGE IN POLAND<sup>1</sup>

## **Abstract**

The article refers to the theoretical framework of the possibility of using real estate derivatives in the Polish financial market. Although the Polish property market is well developed, and Poland is the leader in the Central and Eastern Europe region, there is a gap in the use of financial instruments concerning the property market. Given the lack of a property derivatives market in Poland, conditions and opportunities for this market development are presented. The experience of the United Kingdom and the United States in this field shows that one of the most important aspects is stable and a well-functioning financial market. Therefore, the macroeconomic data and the data of the Polish financial market are examined.

The analysis carried out indicates sufficient conditions and opportunities for the development of real estate derivatives in Poland. The macroeconomic data and data from the capital market have shown the economic environment's stability and balance. One of the limitations is the existence of a clear and respectable index used as an underlying asset in derivatives on the Polish market. Only WIG real estate index is listed on the Polish Exchange. Although there are sufficient conditions for introducing the real estate derivatives in Poland, the success of all financial innovations depends on the willingness of potential users to use them.

## **Keywords**

derivatives, real estate market, property indices, financial market

## **JEL Classification**

G10, G19, R30

## **INTRODUCTION**

Real estate derivatives are new instruments only available in developed countries with a well-functioning capital market, such as the United Kingdom, the United States, Germany, France, and Japan. The first attempt to create a market for property derivatives was made in May 1991 by introducing futures in the London Futures and Options Exchange. Syz (2008) mentioned that four contracts were offered. The underlying assets were indices for commercial property capital value, residential property, commercial rent, and mortgage rates. However, the market for property derivatives did not catch investors' interest in that time, and trading had to be suspended a few months after the launch. There is also a reference to the earlier use of financial instruments in the real estate market. Hinkelmann and Swidler (2008) have found that the early cases of use of financial assets on real estate are related to stocks and bonds introduced on the New York Real Estate Securities Exchange (NYRESE) in 1929. Due to the collapse of real estate and capital market prices, NYRESE was

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decertified in 1941 by the United States Securities and Exchange Commission. Nonetheless, nearly 30 years ago, derivatives related to the real estate market emerged.

Nowadays, more attention is paid to this market. Although property derivatives have gained importance in Europe, they are still not available in many developed countries. There are no real estate derivatives in Poland, so they are relatively unknown. This study attempts to clarify whether real estate derivatives have prospects of being introduced to the Polish market. This paper aims to investigate the surroundings of using derivatives in the real estate market.

The article focuses on the possibilities of using derivatives for the real estate market. The possibility of using real estate derivatives should be considered in the context of the property market's value, existing real estate indices, and legal and tax aspects of investments. Due to its specific nature, the latter aspect is only presented as a prerequisite for introducing new instruments to the market. Based on these criteria, the possibility of using real estate derivatives is determined.

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## 1. THEORETICAL BASIS

Derivatives are poorly perceived after the last financial crisis. They were generally associated with a highly leveraged and speculative use of these financial instruments. The use of derivatives for the real estate sector is rather new and has only begun in the last three decades. Most authors have focused on commercial real estate derivatives (Fisher, Geltner, & Webb, 1994; Fisher, 2005; Geltner & Fisher, 2007; Clayton, 2007; Berk, 2016; Tunaru & Fabozzi, 2017). This market seems to be more advanced; however, this does not mean that residential real estate derivatives are not the subject of research. Shiller (2008) has presented important research in this area. He was the first to consider perpetual futures on residential property indices in 1993. The research was conducted in collaboration with Case (Case, Shiller, & Weiss, 1993; Case & Shiller, 1996) and Weiss (Case, Shiller, & Weiss, 1993; Shiller & Weiss, 1999).

The real estate derivatives market is mainly led by the United Kingdom and the United States, but the history of property derivatives in the US is far shorter. At the beginning of its existence, the property derivatives market was characterized by rare activity and occasional transactions (Venter, 2007). Futures were the first real estate derivatives to be introduced into public trading on the London Futures and Options Exchange (FOX) on May 9, 1991. Syz (2008) underlines that the commercial property derivatives market started as a brokered market, while residential property derivatives were intermediated by a risk-taking institution, such as Santander Global Banking &

Markets. Table 1 illustrated when the use of derivatives on the real estate market began.

The reasons for the faster development of real estate derivatives in the UK can be found in the following areas. One of these is the reduced geographical fragmentation. It contributes to lower basis risk and the possibility of more effective hedging. There has been a favorable investment environment for property. In contrast to the US where Real Estate Investment Trust (REIT) has existed since 1961, the UK had limited investment opportunities (Fabozzi, Shiller, & Tunaru, 2012). It was necessary to develop property investment indices that allowed property derivatives to be structured relatively simply.

