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A STUDY OF THE FACTORS AFFECTING THE REAL ESTATE MARKET WITH A MACROECONOMIC CONTEXT

NATIA TERTERASHVILI

Student, Doctoral Program of Business Administration, Ivane Javakhishvili Tbilisi State University. Tbilisi, Georgia. Email: Natiaterterashvili0@gmail.com, ORCID ID: 0009-0009-5191-5036

SHOTA SHABURISHVILI

Associate Professor, Doctor of Economics, Ivane Javakhishvili Tbilisi State University. Tbilisi, Georgia. Email: shota.shaburishvili@tsu.ge, ORCID ID: 0000-0001-8091-7684

Abstract

The investigation into the patterns of real estate market development, its role in the economic landscape, and the examination of factors influencing property prices captivates the attention of contemporary academia. Notably, the real estate market in Georgia remains in its formative stages, resulting in limited scholarly scrutiny. It's essential to recognize that the real estate market wields a potent multiplier effect on the overall economy of a nation. This article delves into a comprehensive analysis of the factors that exert influence on the real estate market. The study encompasses the timeframe from 2013 to 2021, drawing upon indicators from 12 different countries. Employing the method of linear regression analysis, the study successfully identifies the key variables that significantly impact real estate prices and availability. These variables include GDP per capita, inflation, investments, the Quality of Life Index, and the safety index. Crucially, through empirical research, the study unveils statistically significant relationships. Specifically, GDP per capita, safety index, and investments exhibit a positive correlation with real estate prices and its affordability ratio. Conversely, the analysis reveals a negative correlation between the Quality of Life Index, population, inflation rate, and the dependent variable, underscoring the intricate interplay between these factors and their influence on the real estate market dynamics.

Keywords: real estate; housing market; linier regression; construction industry; investments.

JEL Code: M10; M21; O11

INTRODUCTION

The trajectory of the real estate market serves as an indicator of the local economy's robustness (Zinchenko, Finahina, Pankova, Buriak, & Kovalenko, 2021). The market's dynamics are influenced by a network of interconnected variables, and it experiences price fluctuations, some of which remain beyond control or even unidentified (Baldominos, et al., 2018). Numerous factors contribute to the escalation of house prices and the real estate market, rendering trend prediction a challenging endeavor (Hu, Hu, Fan, & Lin, 2021). It's important to note that the housing market departs from conventional product markets since real estate not only serves its fundamental purpose but also functions as an asset, capable of accruing and augmenting value over time, alongside generating income through rent.

The undulations in house prices reverberate across the business cycle's dynamics and the financial system's performance. Consequently, the housing market's activity is regarded as a potential gauge of economic vitality.

The Seybold Report
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In the United States, the real estate sector plays a pivotal role in steering economic growth. Building permits, or the count of new construction projects initiated within any given month, as disclosed by the US Census Bureau, stand as a critical benchmark of a country's economic stability.

Evidently, the construction industry stands as one of the world's most active sectors, wielding substantial influence over a nation's economic landscape. In developing countries, the expansion of the construction sector not only spurs the growth of allied industries but also bestows favorable impacts on agriculture, transportation infrastructure, employment figures, and more. The growth of this industry generates increased job opportunities, a particularly significant facet for economies in the developmental stage, such as Georgia (Zurashvili, 2018).

LITERARY ANALYSIS

Numerous studies employ various real estate-related indicators to assess the state of the real estate market (Renigier-Biłozor, et al., 2022). Nevertheless, pinpointing the factors that impact real estate is intricate and multifaceted. Many variables influencing the real estate market remain to be fully comprehended and analyzed (Yang, Lee, & Lin, 2022).

Sabyasachi Tripathi's study in 2019, which explored the macroeconomic determinants of house prices, identified key variables such as rent, price-income ratio, price-rent ratio, urbanization, GDP per capita, inflation, GDP growth, and real exchange rate. Based on analysis of data from 43 countries, the research found that the money supply and real exchange rate positively and significantly affect real house prices. Conversely, the percentage of service sector employment negatively impacts real house prices, while the real interest rate exhibits no effect (Sabyasachi, 2019).

