European Network for Housing Research

UNIVERSIDADE AUTÓNOMA DE LISBOA

Conference - Unsettled Settlements: Housing in Unstable Context

Working Group 18 – Housing Market Dynamics

Housing prices, tenancy and external shocks: the Portuguese evidence

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1. Introduction

- When the Special Resettlement Program started in 1993, several studies pointed to the need to build about half a million houses, which was not unrelated to the existence of a huge amount of informal and precarious constructions (e.g., Guerra (1999), Cachado (2013), Alves (2016), Allegra et al. (2017), Fahra (2017)).

- In twenty years, the country has produced one and a half million new homes, closing, in technical terms, the housing deficit.

- Nevertheless, there are still problems related to the degradation and increase in the construction of the housing stock in urban centers and outskirts of cities, with the mobility needs of households and with the cost of housing.

- According to the OECD (2020), since 2010, Portuguese families have been the ones that most allocate the largest proportion of their income to housing costs.

- It is in this context that the expression "*so many homeless people without a house and so many homeless housing*" has taken on a recent dimension.

2. Methodology

Categorical Principal Components Analysis – CATPCA

- Principal Component Analysis is an exploratory multivariate analysis technique that transforms a set of correlated variables into a smaller set of independent variables, linear combinations of the original variables. Thus, this method aims to reduce data complexity.

- Thus, from the available variables (the entered data) indicators are used that aggregate a large part of the information present in the original variables. These indicators, called main components (Dimensions) are the linear combination of all the studied variables.

- In this case, 2 components (2 Dimensions) were defined to simplify the analysis of information on the variables under study.

3. Data and variables

Variables	Meaning of variables
Cust. Hab. Fam.	New Housing Construction Cost Index
Est. Par. Hab.	Housing stock estimates
Ind. Pre. Res	Residential price index
Tx. Inf. Hab.	Inflation rate with housing
Emp. Hab.	Home loans to individuals
Ren. Dis. Bru. Fam.	Gross disposable income of households
Tx. Cre. PIB.	GDP growth rate
Tx. Jur.	Reference interest rate in the euro area (index)
Tx. Des.	Unemployment rate
Total do ativo	
Aval. Banc.	Bank valuation of housing properties
Ind. Const. Hab.	Housing construction cost index
Cust. Hab. Fam.	Housing costs per family
Ind. Rendas	housing rent index

4. The model: Categorical Principal Component Analysis (CATPCA)

Categorical Principal Components Analysis (CATPCA)

Variance accounted for

	Centroid coordinates			Total (vector coordinates)		
	Dimension			Dimension		
	1	2	Average	1	2	Total
Cust_Hab_Fam	,716	,453	,585	,647	,042	,689
Est_Par_Hab	1,000	1,000	1,000	,735	,185	,920
Ind_Pre_Res	,714	,652	,683	,321	,532	,852
Tx_Inf_Hab	,759	,621	,690	,087	,567	,653
Emp_Hab	1,000	1,000	1,000	,898	,011	,909
Ren_Dis_Bru_Fam	,488	,797	,643	,247	,490	,737
Tx_Cre_PIB	,119	,582	,350	,088	,502	,589
Tx_Jur	,723	,791	,757	,529	,247	,776
Tx_Des	,684	,378	,531	,637	,268	,906
Total ativo	6,203	6,274	6,239	4,188	2,843	7,031
% de variância	68,925	69,713	69,319	46,532	31,590	78,122