Furthermore, some important regulatory changes were in the UK, which significantly impacted the development of the real estate derivatives market. The former Financial Services Authority (FSA) in 2002 allowed life insurance companies owning the majority of commercial real estate in the UK to include real estate swaps and forwards as admissible assets in the computing of their solvency ratios. Inland Revenue made a further change in 2004. It standardized the taxation of property derivatives and allowed losses from the use of derivatives to be offset against capital gains.

It is worth noting that before the financial crisis, twenty-one investment banks in the UK had acquired licenses to use Investment Property Databank (IPD) indices to offer property derivatives. These were mainly property total return swaps with a nom-

**Table 1.** The overview of the introduction of real estate derivatives

Source: Own study.

Country	Date of first trade	Place of trade	Underlying asset
United Kingdom	May 1991	London Futures and Options Exchange (FOX)	Investment Property Databank (IPD) indices: capital growth index and rental growth index Nationwide Anglia House Price (NAHP) Index, Mortgage Interest Rate (MIR) Index
	1999	Over-the-counter	Halifax House Price Index
United States of America	January 1993	Over-the-counter Property swap intermediated by Morgan Stanley between two counterparties	NCREIF Property Index (NPI) NCREIF – the National Council of Real Estate Investment Fiduciaries
	May 2006	Chicago Mercantile Exchange (CME)	S&P/Case–Shiller Home Price Index
	October 2007	Chicago Mercantile Exchange (CME)	S&P/GRA Commercial Real Estate Index (S&P/GRA CREX) GRA – Global Real Analytics
	September 2007	Over-the-counter	Residential Property Indices (RPX)
Switzerland	February 2006	Over-the-counter Executed by the Zuercher Kantonalbank (ZKB)	Zuercher Wohneigentumsindex (ZWEX)
Hong Kong	November 2006	Over-the-counter The brokerage services: GFI Colliers (Colliers International and interdealer broker GFI)	Hong Kong University–Hong Kong Residential Price Index (HKU–HRPI)
France	December 2006	Over-the-counter Executed by Merrill Lynch and AXA Real Estate Investment Managers	The index on French commercial property run by the London-based Investment Property Databank
Germany	January 2007	Over-the-counter The intermediary: Goldman Sachs	German IPD/ DIX Index
Australia	May 2007	Over-the-counter Executed by Grosvenor and ABN AMRO	Property Council/IPD Australian Property Index
Japan	July 2007	Over-the-counter Executed by Grosvenor and Royal Bank of Scotland	The monthly IPD Japan Property Index
Italy	October 2007	Over-the-counter Executed by Grosvenor and BNP Paribas	IPD Italian Property Index

inal value of £3.5 billion in the first quarter of 2008 (Ghent, Torous, & Valkanov, 2018).

The possibility of using real estate derivatives is also closely linked to indices related to the property market. The derivatives market's growth is closely related to the ability to design instruments based on market indices (Millo, 2007). The existence of a clear and respectable index that accurately reflects the changes in the real estate market is a very important component. Deng and Quigley (2008) have rightly argued that the development of reliable and replicable indices of housing prices is the key to trading in property derivatives. Creating such an index for properties is difficult due to their heterogeneity (each property has a unique location, structural characteristics, etc.). Therefore, property indices can be classified according to various criteria. The most significant dimensions are the type of property and geographical expansion. Geltner, Miller, Clayton, and Eichholtz

(2001) distinguish between owner-occupied residential housing, residential apartment renters, retail, office, industrial, and hotel and convention. It should be stressed that each index may require different conceptual bases.

## 2. RESULTS

The development of all new financial instruments is closely related to the national financial system. Its stability and the level of development of the financial market are prerequisites for the smooth introduction of new financial products. The environment for developing real estate derivatives in Poland is presented in terms of the most important macroeconomic indicators and stock exchange development. The real estate market situation in Poland is also presented with special attention to the property index as a potential underlying asset in real estate derivatives.

**Table 2.** Selected macroeconomic indicators of the Polish economy

Source: Own study based on World Bank data and OECD data.

