

THE REAL ESTATE PRICES POST-COVID: A FSQCA ANALYSIS

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ABSTRACT

The real estate market and the assets that compose it, are an essential asset to human beings. As such, several agents that influence and motivate various sectors of economic activity are part of this market. This study aims to analyze the evolution of the real estate sector, and which are the main factors that may influence its price, in the context of a pandemic. This work will focus on the real estate sector and on five different factors that may influence its price, such as: Labour Cost, Construction Cost, Settlement Area, Inflation Rate and Covid-19 Cases. The period for this research ranges from 3/15/2020 to 11/14/2021, a total of 96 weeks, to integrate the covid-19 factor into the study. The results show that the variables fsLabourCost and fsSettlementArea are both necessary conditions for an increase in house prices.

Keywords: Real estate, fsQCA, COVID-19, Inflation rate

RESUMO

O mercado imobiliário e os ativos que o compõem, são um ativo essencial para o ser humano. Como tal, fazem parte deste mercado vários agentes que influenciam e

motivam vários setores da atividade económica. Este estudo pretende analisar a evolução do setor imobiliário, e quais os principais fatores que podem influenciar o seu preço, no contexto de uma pandemia. Este trabalho incidirá sobre o setor imobiliário e sobre cinco fatores diferentes que podem influenciar o seu preço, tais como: Custo da Mão de Obra, Custo da Construção, Área de Liquidação, Taxa de Inflação e Casos de Covid-19. O período para esta pesquisa varia de 15/3/2020 a 14/11/2021, um total de 96 semanas, para integrar o fator covid-19 no estudo. Os resultados mostram que as variáveis *fsLabourCost* e *fsSettlementArea* são condições necessárias para um aumento dos preços das casas.

Palavras-chave: Mercado imobiliário, *fsQCA*, COVID-19, Taxa de inflação

1. INTRODUÇÃO

Housing prices have been rising in euro area countries. It is therefore important to assess whether house prices are in line with the economic fundamentals that underpin supply and demand in the housing market. The major outbreak of the covid-19 pandemic has generally affected the world economy, which has led to a major change in people's lives. Our article stands out by making an analogy, beyond economic and socio-economic factors, to perceive whether the pandemic was prevalent and how it affected house prices.

For this, we decided to study theoretical and practical subjects, presenting a chronological line of thought, and addressing aspects of common understanding. The *fsQCA* program will then be used. That said, this article is based essentially on scientific articles, dealing with all definitions supported on theoretical bases.

The following chapters are structured in such a way as to facilitate the reader's understanding, starting first, with a literature review, as literary support. Next, we will

address the main theme, proving the influence of the factors in changing the price of houses.

2. LITERATURE REVIEW

2.1. INFLATION RATE

According to Korkmaz (2019), the interest rate has a great impact on real estate prices. Financial institutions, which provide home loans, are influenced by the inflation rate, as they are forced to increase interest rates. In this sense, the rising cost of financing discourages real estate investors from taking out loans, directly influencing housing prices.

A high inflation rate, causes an increase in house prices, similarly affecting consumption and economic growth (Kuang & Liu, 2015).

Tsatsaronis and Zhu (2004), identify inflation as the main driver of real house prices. Goodhart and Hofmann (2008), on the other hand, identify a link between house prices and monetary and macroeconomic variables, that is, the inflation rate in conjunction with other variables like credit demand and credit supply will impact housing costs. On the other hand, the study conducted by Demary (2010), indicated that inflationary shocks combined with interest rate shocks, reduce house prices.

2.2. CONSTRUCTION COST

Rising material costs, fuel prices, production price, import price, and interest on loans are among the major factors responsible for the cost of housing constructions (Mansur, S. A., Abdul Hamid, A. R., & Yusof, N. A, 2020). According to Laia et al. (2018), on the supply side, the main determinants of the cost of construction, include the availability of land for construction and the associated price, the existing wages in the sector, the cost of construction materials, the costs of the processes in the licensing

entities, the cost of real estate mediation, public and municipal investment in social housing, as well as the subsidization policy to the sector.

2.3. LABOUR COST

One of the factors that may cause the price of housing to fluctuate in the long term is linked to population growth (Turk, 2015). If, in each area, population growth exceeds the construction rate, the price of housing will rise (Mulder, 2010).

