

**TENURE CHOICE: FUNDAMENTALS AND A SIMULATION****Bernardo Alves Furtado**

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Real estate markets are subject to dynamic influences in relation to location, amenities and quality of life in the neighborhoods; regulation, zoning and population changes; but also in relation to macroeconomic factors, such as interest rates, inflation and business cycles. The decision to buy or rent a durable and financially significant asset is difficult for both experts and amateurs. Specifically due to the uncertainty regarding the evolution of parameters over time. In the case of real estate, in addition to the basic uncertainty of economic aspects, there is still uncertainty in relation to the construction market (and its regulation) and to relative prices that vary according to the location environment in which the property is.

This article provides a review of the classic urban economic fundamentals and the most recent financial and macroeconomic literature. There is a consensus that a complex number of variables apply to the real estate market and that no single predictive model can cover all the uncertainties that involve the decision-making process.

In order to offer a practical tool, we propose numerical simulations that evaluate the parametric space of rent versus purchase of properties for a probabilistic estimate of which option would be more advantageous, more often. In addition, the text contribution includes the original simulation code, which is flexible, adaptable to the interests of each user and reproducible, being adaptable for other countries. The python code can be downloaded from the GitHub repository: <<https://github.com/IpeaDISET/RealEstateDecision>>.

We analyzed four specific cases using relevant parameters to the Brazilian market: *i*) comparison between SAC and PRICE financing systems; *ii*) *ceteris paribus* variation of model parameters and production

of comparative figures; *iii*) complete generalization of parameters by choosing intervals and distributions; and *iv*) SAC system with readjustment of the mortgage due to inflation.

The simulation suggests that the amortization scheme known as SAC for the mortgage system is a better choice in almost two thirds of the cases, for the choice of parameters, intervals and chosen distributions.

Rent is preferable in cases with very low relative prices, real returns or very high inflation. The proposed discussion – based on the neoclassical model and the existing literature for the analysis of the parameter space and the probabilistically most advantageous choice – suggests that real estate financing contracts in Brazil should recognize this level of uncertainty and consider including explicit renegotiations of mortgages in shorter periods.

EXECUTIVE SUMMARY