5. Model summary

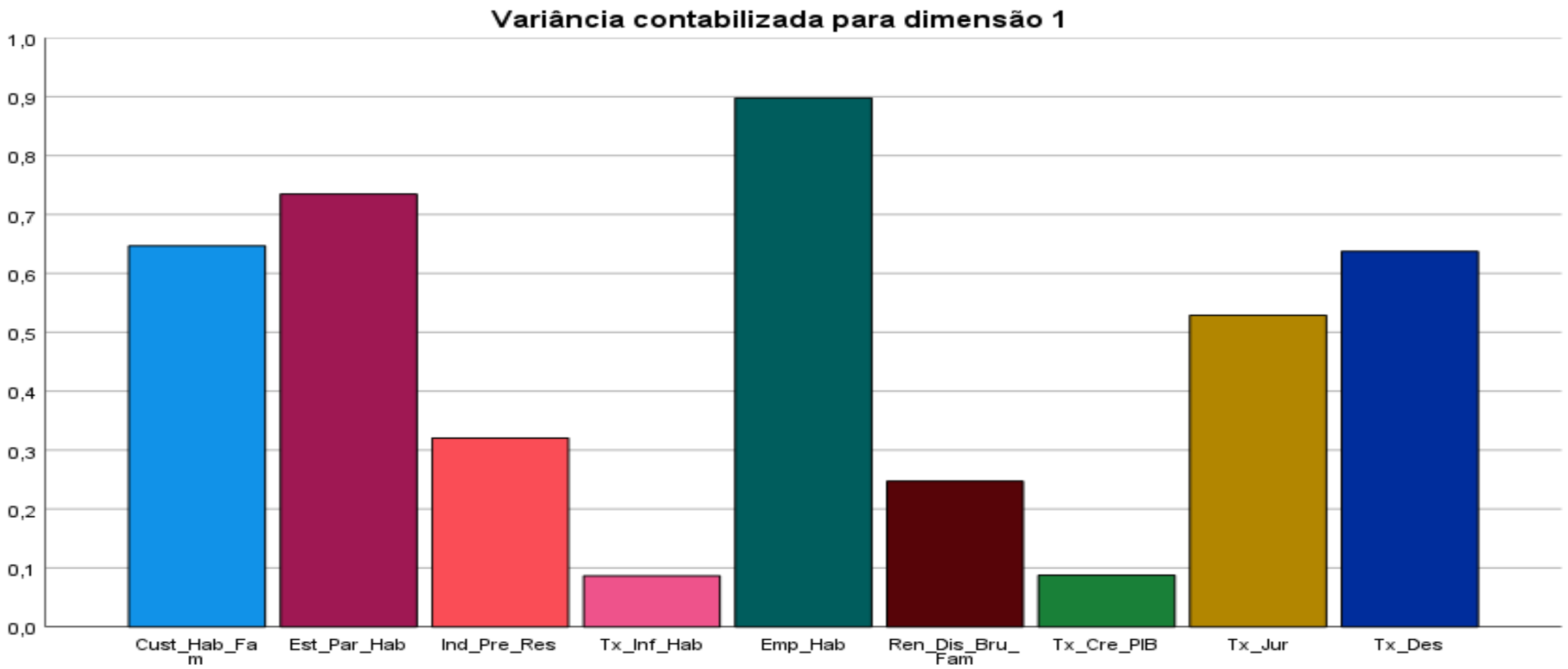
Model summary

Dimension	Cronbach's Alpha (a)	Variance accounted for	
		Total (self-value)	% of variance
1	,856	4,188	46,532
2	,729	2,843	31,590
Total	,965[a]	7,031	78,122

(a) Total Cronbach's Alpha is based on the total eigenvalue.