2.4. SETTLEMENT AREA

Globally, tourism has been growing significantly over the last 30 years and is considered one of the main factors in the rise in house prices. In a study of 30 OECD countries, it was found that tourism and its interaction with income inequality has a positive impact on house prices. Such a fact, can be explained either by the lack of accommodation or the possibility for foreigners with monetary means, to buy their own housing, which alienated with the high demand, increases the pressure on prices in that region (Paramati & Roca, 2019)

D'Albis et al. (2019) found that immigration has no significant effect on real estate prices, in fact, high real estate prices correspond to low immigration rates. However, compared to emigration, there was a positive association between emigration rates and real estate prices. Furthermore, a greater supply of social housing has no impact on housing prices.

On the other hand, Cochrane and Poot (2021), found in a study of 8 European countries that both immigration and emigration lead to higher prices and rents, and consequently lower housing affordability. However, the housing impact strongly depends on the demographic composition, migration flow and macroeconomic expectations.

2.5. COVID-19 CASES AND HOUSE PRICES

According to Uchegara, I., (2020), the Covid-19 pandemic has hit the real estate sector hard, with industry experts internationally raising concerns about the risk posed to the sector. The “stay-at-home” policy stagnated both the real estate sector and so many other economic activities. The return on investments initiated but not completed, due to the negative pandemic effect, resulted in a financial crisis in the sector. (Uchegara, I., 2020). In this sense, the Covid-19 outbreak, has great weight and unpredictability, being directly linked to the global financial crisis (Baker et al. 2020).

The research of Carlsson-Szlezak et al. (2020), showed that the heterogeneity of real estate with the variation of the transmission channels of macroeconomic shocks affected all markets, including real estate. Thus, it is not easy to predict the impact of the pandemic in the medium and long term on economic growth and on real estate markets. The longer a pandemic situation lasts, the greater the liquidity and capital risks in the property market.

Consequently, shortly after the outbreak of the covid-19 pandemic there was a significant drop in house prices in several countries around the world (Cheung et al., 2020; Nicola et al., 2020)

3. METHODOLOGY

Charles Ragin developed a methodology to obtain linguistic summaries of case-associated data, calling it fsQCA (Ragin, 2000). FsQCA is a diversity-oriented software approach that proposes different alternative ways to understand the construction of an outcome and, moreover, is suitable for observing stochastic data and complex phenomena (Kent 2005; Shipley et al. 2013; Henik 2015). Preliminarily, the fsQCA was developed for a small sample size and has so far been used mainly

with small and medium samples (Kraus, Ribeiro- Soriano, Schüssler, 2018) being that the method can also be applied with large datasets (Cooper and Glaesser, 2010).

The fsQCA aims to gauge the conditions that are sufficient, but not necessary, to cause an outcome (Woodside 2011). Thus, fsQCA employs an algebraic Boolean logic to examine the relationships between an outcome and all binary combinations of the independent variables and this methodological approach provides the opportunity to detect relevant configurations that ensure high performance in the condition outcome (Ragin 2000; Fiss 2007; Mayrhofer 2009; Aguilera-Caracuel et al. 2014; Henik 2015). In the first phase of fsQCA analysis, variable values are operationalized as association scores within predefined sets and are obtained through calibration (Ragin 2008; Meuer 2014).

The present research was focused with the intention of integrating the covid-19 factor into the study just as factors that directly and indirectly influenced the real estate industry, and in turn, the price of houses. To have a detailed quantitative analysis, it was decided to analyse different variables where the values collected had an annual frequency. Figure 1 represents the conceptual framework of this study that shows the main factors contributing to the increase of house prices.