Leung (2004), also investigated the long-term interplay between the housing market and macroeconomic variables. Fluctuations in house prices influence business cycle dynamics and financial system performance. Consequently, housing market activity serves as a potential gauge of economic activity, although it also harbors the potential for financial crises and banking sector vulnerabilities. While rising house prices bolster consumer spending and economic growth, they adversely affect those without housing. Notably, in 2018, 35% of the United States population remained without homeownership (statista, 2023).

Belke and Keil's (2018) study scrutinized the fundamental determinants of real estate prices across 100 German cities. Their findings highlighted the significance of construction activity, housing supply factors, and demand factors like apartment rents, market size, age distribution, local infrastructure, and rental prices.

Cohen et al. (2017) conducted an analysis of the impact of GDP, unemployment, inflation, interest rates, emigration, and macroprudential policy measures on house prices in Lithuania from 2001 to 2014. Employing a Granger causality test, the study concluded that inflation, interest rates, and immigration are not causal determinants of average housing prices.

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Zhang et al. (2012), using a nonlinear autoregressive moving average with exogenous inputs (NARMAX) model, determined that mortgage rates, producer prices, money supply, and real effective exchange rate have the most substantial impact on housing price dynamics in China.

Hossain and Latif (2009), employing generalized autoregressive conditional heteroscedastic (GARCH) and vector autoregressive (VAR) models, ascertained that house price volatility is significantly influenced by GDP growth rate, house price growth rate, and inflation in Canada.

In the context of residential real estate, the connection between GDP growth and real estate return on equity arises from the need to accumulate income to afford a home, with income directly stemming from GDP (Asia green real estate, 2022).

GDP stands as a crucial element for evaluating the overall economy, significantly influencing the demand and pricing of private residential real estate (Hui, 2003). Numerous other studies reveal a strong correlation between GDP and the housing market, with GDP growth having a notable impact on the housing sector (Adams, 2010).

Research across Asia, Europe, and the United States demonstrates that median home prices correlate between 60% and 95% with GDP per capita. Long-term trends in growth align between both cycles, though high correlation between GDP and real estate prices isn't constant, and other determinants like urbanization, construction, and demographic shifts play a role (Asia green real estate, 2022)

Tsatsaronis and Zhu (2004) found, through variance decomposition across 17 industrialized countries, that the long-run contribution of GDP to housing price variation is limited to 10%.

Several studies, including Davis (2005), Iacoviello (2010), Goodhart (2008), Madsen (2012), and Cerutti (2015), concur on a strong short-term relationship between the housing market and GDP.

A deficiency in relevant knowledge regarding business planning and expansion is a factor contributing to unsuccessful activities (Udesiani & Shaburishvili, 2023). In sum, GDP can serve as a viable measure for gauging progress in the residential and commercial real estate market In the current investment landscape, real estate garners increasing attention as an asset class. While illiquidity is a consideration, global real estate offers stability, long-term income, capital growth potential, and substantial diversification benefits. This is particularly pronounced in Asian countries marked by consistent structural, long-term, and sustainable economic growth (Asia green real estate, 2022).

Amidst the COVID-19 era, real estate investment emerges as a secure option for both small and large investors. This makes real estate an attractive prospect for private individuals, corporations, developers, and institutional investors alike. Notably, the valuation of real estate is influenced by myriad individual factors including technical, economic, and social considerations (Hromada & Krulický, 2021).

According to Ivanov and Faulkner's (2020) research, the ownership of real estate is shifting from rental arrangements to large corporate ownership, diverging from prior perceptions favoring leasing. Lekander (2015) discussed real estate investing, highlighting its sensitivity to

The Seybold Report
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local factors rather than global ones.

While Follain (1982) and Feldstein (1982) suggested that inflation negatively affects housing demand and investment, Andrews (2010) noted dual trends in housing prices following inflation changes. Conversely, Nielsen and Sorensen (1994) indicated that higher inflation deters housing investment due to decreased real after-tax consumer value.