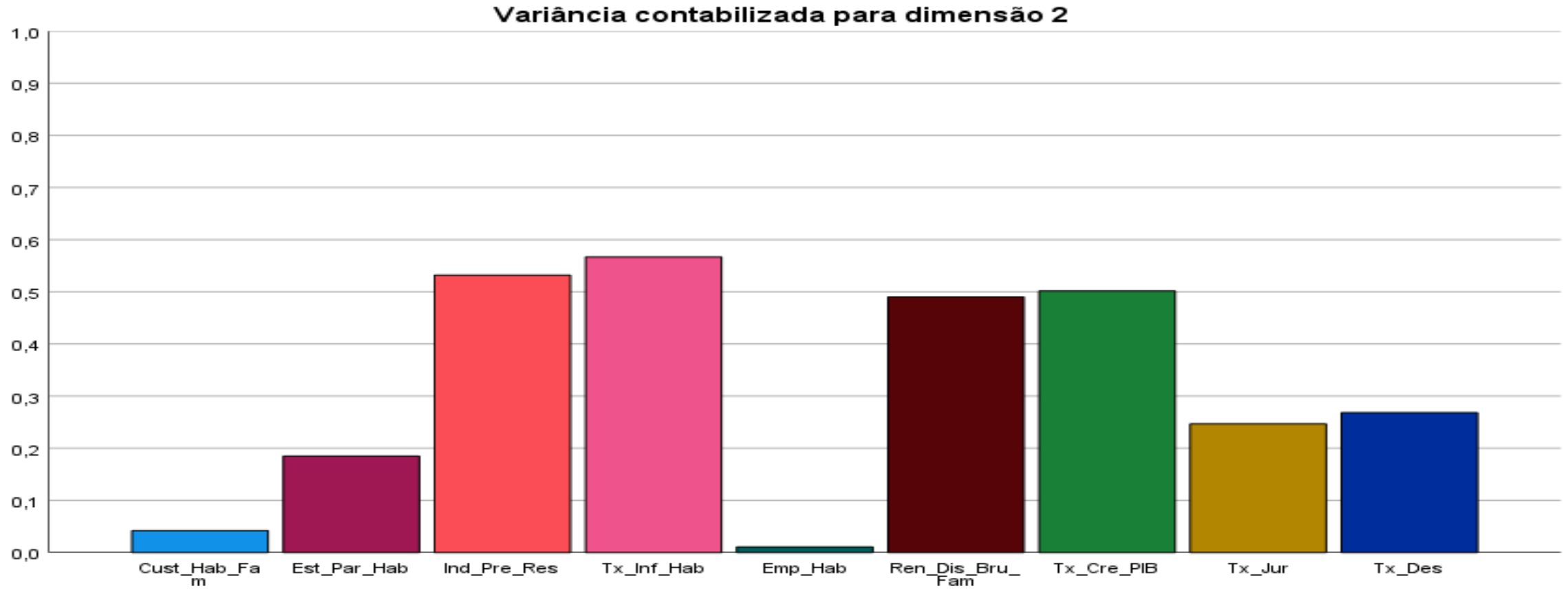
6. Results Analysis

In the first dimension, the variables with the highest variance weight were: Home Loans; Housing Park Estimates; Unemployment rate; and Housing Costs by Household.



6. Results Analysis

In the second dimension, the variables with the greatest weight of variance were: Inflation Rate with Housing; Housing Price Index; GDP growth rate; and Gross Disposable Income per household.



6. Empirical Results

Original correlation variables

	Cust_Hab_Fam	Est_Par_Hab	Ind_Pre_Res	Tx_Inf_Hab	Emp_Hab	Ren_Dis_Bru_Fam	Tx_Cre_PIB	Tx_Jur	Tx_Des
Cust_Hab_Fam	1,000	,604	-,678	-,172	-,660	,227	-,233	-,334	,704
Est_Par_Hab	,604	1,000	-,110	-,445	-,745	,836	,049	-,757	,495
Ind_Pre_Res	-,678	-,110	1,000	-,237	,586	,352	,504	,050	-,839
Tx_Inf_Hab	-,172	-,445	-,237	1,000	,182	-,466	-,498	,609	,184
Emp_Hab	-,660	-,745	,586	,182	1,000	-,352	,413	,741	-,789
Ren_Dis_Bru_Fam	,227	,836	,352	-,466	-,352	1,000	,210	-,585	,064
Tx_Cre_PIB	-,233	,049	,504	-,498	,413	,210	1,000	-,064	-,525
Tx_Jur	-,334	-,757	,050	,609	,741	-,585	-,064	1,000	-,275
Tx_Des	,704	,495	-,839	,184	-,789	,064	-,525	-,275	1,000
Dimensão	1	2	3	4	5	6	7	8	9
Autovalor	4,188	2,843	,820	,590	,321	,151	,048	,033	,006