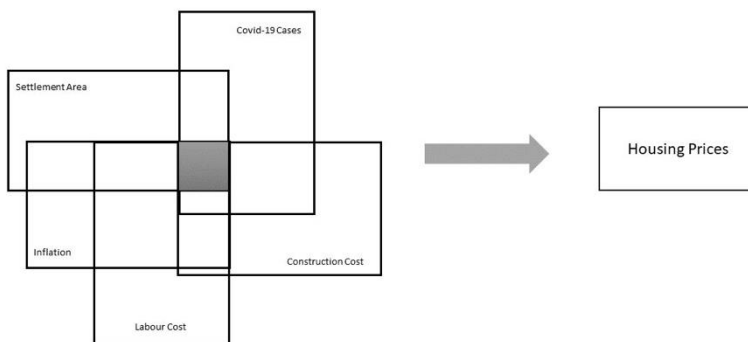


Figure 1: Conceptual Framework

Source: Author's elaboration

Figure 2 shows the variables description that influence house prices in countries of Europe.

Variable description	Variable name	Supporting articles
Labor Cost	Laborcost	Pashardes et al. (2009)
Construction Cost	Constructioncost	(Mansur, S. A., Abdul Hamid, A. R., & Yusof, N. A. 2020); Neves et al. (2018)
Settlement Area	SettlementArea	Biagi et al. (2015); Kavarnou & Nanda (2018); Belke & Keil (2018)
Inflation Rate	InflationRate	Tsatsaronis and Zhu (2004); Goodhart and Hofmann (2008); Demary, M. (2010) Kuang, W., & Liu, P., (2015); Korkmaz (2019)
Covid-19 Cases	Covid19Cases	Baker et al. (2020); Carlsson-Szlezak et al. (2020); Cheung et al., (2020); Nicola et al., (2020); Uchehara, I., (2020)

Figure 2: Variables description

Source: Author’s elaboration

This study is based on data available in the EUROSTAT database, which provides statistical data, with the most varied indicators, in Europe. After checking the most appropriate indicators for the subject under study, we obtained data from 37 countries in Europe from which we used a sample of 27 countries because they have sufficient data for the analysis in question. Figure 3, shows the countries that contributed to the results of this study:

Austria	Czechia	Germany	Latvia	Poland	Spain
Belgium	Denmark	Greece	Lithuania	Portugal	Sweden
Bulgaria	Estonia	Hungary	Luxembourg	Romania	
Croatia	Finland	Ireland	Malta	Slovakia	
Cyprus	France	Italy	Netherlands	Slovenia	

Figure 3: List of Countries

Source: Author’s elaboration

4. RESULTS

4.1. DESCRIPTIVE ANALYSIS

As described in the methodology, the research used 6 statistical variables as potential influencing factors of house prices in Europe. Below, Table 3 shows the structures of the statistical variables, with the appropriate calibration of the data at values between 0 and 1 (Fiss, 2011). As it can be observed, there are 68 observations that represent a specific year for a specific country. The researchers chose to only include in the sample the year-observation that did not present missing values in each of the chosen variables, as a result, it was not possible to obtain all year observations for each country.

Variable	Mean	Std. Dev.	Minimum	Maximum	N Cases	Missing
HousingPrices	135.9382	20.74954	98.5	208	68	0
LaborCost	35523.91	15677.55	4491	65036	68	0
Constructioncost	113.8265	11.28593	99.2	161.3	68	0
SettlementArea	847.7088	536.3806	190.6	2458.7	68	0
InflationRate	1.569118	1.427797	-1.3	5.2	68	0
Covid19Cases	510165	957368.2	0	5.4407e+06	68	0

Figure 4: Descriptive statistics

Source: Output from FsQCA

4.2. MAIN ANALYSIS

This research aimed to study whether certain factors can influence the rise/fall of house prices in 27 countries in Europe. To do this, an analysis of all necessary conditions that can be crucial to influence our variable in the fsHousingPrices study should be conducted. A condition variable is "necessary" if the consistency value is equal to or greater than 0.9, and "almost always necessary" if it is equal to or greater than 0.8 (Ragin, 2008; Schneider, Schulze-Bentrop, & Paunescu, 2010).

Figure 5 shows the set of all variables and the corresponding consistency, providing relevant information to verify if there are necessary conditions. As observed, no variable is considered necessary condition.