Indicators, %	2014	2015	2016	2017	2018	2019
Real GDP growth rate (%)	3.32	3.84	3.06	4.81	5.15	4.15
Average CPI inflation rate	0.05	-0.87	-0.67	2.08	1.81	2.23
Investment (GFCF) annual growth rate (%)	10.03	6.13	-8.16	3.97	9.35	7.17
Investment – dwellings (% of GFCF)	15.4	12.7	13.3	12.5	10.4	10.5
Domestic credit to private sector (% of GDP)	52.3	53.6	54.5	52.5	52.6	51.1
Current account balance (% of GDP)	-2.098	-0.557	-0.521	0.114	-0.991	0.469
External balance on goods and services (% of GDP)	1.441	3.093	4.036	4.182	3.428	5.258

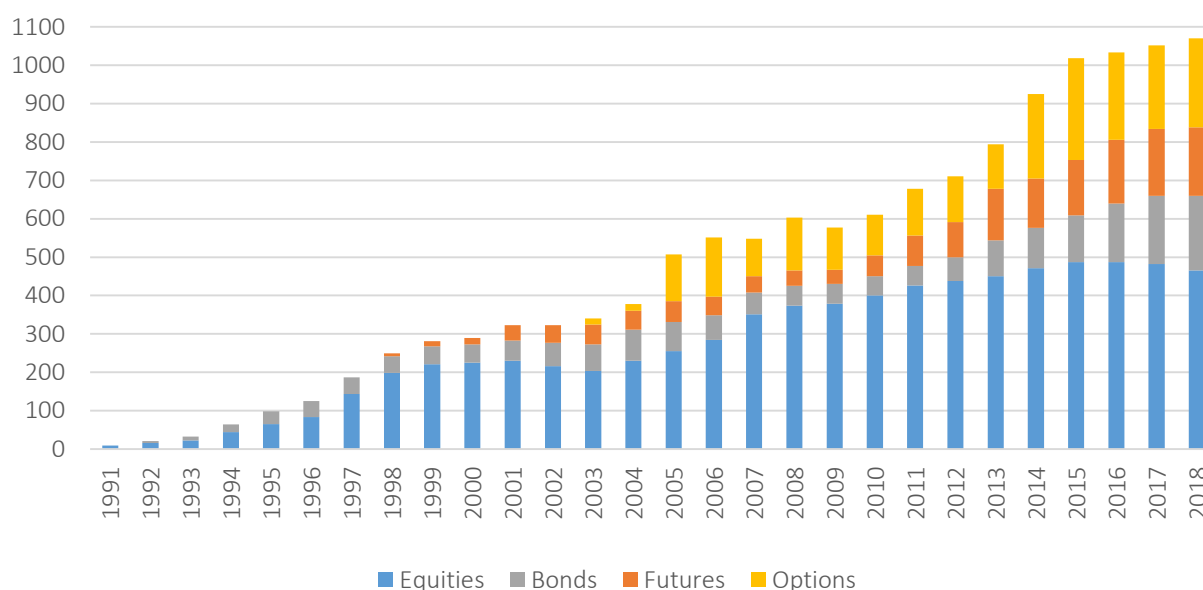
The financial market has been developing in Poland since the early 1990s. After historical changes in 1989, this was possible when the new government system was introduced (Polanski, 2002). It was difficult to develop the financial market before that time due to the lack of democratic institutions at all levels. Nowadays, Poland's financial system functions stably and is supported by the domestic economic environment that exhibits no major imbalances (NBP, 2018). Table 2 presents the macroeconomic performance of the national economy.

The Polish economy continues to show stable development. Real GDP growth reached 4.15 percent in 2019. It is mainly driven by last year's in-

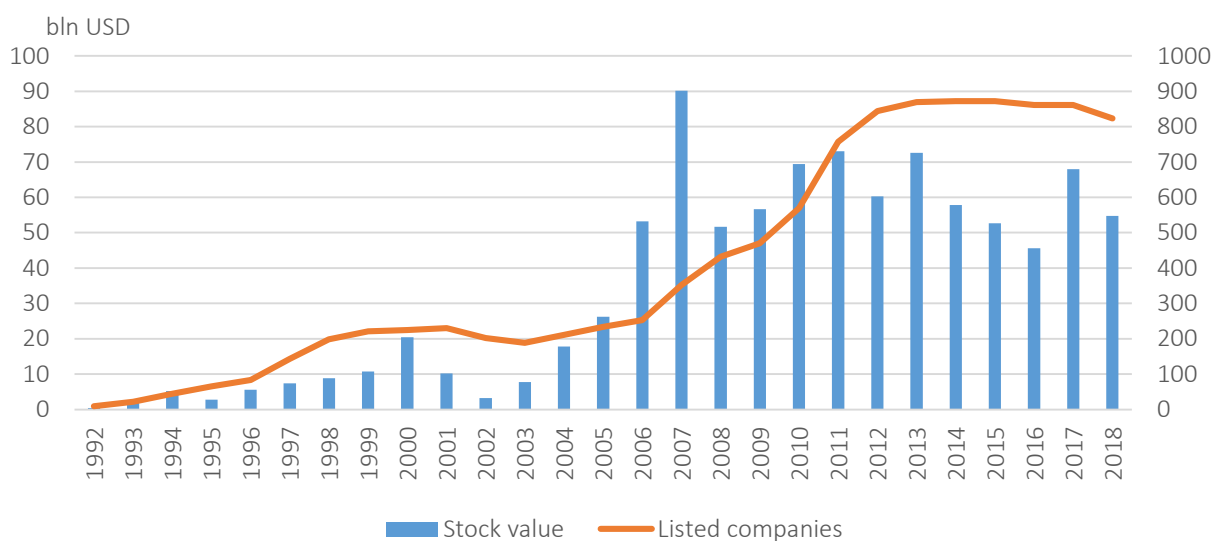
vestments and domestic consumption. A different situation is observed regarding investments in residential property. The annual growth rate has declined in recent years, and in 2018, it was more than two times lower than in the European Union.