Diverse views persist on the actual impact of inflation on housing, with earlier studies suggesting that inflation leads to decreased housing demand and investment due to uncertainty ((Kearl, 1979); (Follain, 1981); (Feldstein, 1982). Yet, subsequent studies like Nielsen and Sorensen (1994) argue for a positive correlation between inflation and housing prices (Nielsen & Sorensen, 1994).

King (2017) asserted that a third of urban dwellers worldwide lack access to secure housing, particularly acute in low- and middle-income countries. This underscores the importance of addressing housing urbanization and affordability, particularly in developing nations.

Higher standards of living often lead to increased demand for better housing, which can drive up real estate prices in desirable locations. This is because people with higher incomes are generally willing to pay more for properties that offer better amenities, quality, and location.

Research has shown that areas with a higher quality of life, including better healthcare, education, safety, and access to amenities, tend to attract more people, driving up demand for housing and subsequently impacting real estate prices. A study by Eng, Mok, and Zhang (2002) found that housing prices tend to be higher in cities with better amenities and quality of life indicators.

Real estate prices can also be influenced by investor sentiment, especially in areas perceived to have a high standard of living. Investors often flock to markets they believe will provide strong returns over time, which can further contribute to price increases.

External factors such as government policies, interest rates, and macroeconomic conditions can also influence the connection between the standard of living and real estate prices. For instance, low interest rates can make housing more affordable, even in areas with high standards of living.

Overall, the relationship between the standard of living and real estate prices is complex and multifaceted. While higher standards of living can contribute to increased demand and subsequently higher real estate prices, this relationship can be influenced by a range of factors including local economic conditions, supply and demand dynamics, and broader macroeconomic trends.

RESEARCH METHOD

The study adopts a sophisticated research approach, primarily relying on the linear regression analysis method to establish connections between variables. In the initial phase of the research, pertinent literature and statistical data were acquired. Through online resources, reports, manuals, and research data from state bodies and international organizations were sourced.

The Seybold Report
ISSN 1533-9211
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Additionally, a comprehensive collection, analysis, and synthesis of scientific articles and literature were conducted.

The study aims to identify the factors influencing real estate prices, specifically focusing on GDP per capita, inflation, foreign investments, the standard of living index, and the security index. To establish these correlations, the linear regression analysis method was employed, and the calculations were executed using the Microsoft Excel computer program. Regression analysis constitutes a suite of statistical techniques utilized to examine the impact of one or more independent variables on the dependent variable.

Linear regression generally looks like this:

$y = a_0+a_1x_1+a_2x_2+\ldots a_nx_n$

In the equation, "y" represents the dependent variable, "x" stands for the independent variable, "a" signifies the regression coefficients that ascertain the significance of the factors, and "n" corresponds to the count of factors being considered.

As we mentioned, depending on the objectives of the research, it is necessary to determine the relationship between the variables, whose data for 2013-2021, including 12 countries, are given in Table N1 of the Appendix. The data is taken from the World Bank (2023), OECD (2023), and Numbeo databases (2023).

In our analysis, we selected Price to Income Ratio as the dependent variable (Y), which serves as the primary indicator of apartment affordability. This ratio is commonly computed as the median house prices divided by the median household disposable income, usually expressed in years. A rising price-to-income ratio indicates a decrease in real estate affordability, whereas a declining ratio signifies an improvement in real estate affordability (Numbeo, 2023).

As for the independent variables, let's explain each separately:

“x1“ - gross domestic product per capita,

“x2“- population,

“x3“ – Inflation rate

“x4“ - Quality of Life Index

“x5“ - safety index

“x6“ - foreign direct investmant, net inflows

And "n" represents the number of the factor, which in our case is equal to 100.