Outcome variable:	fsHousingPrice	fsHousingPrice
Conditions tested:	Consistency	Coverage
fsLabourCost	0.651892	0.660147
~fsLabourCost	0.725004	0.615375
fsConstructionCost	0.721356	0.733316
~fsConstructionCost	0.723228	0.611891
fsSettlementArea	0.685105	0.666964
~fsSettlementArea	0.717148	0.629936
fsInflationRate	0.636875	0.662733
~fsInflationRate	0.718746	0.596637
fsCovid19Cases	0.495794	0.739777
~fsCovid19Cases	0.789341	0.527827

Figure 5: Results of necessary conditions

Source: Author’s elaboration

We can distinguish the variables into two major groups, those that contribute to high (positive) values and those that contribute to low (negative) values. According to Table 4, even though the variables ~fsLabourCost and ~fsCovid19Cases have both the highest values, there are no necessary conditions as per Ragin (2008). In order to be considered a necessary condition, the value for consistency should be higher than 0.9.

After analysing the consistency of each of the variables, we move on to a sufficiency analysis and the cautious definitions that may lead to the increase in house prices.

According to Table X, the outcome fsHousingPrice presents 7 final solutions. In an initial instance it is possible to observe the existence of only core present conditions (there are only large black circles). On the other side, they are both small and large

white circles (peripheral conditions and core conditions, respectively). fsSettlementArea and fsCovidCases have small none core peripheral conditions and core present conditions.

	fsHousingPrices						
Casual Configuration	1	2	3	4	5	6	7
fsLaborCost		o	o	●	●	●	●
fsConstructioncost	●	●		●		●	●
fsSettlementArea		o	●	o	●	●	●
fsInflationRate	o		o		●		●
fsCovid19Cases	o	●	●	●	●	o	
Consistency	0.897027	0.92581	0.894226	0.912543	0.9508	0.902261	0.895287
Raw Coverage	0.498322	0.304103	0.256057	0.296702	0.255171	0.395586	0.348762
Unique Coverage	0.0939738	0.0444246	0.00410503	0.0293945	0.00420004	0	0.0107709
Overall Solution consistency	0.858338						
Overall Solution coverage	0.679608						

Note: ● represents the presence of a condition, and○ represents the absence of a condition. Large circles indicate core conditions, and small circles indicate peripheral conditions. Blank spaces indicate “does not contribute to the configuration.”

Figure 5: Results of intermediate solutions

Source: Author’s elaboration

In a deeper analysis we can group the solutions by similarity in their combinations, for example, solutions 5 and 7 are solutions in which their combinations have only high values, in which in solutions 1 and 2 the variables fsSettlementArea and fsLabourCost are present in both. Solutions 4 and 6 are quite similar, in that they have all the same conditions, with the exception that 4 uses the variable fsCovidCases and the 5 uses the variable fsSettlementArea, all others are equal. On the other hand, solutions 3 and 6 present both high variables with low values, all with the similarity that the fsVix variable is present in all low values.

4. DISCUSSION AND CONCLUSIONS

After analyzing all the results, we could compare them with the results of previous research.

It is found that the set of variables of configuration 5 presents a high consistency regarding the increase in the price of houses and that if we increase the cost of manufacturing, the price of land, inflation and the number of cases Covid-19, we observe a consistency of 0.9508 of the increase in the price of houses. Our research achieved results when it is verified that in 4 combinations the consistency value was greater than 0.9 and that even the lowest values of the combinations are relevant for the increase in house prices, being the same above 0.85.

According with Carlsson-Szlezak et al. (2020), the heterogeneity of real estate with the variation of the transmission channels of macroeconomic shocks affected all markets, including real estate. This reality has significant consequences for the European economy, especially for younger and disadvantaged households. Rising house prices are the result of several factors, including higher demand for real estate due to an increasing population, a shortage of land supply, and strong investment demand. In addition, cheap credit and low inflation played an important role in the price increase. While rising prices are good news for homeowners, they are still a major challenge for those trying to buy their first property. European governments must work together to find solutions to this problem.

It is important, however, that European governments work together to enable everyone to have access to a home. We can state from figure X that we have as conditioning variables the labor cost and covid-19 as necessary variables. We can thus conclude that all the variables chosen had an impact and are relevant for predicting the possible rise or fall of house prices in Europe.

This study is not free of limitations. The first limitation is the sample, which was limited to the time chosen during and post Covid. Another study looking at the effects of the same variables in other time periods is recommended, for example, in a pre-pandemic, or during the current conflict in Ukraine. Finally, this study is also limited to the chosen methodology.

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