Apart from financial institutions, including banks, which play a crucial role in financing the economy and settling payments, stock exchange also supports economic growth and financial instruments development. In Poland, the stock exchange has been operating for 28 years. Since the establishment of the Warsaw Stock Exchange (WSE) in April 1991, the domestic financial market has become increasingly liquid and offered a growing range of oppor-

Source: Own study based on WSE data.

**Figure 1.** Instruments traded on WSE in 1991–2018

Source: Own study based on World Bank data.



**Figure 2.** Stocks traded value and number of listed companies on WSE in 1992–2018

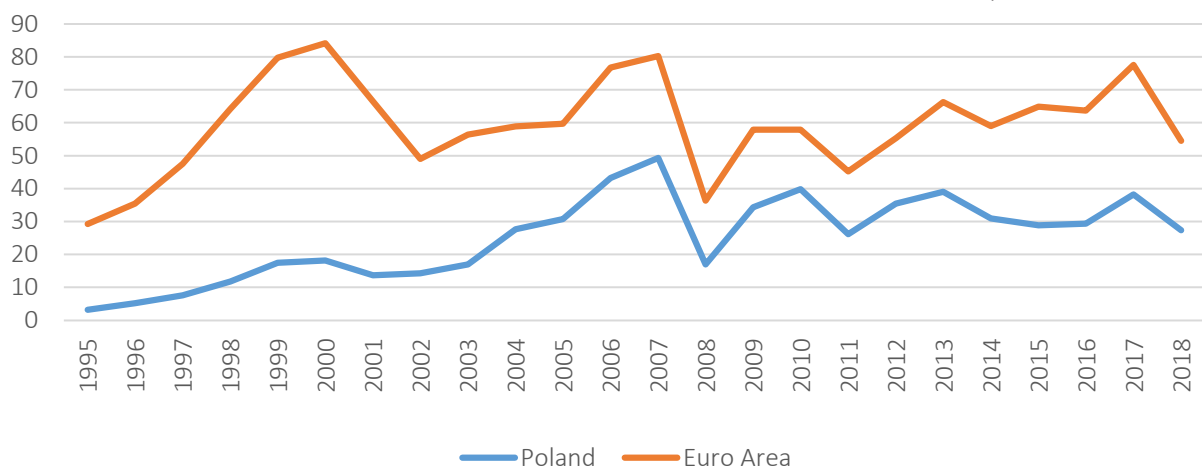
tunities to use various instruments. Nowadays, the WSE is the largest exchange for financial instruments in Central and Eastern Europe (CEE). It should also not be overlooked that a progressive integration of the domestic financial market with the international financial market widens access to the new financial products. WSE plays an important role in this matter, which is why it would be worthwhile to evaluate its development. The following figures show the selected categories.

Today, the WSE offers two types of derivatives: futures and options. There are several futures where the underlying assets are: index, stock, currency, treasury bonds futures, and WIBOR. WIG20 fu-

tures are still the most popular. At the end of 2018, there were over 130 thousand open interests, almost ten times more than for options. Currently, only index options are available, which were introduced on the WSE in 2003. Figure 1 shows that the position of derivatives on the Polish Stock Exchange is gradually strengthening. As has already been mentioned, real estate derivatives do not exist in the Polish capital market, so there is no data.