The Seybold Report
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RESEARCH RESULT AND DISCUSSION

Table 1: Linear regression model parameters

Regression Statistics								
Multiple R	0.794226							
R Square	0.630795							
Adjusted R Square	0.606975							
Standard Error	2.899484							
Observations	100							
ANOVA								
	Df	*SS*	*MS*	*F*	*Significance F*			
Regression	6	1335.808	222.6347	26.48205	3.55E-18			
Residual	93	781.8516	8.407007					
Total	99	2117.66						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.659274	2.077854	0.798552	0.426585	-2.46693	5.785481	-2.46693	5.785481
GDPpc_	4.48E-05	2.18E-05	2.052447	0.042936	1.46E-06	8.82E-05	1.46E-06	8.82E-05
POPulation	-1.3E-08	1.36E-08	-0.95456	0.342273	-4E-08	1.4E-08	-4E-08	1.4E-08
INFL	-0.22543	0.183612	-1.22774	0.222641	-0.59005	0.139188	-0.59005	0.139188
Quality of Life Index	-0.09086	0.010831	-8.38962	5.17E-13	-0.11237	-0.06936	-0.11237	-0.06936
safety index	0.312862	0.034588	9.04548	2.14E-14	0.244177	0.381546	0.244177	0.381546
Foraign direct investmant, net inflows	1.18E-13	4.07E-12	0.028876	0.977026	-8E-12	8.2E-12	-8E-12	8.2E-12

As evident from Table 1, the correlation coefficient Multiple R is 0.794226, indicating a strong relationship established by the model between the provided explanatory variables and real estate prices. Multiple R quantifies the strength of the linear relationship, with 1 signifying a perfect positive connection and 0 representing no relationship among the variables. In line with prior studies, a coefficient exceeding 0.5 generally affirms the relationship between the explanatory variables and the dependent Y variable.

The model's R Square, also known as the Coefficient of Determination, is 0.630795. This value reflects the proportion of data points that align with the regression line. For instance, a value of 63% implies that 63% of the variance in y-values is elucidated by x-values. In essence, 63% of the data points conform to the model.

The Adjusted R Square (0.606975) takes into account the number of terms within the model, refining the R-square value to adjust for its accuracy.

The Standard Error (2.899484) gauges the precision of the regression coefficient measurement, indicating the reliability of the regression analysis.

The number of Observations (100) denotes the total instances in the dataset, which in this case is 100.

The Seybold Report
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ANOVA

SS (Sum of Squares): This represents the sum of squared deviations between observed and predicted values.

Regression **MS (Mean Square):** Calculated as the Regression SS divided by the degrees of freedom for regression. It indicates the variance attributed to the regression model.

Residual **MS (Mean Square):** This is the mean squared error, derived from the Residual SS divided by the degrees of freedom for residuals. It reflects the average squared difference between observed and predicted values.

F (26.48205): This F statistic signifies the overall model fit and is computed as the ratio of Regression MS to Residual MS. It helps assess if the model explains variance significantly.

Significance F (3.55E-18): This value gauges the statistical significance of the entire regression model. In this case, it's less than 0.05, indicating that the explanatory variables hold a statistically significant association with the dependent variable (Price to Income Ratio).

Coefficients: The coefficients linked to each explanatory variable inform us about the average anticipated change in the response variable, under the assumption that the other explanatory variables remain constant. These coefficients quantify the strength and direction of the impact of each predictor variable on the dependent variable.

Also, the value of the coefficient that is positive with the following variables: GDP per capita, security index and volume of foreign investment describes a direct proportional relationship with the dependent variable Y, which means that the higher the value of each X variable, the higher the "y".

As mentioned, the Y variable is the ratio between real estate prices and income. An increase in the value of the Y variable means a decrease in real estate affordability, and a decrease in the Y variable means an increase in the affordability of real estate, ie if the price-to-income ratio increases, it means that real estate becomes less affordable. - Within the framework of our research, this means that the gross domestic product per capita is directly proportional to the price of real estate, that is, it increases the price and reduces the availability of real estate.

We can also explain the impact of the safety index , inflation and Investment with the real estate price and its availability. An increase in the security index and the volume of investments will increase the price of real estate and also increase the affordability ratio. An increase in the affordability ratio means a decrease in the affordability of real estate. The coefficients of the remaining three variables - population, inflation and quality of life index - are negative. In our study, this means a negative correlation between the explanatory and dependent variables. If we follow the same logic, we will get that the increase in the population, inflation and the quality of life index - reduces the price of real estate and increases the availability of real estate.

P-values: The individual p-values serve as indicators of the statistical significance of each explanatory variable. In our study, the coefficients were found to be statistically significant for the following variables: GDP per capita, standard Quality of Life Index, and safety index.