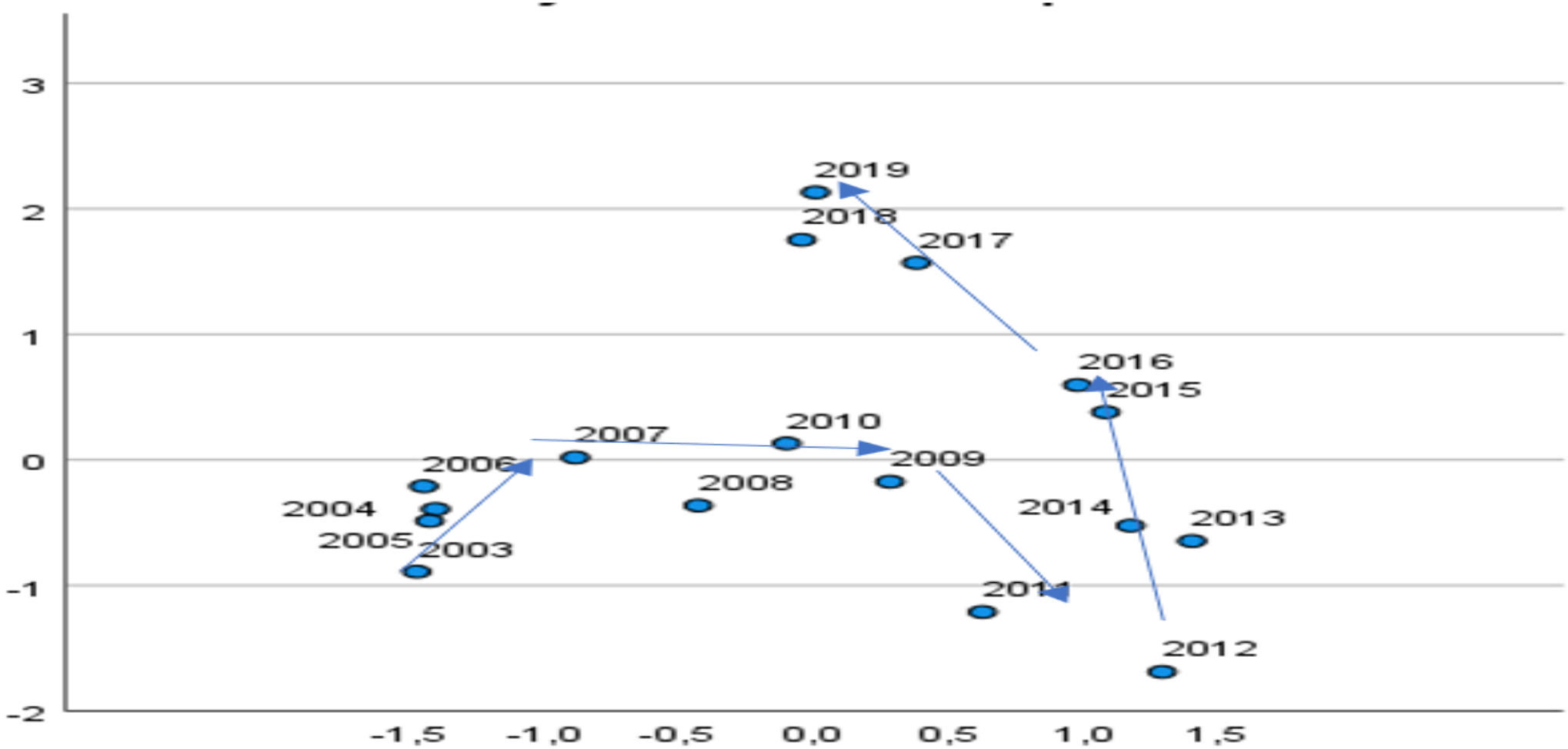
6. Results Analysis

Analysis of correlations between variables

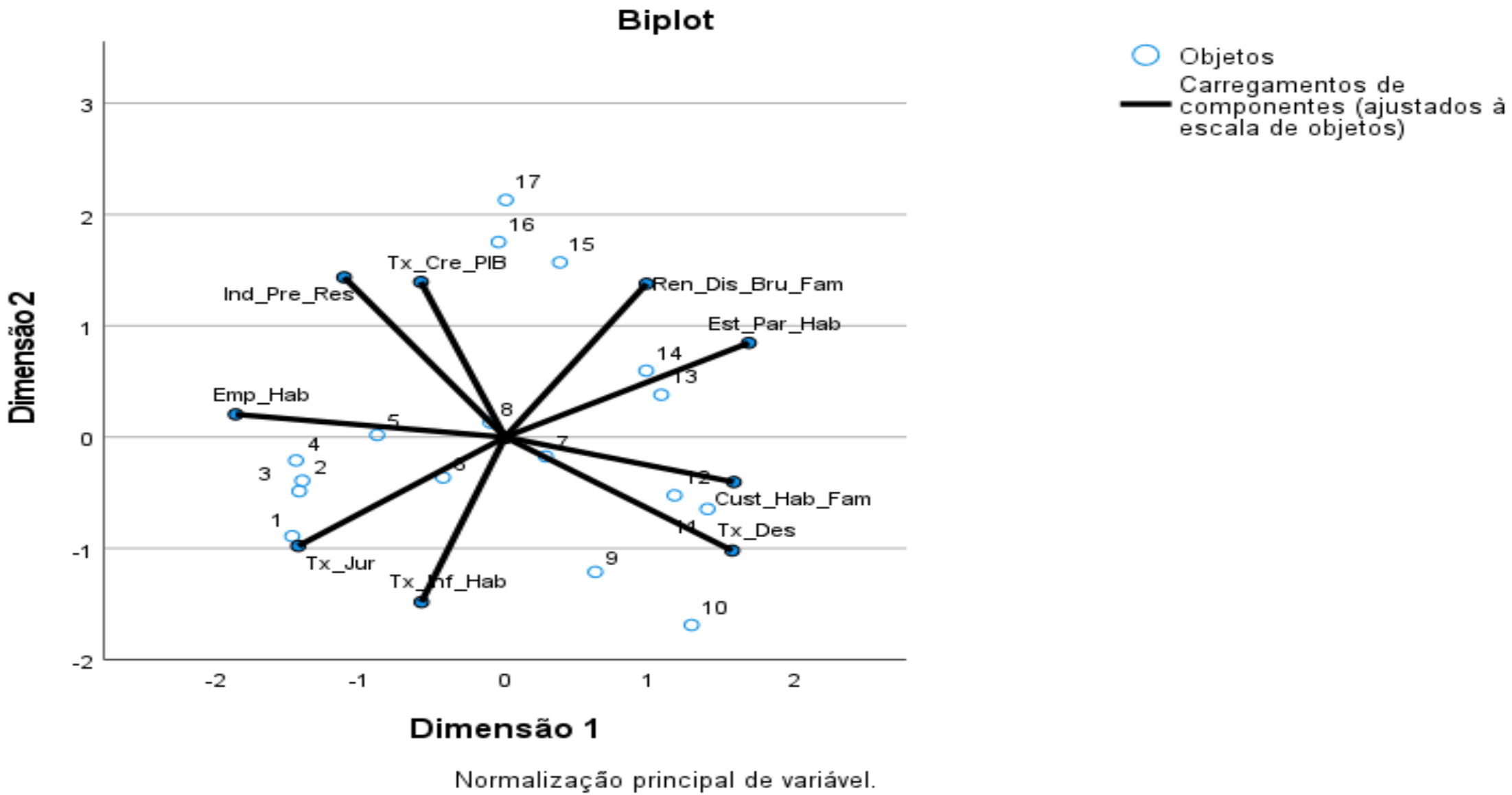
- Strong positive correlation (>0.7):
  - Housing Cost / Unemployment Rate
  - Housing Loan / Interest Rate
- Positive correlation (>0,5 e <0,7):
  - Housing Cost per Household / Housing Park Estimate
  - Housing Cost per Household / Unemployment Rate
  - Home Price Index / Housing Loan
  - Residential Price Index / GDP Growth Rate
  - Housing Inflation Rate / Interest Rate
- Strong negative correlation (>-0.7):
  - Housing Stock Estimate / Housing Loans
  - Housing Stock Estimate / Interest Rate
  - Residential Price Index / Unemployment Rate
  - Housing Loans / Unemployment Rate
- Negative correlation (>-0.5 and <-0.7):
  - Housing Cost / House Price Index
  - Housing Cost / Housing Loans
  - Gross Disposable Income per Household / Interest Rate
  - GDP Growth Rate / Unemployment Rate

7. Conclusions

- During the period analysed (2003 to 2019) there was a tendency to move from Dimension 1 to Dimension 2.
- In the image below, the arrows indicate the behaviour over the years.



7. Conclusions



7. Conclusions

- It is noted that at the beginning of the period analysed (2003-2007) Housing Loans, the Interest Rate and the Housing Inflation Rate had prevailed;
- Afterwards (2012-2014), the Cost of Housing per Household and the Unemployment Rate were the most significant original variables, and;
- At the end of the period analysed (2015-2019) the GDP Growth Rate, the Housing Price Index and the Gross Disposable Income per Gross Household were highlighted; there was a transformation in the use of housing in Portugal;
- Based on the results obtained, it is evident that at the beginning of the period studied, housing had a strong relationship with housing loans and interest rates;
- Then, in the post-2009 period, access to housing was linked to the Unemployment Rate and Housing Cost per Household; and
- In the end, with the Gross Disposable Income of Households, the Housing Price Index and the GDP growth rate.
- It can be said that there was a maturation of both Households and Banks to access housing, as it moved from a credit facility approach (2003-2007) to an availability of income and housing prices (2015).
- The various internal shocks on housing had no bearing on tenancy. The rental market continues to be distorted.

Thank you