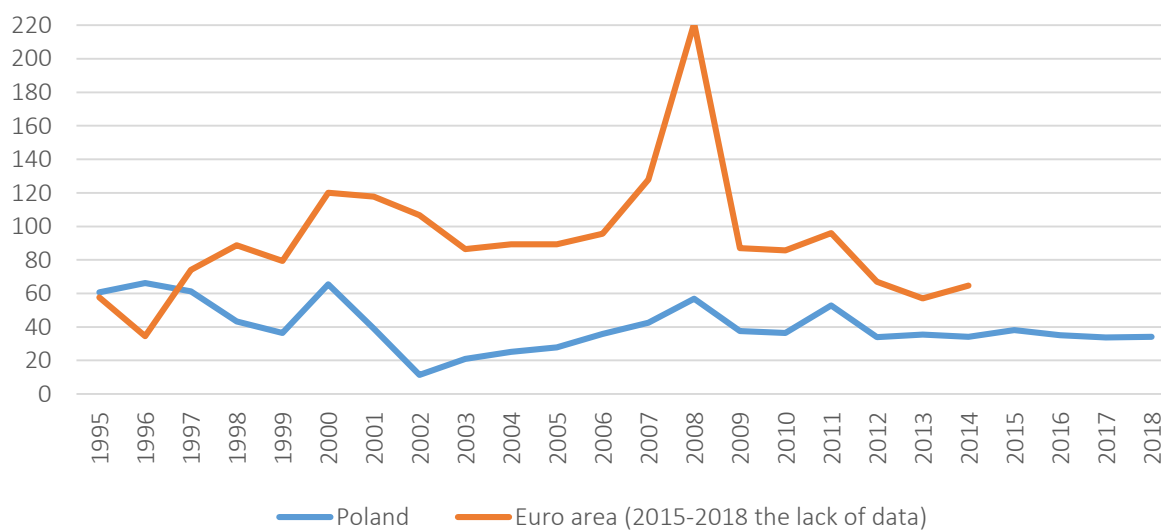
The capitalization of the WSE had been growing systematically until 2007 when it reached its highest value (Figure 3). It was found that, in general, the capitalization of the WSE is similar to that of the Euro area, although its level, measured as % of GDP, has

Source: Own study based on World Bank data.



**Figure 3.** Market capitalization of listed domestic companies (% of GDP)

Source: Own study based on World Bank data.



**Figure 4.** Turnover ratio of domestic shares (%) in 1995–2018

remained around twice lower over the past ten years.

Figure 4 shows a turnover ratio, which is one of the measures of stock liquidity. As far as the liquidity ratios for derivatives are concerned, large differences can be observed when futures and options are taken into account (Figure 5).

The lowest liquidity is recorded for options. The liquidity ratio oscillates around 7% during the period analyzed, while the average value for futures was 150%.

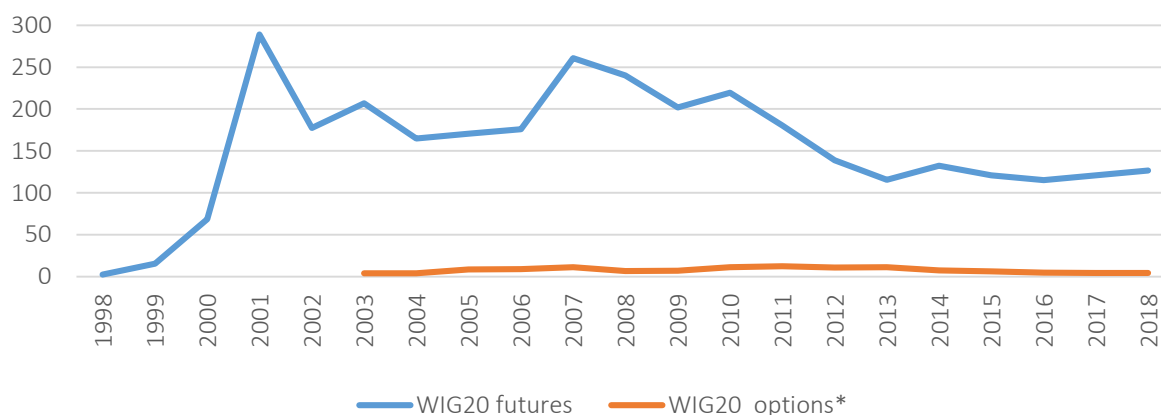
In addition to the state of the financial system and the stock exchange development, the real es-

tate market situation is also of great importance. Poland's real estate market as a basis for the development of property derivatives should be considered in connection with the value of the property market, existing real estate indices, and the legal and tax aspects of investments. Due to its specific nature, the latter aspect will only be presented in general terms.

Table 3 presents the value of the market concerning residential and commercial properties.

The value of the real estate market in Poland reaches slightly more than PLN 4 trillion. As shown in Table 3, the commercial real estate market has

Source: Own study based on WSE data.



Note: \* the first trading session was in 2003.