The Seybold Report
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CONCLUSION

The construction industry stands as one of the most vibrant sectors globally, wielding substantial influence over a country's economy. Trends in the real estate market serve as a barometer for assessing the robustness of the local economy. Government officials and researchers play a crucial role in scrutinizing real estate data to uphold economic stability. Investigating and comprehending the macroeconomic factors that impact real estate prices holds paramount importance in formulating effective macroeconomic policies.

Given the intricate interplay among various variables and the susceptibility of the real estate market to fluctuations, the study of significant relationships is pivotal. Through a comprehensive literature analysis, noteworthy correlations were unearthed between key macroeconomic parameters, particularly between apartment selling prices and GDP, inflation, population, and standard of living.

We determined the mentioned connection using the method of linear regression analysis. The values of the variables are analyzed for the years 2013-2021 by including data from 12 countries. The research is mainly based on the reports, manuals and other research data of the state agencies and international organizations about the real estate market.

Within the framework of the research, a close relationship between explanatory variables and real estate prices was established. On the basis of empirical research, the following statistically significant relationships have been identified: - GDP per capita, safety index and investments are positively correlated with real estate prices and its affordability ratio. while the model revealed a negative correlation between the Quality of Life Index, population, inflation and the dependent variable.

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Appendix Table 1: Variables Used In The Regression Models

country	year	price income ratio (Y)	GDPpc (US dollar) - X1	POPulation-X2	INFL – X3	Quality of life Index-X4	safety Index-X5	foraign direct investmant, net inflows(US dollar) – X6
Georgia	2013	40.6	3738.70504	3717668	-0.5120584	11.9	80.4	1046562195
Georgia	2014	32.3	3902.568799	3719414	3.0688121	63.7	80.2	1836879043
Georgia	2015	15.2	4014.185944	3725276	4.0035782	60.7	78.6	1735285392
Georgia	2016	16.3	4128.385603	3727505	2.1349271	126.2	77.8	1659819993
Georgia	2017	12.3	4327.727585	3728004	6.0353173	124.4	80	1930381395
Georgia	2018	12.4	4539.087522	3726549	2.6152447	117.5	80.2	1304946394
Georgia	2019	12.7	4773.423309	3720161	4.8528982	118	80.2	1382476633
Georgia	2020	14.2	4447.664251	3722716	5.2024649	112.7	79.5	551844400.6
Georgia	2021	14.2	4927.064721	3708610	9.5669143	112.1	76.6	1267373916
Austria	2014	9.2	44245.16874	8546356	1.6058118	169.6	70.1	1712175274
Austria	2015	9.6	44195.81759	8642699	0.8965633	178.3	69.5	-7975773544
Austria	2016	9.5	44590.25163	8736668	0.8915918	196	72	-2.8939E+10
Austria	2017	9.7	45281.7234	8797566	2.0812691	195.8	78.2	13518864836
Austria	2018	9.6	46188.96651	8840521	1.9983798	188.6	77.4	-2.8606E+10
Austria	2019	10.1	46669.75121	8879920	1.5308956	193.1	77.4	-1.2394E+10
Austria	2020	10.9	43346.43185	8916864	1.3819106	184.5	77	-1.1667E+10
Austria	2021	10.4	45090.7589	8956279	2.7666667	185.8	74.7	12326601371
Belgium	2012	6	39975.57364	1.1E+07	2.8396634	83.7	43	11810272331
Belgium	2013	6.8	39970.3175	1.1E+07	1.1130959	136.3	46.2	-2.9641E+10
Belgium	2014	6	40421.42079	1.1E+07	0.3400028	115	48.7	-1.5206E+10
Belgium	2015	6.5	41008.29672	1.1E+07	0.5614292	111.7	47.1	-1.9514E+10
Belgium	2016	6.6	41318.01964	1.1E+07	1.9738526	152.1	45.5	57538351507
Belgium	2017	7	41825.76283	1.1E+07	2.1259709	148.2	45.5	-3.7289E+10
Belgium	2018	7.1	42403.53359	1.1E+07	2.053165	151.7	48.7	-4.1601E+10
Belgium	2019	7.2	43065.51507	1.1E+07	1.4368196	150.9	50.6	-2.138E+10
Belgium	2020	6.9	40424.63884	1.2E+07	0.7407918	146.5	50	-2.4347E+10
Bulgaria	2012	10.8	6693.612364	7305888	2.9545683	30	51.6	1788110000
Bulgaria	2013	10.2	6693.450153	7265115	0.8900935	53.2	51.7	1989040000
Bulgaria	2014	9.9	6796.689119	7223938	-1.4181838	61.5	54.2	1093600000
Bulgaria	2015	9.4	7074.681023	7177991	-0.1046333	68.8	51.1	2221390000
Bulgaria	2016	6.6	7341.047614	7127822	-0.7986499	137.6	50.9	1488430000
Bulgaria	2017	7	7599.124957	7075947	2.0615962	134.2	54.4	2007290000
Bulgaria	2018	7.1	7859.678037	7025037	2.8145447	125.7	55.4	1809860000
Bulgaria	2019	7.2	8234.781334	6975761	3.1037294	127.3	55.7	2221250000
Bulgaria	2020	6.9	7920.91133	6934015	1.672441	124.4	57.8	3599690000
Bulgaria	2021	6.9	8293.567877	6899125	3.2977444	120.7	58.2	2124260000
Germany	2012	5.2	40069.35396	8E+07	2.0084909	215.2	77.3	65443087632
Germany	2013	4.8	40135.01583	8.1E+07	1.504721	213.5	75.8	67199694459
Germany	2014	5.6	40851.16173	8.1E+07	0.9067979	173.1	72.3	19488312315
Germany	2015	6.6	41103.25644	8.2E+07	0.5144205	170.6	67.5	62422464519
Germany	2016	7.1	41682.03224	8.2E+07	0.4917486	177.4	61.5	64707795193
Germany	2017	7.5	42639.55441	8.3E+07	1.5094966	174.7	63.3	1.09506E+11