**Figure 5.** Liquidity ratio for derivatives (%) in 1998–2018



**Table 3.** Estimated value of property in Poland in 2014–2018

Source: Own study based on NBP data.

Estimated value of property		2014	2015	2016	2017	2018
Residential	Trillion PLN	3.1	3.11	3.17	3.25	3.8
	% of GDP	176	173	171	170	184
Commercial	Trillion PLN	0.2	0.2	0.2	0.24	0.25
	% of GDP	11	11	12	12	12

**Table 4.** Prime yields in selected European cities in 2017–2018

Source: EY (2019).

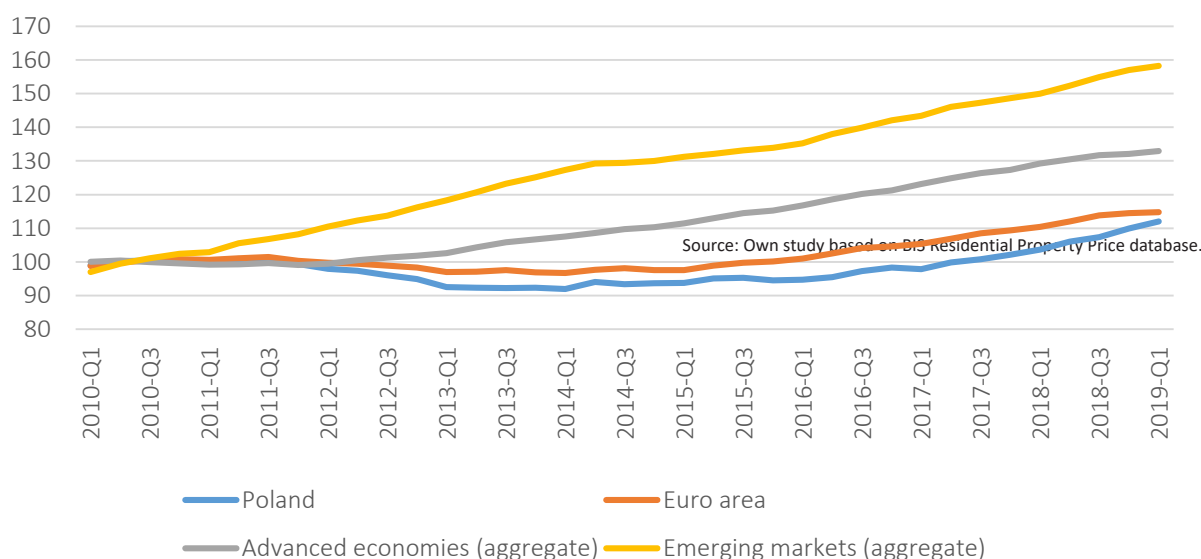
City	Office		Retail		Warehouse	
	2017	2018	2017	2018	2017	2018
Amsterdam	3.5%	3.3%	2.8%	2.8%	4.8%	4.7%
London	3.7%	3.7%	2.1%	2.3%	3.7%	3.7%
Paris	3.1%	3.1%	2.8%	2.8%	5.6%	4.7%
Madrid	3.6%	3.4%	3.3%	3.3%	5.6%	5.6%
Milan	3.8%	3.6%	3.3%	3.5%	5.7%	5.8%
Stockholm	3.6%	3.4%	3.7%	3.7%	5.2%	5.3%
Warsaw	5.1%	5.0%	5.0%	4.9%	6.6%	6.5%

a much smaller market share, but it offers more attractive yields than those found in Western European markets. Table 4 presents prime yields in selected European cities.

of return is for retail properties. The rate of return remained stable in Warsaw and other European cities. No significant changes were recorded in 2017 and 2018.

Top yields on three types of commercial properties are higher in Warsaw compared to other Western European cities. The biggest difference in the rate

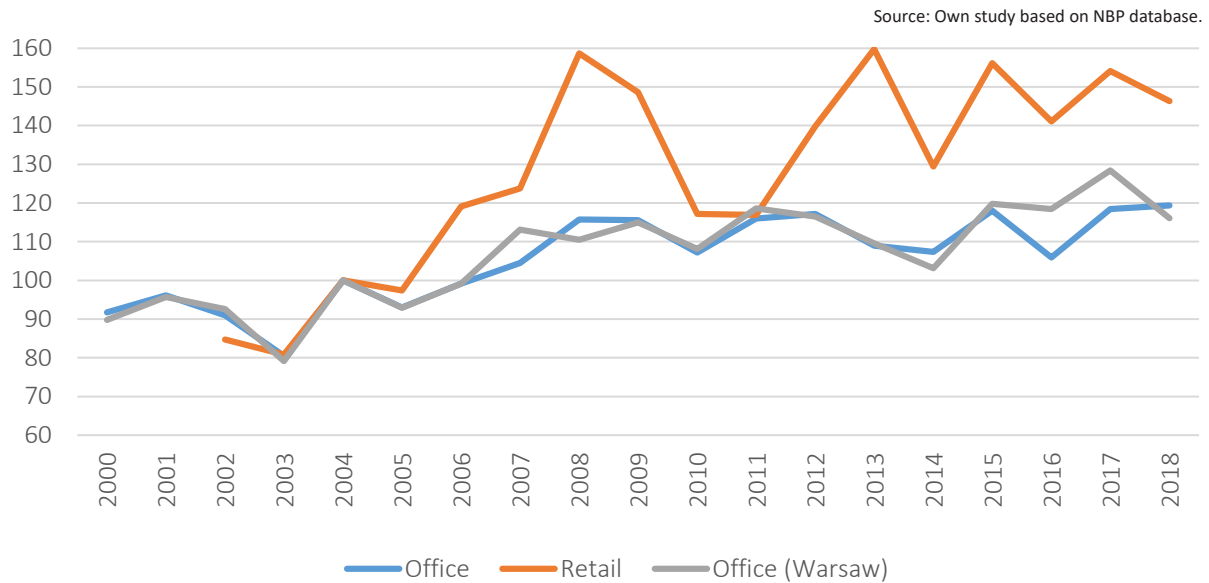
As mentioned earlier, the existence of the transparent index is very important when implementing derivatives. Regarding Poland, more



*Note:* Advanced economies: Australia, Canada, Denmark, Euro area, Iceland, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States. Emerging markets: Brazil, Bulgaria, Chile, China, Colombia, Croatia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Israel, Korea, Macedonia FYR, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, Serbia, Singapore, South Africa, Thailand, Turkey, and the United Arab Emirates.

**Figure 6.** Index for quarterly residential property prices selected in Q1-2010–Q1-2019





**Figure 7.** The office and retail price index (2004 = 100) in 2000–2018

indices cover residential property. Figure 6 presents the index for the selected nominal residential property prices (2010 = 100) in Poland and the Euro area.

As for commercial properties in Poland, the indices include office and retail premises. They are collected at annual intervals. However, no aggregated indicator covering all commercial properties is available in Poland. The office and retail price index for the whole country and Warsaw are shown in Figure 7.

### 3. DISCUSSION

Based on the previous section's data, one can conclude that there is a sufficient environment for the development of real estate derivatives in Poland. Poland's economic indicators show that it can be classified as a country with a medium level of financial development. The Polish economy's strength can be attributed to the large domestic market and the growth in investment activity. Nevertheless, investment in residential real estate is limited.

The macroeconomic situation has a common interest in the financial system. There are clear indications of the relationship between financial market development and economic growth. The studies are usually conducted in two configurations. The first category includes studies on many economies (e.g., Demirgüç-

Kunt & Levine, 1996; Demetriades & Hussein, 1996; Arestis, Demetriades, & Luintel, 2001; Beck & Levine, 2004; Calderón & Liu, 2003; Ruiz, 2018; Ibrahim & Alagidede, 2018). The second group focuses on examining a single country case (e.g., Yang & Yi, 2008; Ofori-Abebrese, Pickson, & Diabah, 2017; Ono, 2017; Ananzeh & Othman, 2019; Škare, Sinković, & Porada-Rochoń, 2019; Nguyen & Bui, 2019).

For many years, it has also been known that financial assets traded on the stock markets are less risky (Levine, 1991; Bencivenga, Smith, & Starr, 1996). Therefore, the development of the derivatives market is important for the article. In the literature (Cooper, Groth, & Avera, 1985; Levine & Demirgüç-Kunt, 1999), the following market development measures are used: the number of listed instruments, stocks traded value, market capitalization, and liquidity. Nowadays, 1,070 different instruments are listed on the WSE, including equities, bonds, futures, and options. The first derivatives were introduced on the Warsaw Stock Exchange in 1998 when the WIG20 futures started to be listed. Initially, their share was only 3% of the traded instruments, but it began to grow systematically from year to year, and it has remained at the level of about 40% for the last five years.