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.8288943

Germany	2018	8	42973.28996	8.3E+07	1.7321677	172.3	59	1.66868E+11
Germany	2019	9	43329.05069	8.3E+07	1.445667	166.8	60.2	71679659389
Germany	2020	9.4	41315.31357	8.3E+07	0.5066899	162.9	59	1.42779E+11
Estonia	2013	9.3	16553.38326	1317997	2.7805666	148	73.1	1097942107
Estonia	2014	10.2	17096.64458	1314545	-0.1061751	140.7	68.9	1781648554
Estonia	2015	11.6	17402.03761	1315407	-0.492326	169.5	82.3	-715465130
Estonia	2016	11.1	17945.94496	1315790	0.1486849	174.6	73.8	925762256.7
Estonia	2017	10.5	18962.4103	1317384	3.4172355	165.6	77	1735775304
Estonia	2018	9.2	19677.67684	1321977	3.4363269	169.3	79.5	1232358348
Estonia	2019	9.3	20408.43624	1326855	2.2772593	175.5	79.5	3052870944
Estonia	2020	9.1	19767.0776	1329479	-0.4445311	173.9	77.7	3616480318
Estonia	2021	9.1	21421.14587	1329254	4.6531667	168.7	77.5	7361224248
Ireland	2013	5.3	46339.4693	4623816	0.5087149	135.8	51.7	70811172728
Ireland	2014	5.7	50010.43421	4657740	0.1825423	123.7	39.7	97382259039
Ireland	2015	6.1	62012.48493	4701957	-0.2898791	128.7	45.4	2.3706E+11
Ireland	2016	6.1	62568.6266	4755335	0.0083063	160.2	45.6	1.02916E+11
Ireland	2017	7	67424.22856	4807388	0.3405316	154.9	47.2	58300808408
Ireland	2018	7.6	72607.63185	4867316	0.4883702	147	49.4	67361732390
Ireland	2019	7.9	75143.01847	4934340	0.9390445	147	49.5	-4.6633E+10
Ireland	2020	7.5	78732.55332	4985674	-0.3345846	140.7	50.8	34782774941
Ireland	2021	7.4	88588.48407	5028230	2.358143	166.5	65.8	81018660490
Latvia	2015	12.2	13786.4568	1977527	0.1742422	90.9	61.5	812843819.5
Latvia	2016	10.7	14242.43282	1959537	0.1406333	138.9	62.2	335420977.5
Latvia	2017	10.4	14845.2772	1942248	2.9303631	139.5	62.7	1189988063
Latvia	2018	9.8	15558.27611	1927174	2.5344542	140.2	62	424290064.5
Latvia	2019	8.5	16056.03516	1913822	2.8114092	143.8	62.6	1114592059
Latvia	2020	8.8	15559.59465	1900449	0.2190649	145.1	61.7	938191969.1
Latvia	2021	8.5	16406.22601	1883162	3.2758294	142.3	62.1	3721078150
Lithuania	2013	13.7	13262.33446	2957689	1.0474794	132.6	72.1	768657972
Lithuania	2014	12.9	13850.00013	2932367	0.103758	130.1	70.8	357323216.2