Unfortunately, the market lacks liquidity. The turnover ratio results indicate that the stock liquidity on the WSE is still lower than in the Euro area (Figure 4). The difference is even higher than

countries like the USA, the United Kingdom, and Japan, where turnover ratios reach over 100%. In the case of Poland, it has fluctuated around 35% since 2012. The situation is different for the futures. The liquidity ratio was below 100% only in the first three trading years (Figure 5). The results obtained confirm that WIG20 futures are the most popular derivative instrument in Poland and the most traded stock index futures of Central and Eastern Europe. The popularity of the WIG20 futures did not even decrease during the financial crisis. This could be because investors used them as tools to cover the market risk.

The results for the state of the Polish real estate market show that it is the leader in the CEE region in terms of size, range, and investor confidence. It remains strong due to good economic performance and a well-developed financial market. In Poland and the world, the real estate market is the most significant source of wealth. In Poland, the value of residential and commercial property accounts for almost twice the Polish GDP. It covers approximately 55% of the capital assets in the economy. Since the transformation period in Poland, there has been a continuous increase in residential assets. This contributes to the higher economic importance of these assets. However, the Polish market still lags behind the Western EU in terms of ownership structure (with a predominant share of housing stocks occupied by their owners), an undeveloped institutional rental market, age of housing stocks, and the degree of market saturation (EY, 2019).

The latter of the presented results refer to property indices. As one can see in Figure 6, the Polish market's tendency is similar to the Euro area. It is worth mentioning that there are also many indices with geographical focus. There are two categories in terms of geographical location: urban and rural indices or local and national indices (Syz, 2008). A hedonic house price index is one of these in Poland. It is calculated for 16 largest cities, where a significant proportion of market transactions are created.

In addition to direct residential and commercial indices, there are indices covering assets related to the property market. The assets include property companies, real estate funds, Real Estate Investment Trust (REIT). The WIG real estate index is the only one listed on the Polish Stock Exchange. It currently comprises 29 companies<sup>2</sup> belonging to the real estate sector. The main advantage of using them as underlying assets for derivatives is their public listings and market valuation. Nonetheless, they do not strictly relate to property prices and are not substitutes for property prices indices. A proposed bill introducing the Real Estate Investment Trust (REIT) to the Polish legal system may significantly impact the development of the real estate derivatives market. As investment in commercial assets usually yields a higher return rate than investing in residential assets, the project should take this into account to attract potential investors.

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## CONCLUSION

The real estate derivatives are new instruments that are only available in some developed countries with a smoothly functioning financial market and well-reported property market. The analysis of the Polish economy's situation and the financial market concludes that there are sufficient conditions and opportunities for the development of real estate derivatives in Poland. The economic environment remains stable, and the financial system does not show major imbalances. This is also confirmed by the fact that FTSE Russell promoted Poland from an advanced emerging market to a developed market (FTSE Russell, 2017). The developed market status was put into effect after a semi-annual review in September 2018 (FTSE Russell, 2018). Poland has also been classified as a developed market by Stoxx. The reclassification of the Polish capital market acknowledges the progress of the Polish economy and the financial market. It can be a step forward in the development of the real estate derivatives market. Furthermore, the Polish real estate market is recognized as the

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2 Status as of November 2019. The number of companies is variable.

top-rated market in Central and Eastern Europe for the transparency<sup>3</sup>. Poland was in the 20th position among all countries in 2018. Transparency is especially important in introducing new instruments. Transparent and liquidity markets are more likely to attract cross-border investors.

The major problem for introducing property derivatives on the Polish market seems to be the existing proper underlying assets. There are not many indices of the property market, especially for the commercial property market, which also requires education and acceptance actions. The idea of derivatives as instruments to gain exposure to property is still relatively unknown in Poland. Unfortunately, only one index referring to the property market is quoted on the stock exchange. Underlying instruments should have a large group of potential users. Creating a real estate derivatives market also requires actions related to the introduction of new regulations.

Establishing a real estate derivatives market also requires actions related to education and acceptance. The idea of derivatives as instruments to gain exposure to property is still relatively unknown in Poland. Both traditional property investors and all potential market participants should be educated about property risk awareness, understanding prices and volatility for new instruments, and their structure.

## AUTHOR CONTRIBUTIONS

Conceptualization: Agnieszka Majewska.  
 Data curation: Agnieszka Majewska.  
 Formal analysis: Agnieszka Majewska.  
 Funding acquisition: Agnieszka Majewska.  
 Investigation: Agnieszka Majewska.  
 Methodology: Agnieszka Majewska.  
 Project administration: Agnieszka Majewska.  
 Resources: Agnieszka Majewska.  
 Supervision: Agnieszka Majewska.  
 Validation: Agnieszka Majewska.  
 Visualization: Agnieszka Majewska.  
 Writing – original draft: Agnieszka Majewska.  
 Writing – review & editing: Agnieszka Majewska.

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