Lithuania	2015	12.9	14263.96458	2904910	-0.8840974	120.3	70.8	1036954106
Lithuania	2016	12.9	14810.25178	2868231	0.9055251	141.4	62	1177533776
Lithuania	2017	14.2	15661.99625	2828403	3.7228886	136.7	67.6	1383731106
Lithuania	2018	13	16443.58529	2801543	2.6979278	153.5	69.1	1299841764
Lithuania	2019	11.1	17241.25535	2794137	2.3345094	158.9	70.8	3434299310
Lithuania	2020	10.9	17213.8143	2794885	1.1998944	165	72.4	4478593693
Lithuania	2021	11	18072.28837	2795321	4.6835442	165.2	72.4	2944691730
Netherlands	2015	6.2	45193.40322	1.7E+07	0.6002481	164.9	66.9	3.32926E+11
Netherlands	2016	5.9	45938.78504	1.7E+07	0.3166667	181.5	63.9	2.41091E+11
Netherlands	2017	8.5	46997.34545	1.7E+07	1.3814587	176.2	67.4	2.27393E+11
Netherlands	2018	6.7	47826.81912	1.7E+07	1.7034979	179.2	66.3	-3.3034E+11
Netherlands	2019	7.4	48443.73205	1.7E+07	2.6336991	173.3	65.5	-1.4192E+10
Netherlands	2020	7.5	46345.34721	1.7E+07	1.2724604	167.7	66.9	-2.1871E+11
Netherlands	2021	7.4	48424.09103	1.8E+07	2.6757201	166.7	66.3	-1.4174E+11
Poland	2012	12.4	11519.68501	3.8E+07	3.5603715	52	60.6	7180000000
Poland	2013	13	11656.40309	3.8E+07	0.9919826	95.5	68	1029000000
Poland	2014	11.4	12059.24671	3.8E+07	0.0538213	94	65.6	20455000000
Poland	2015	10.6	12578.49547	3.8E+07	-0.8741259	111.2	69.3	15598000000
Poland	2016	11	12979.25526	3.8E+07	-0.6647673	153.1	73.7	17750000000
Poland	2017	10.1	13604.54047	3.8E+07	2.0759355	151.6	73.8	11999000000
Poland	2018	9.8	14332.91589	3.8E+07	1.8129516	137.8	58.7	19204000000

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Poland	2019	10.3	15016.6733	3.8E+07	2.2274788	144.6	73.4	17619000000
Poland	2020	11.4	14660.79392	3.8E+07	3.3744697	144.9	75.8	19151000000
Poland	2021	14	15549.66919	3.8E+07	5.055027	126.1	72.7	37113000000
Portugal	2012	7.7	18654.95753	1.1E+07	2.7733385	104.2	65.2	21396375527
Portugal	2013	8	18584.55405	1E+07	0.2744167	108.2	59.9	15745220666
Portugal	2014	8.4	18833.05183	1E+07	-0.2781534	107.6	61.3	12045808665
Portugal	2015	8.3	19250.10654	1E+07	0.4879386	116.2	65.3	1270014233

The table is compiled by the authors, The data is taken from the World Bank (2023), OECD (2023), and Numbeo databases (2023).