PUBLIC POLICY TEST: PROPERTY ACQUISITION GRANTS, RENTAL PAYMENT OR CASH ASSISTANCE?

The decision between buying or renting a residential property does not have a correct financial answer, since information about future behavior of property appreciation, interest rates and inflation is unknown (Furtado and Souza, 2020). However, housing policies and the national imagination coincide in the understanding that home ownership should be something to pursue (Davies, 2013; Brazil, 2014). In fact, a recent analysis by the Organization for Economic Co-operation and Development – OECD (Causa, Woloszko and Leite, 2019) which studies the relationships between inequalities, housing policies and homeownership or rent identified that among member countries those with a lower percentage of owners exhibited greater inequality. This suggests that property ownership would contribute positively to the distribution of wealth. However, the authors add that it is also common to observe countries whose families are rich in wealth, but with a low flow of income, which also occurs in the Brazilian case. Poor states, such as Maranhão, maintain high rates of property ownership (Furtado and Galindo, 2010).

In terms of public policies, although there is no evidence whether the policy should favor families who rent or who own (Causa, Woloszko and Leite, 2019), typical policies favor owners who make up the average electorate.

In the United States, for example, households do not pay implicit rent taxes and earn discounts on interest payments on mortgages (Chan, Haughwout and Tracy, 2015). Also in Brazil, there is no levying of taxes on implicit rental income or on capital gains in the acquisition of financed property. Installments paid, insurance and interest that make up the initial capital invested in the payment of taxes are excluded.

From the point of view of families and society, there are indications that a higher proportion of owners in relation to tenants would promote greater engagement in communities, social capital and, consequently, higher priced properties (Malmendier and Steiny, 2017). Families that opt for rent, in turn, enjoy greater mobility as they do not focus their investments on real estate and are less subject to variations in this market. McAfee and Brynjolfsson (2017) assess that a new consensus is forming in which renting is better than owning.

In terms of the size of the property stock, there is no doubt that the percentage of Brazilian families that simply do not have enough resources to pay for the purchase or financing of their own home is also relevant. Data from the National Household Sample Survey (PNAD) 2014 by the Brazilian Institute of Geography and Statistics (IBGE), compiled in the real estate credit analysis carried out by Fioravante and Furtado (2018) suggest that almost forty million Brazilian families, more than 56% of the total, receive up to R$ 2,600 per month (2016 reais).

There is some housing policy effort to use vacant properties – which are around 10% of the total in the Brazilian case (Nadalin, Furtado and Rabetti, 2018) – for the allocation of social housing. Vacant public buildings are the priority objects of the policies. Although this is of interest, the amount does not seem to be enough to reduce household demand for housing.

In this context, *PolicySpace2* performs a simple test: given a fixed percentage of the municipal budget, the financial resources are applied alternately in three different policies and the results are compared with the execution of the simulation without any policy. Implementation details are described in subsection 7.10.9 in chapter 3. The contribution of this experiment, in our view, is precisely the remarkable endogeneity of the entire process. The following are endogenous to the simulation.

1) Family wages and employment relationship.

2) Family consumption and inclusion in the list of beneficiaries, according to the calculation of each family's permanent income.

3) The municipal collection itself, through the *proxy* of five taxes that are collected during the monthly stages of the simulation.

4) The process triggered after the application of the policy, which are:

   a) the family that obtains possession of the property (and becomes the owner);

   b) stops paying rent for 24 months; or

   c) that increases monthly income – this monetary-financial increase generates repercussions in the following months in the context of the simulation itself.

Additionally, since policies are simulated with exactly the same set of rules and parameters, their ability to compare results with each other is enhanced.

1 RESULTS OF COMPARISON BETWEEN POLICIES

In order to simplify the analysis, we will name each of the policies as:

- property (*buy*) – when the properties are transferred to the families;

- rent (*rent*) – in the case where families receive the voucher payment of rent for the next 24 months;

- aid (*wage*) – when resources are divided and distributed among registered families in terms of monetary assistance; and

- absence of policy (*no_policy*) – for the case in which the model is simulated in the standard form and the money collected by the municipalities is fully invested in improving the quality of life.

Fundamentally, although the (endogenous) volume of resources invested in each policy is quite similar,[1] the group that benefits from each of the policies is different in terms of size, given the per-family costs of each policy. As a result, public investment in the property modality serves, in the standard case, an average of 10.7 families per month. Comparatively, 42.2 families receive a voucher for rent and 1,060.3 families are awarded the monetary assistance, in the context of 1% of the simulated population, each month. It is also necessary to consider that the effects of policies are different in time. While the home belongs to the family on a permanent basis, rent is restricted to periods of 24 months, and aid is only received in a given month. In fact, the proposed policy design in the aid modality is the distribution of a small amount of money to a larger number (first decile of endogenous poverty) of families.

With this, while property and rent policies are aimed at a smaller number of families, although they are focused primarily and gradually on those with less wealth, the aid policy works in practice as a redistribution of resources collected annually and divided among families in the lower part of the distribution of wealth in the municipality.

The numerous indicators of the comparative results between the three policies and the baseline scenario suggest that the aid achieves better results in practically all indicators, for example, in the indicator of the percentage of families that rent and whose rent value does not exceed 30% of their permanent income or in the indicator that follows the monthly consumption of families (figure 1). However, the greater dynamism of the economy, given by the increase in household consumption, in the case of the aid and rent policy, also leads to an increase in the indicator of prices in the order of 15 percentage points (pp) over the ten years of the simulation (figure 2).

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1. The values are not exactly the same, as there are endogenous changes to the simulation that affect the fundraising for each policy. Additionally, the application may vary at the margin, since the resources to buy the next property, for example, are not enough and it is necessary to wait for the following month to make the investment.

FIGURE 1

Average household consumption indicator for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)
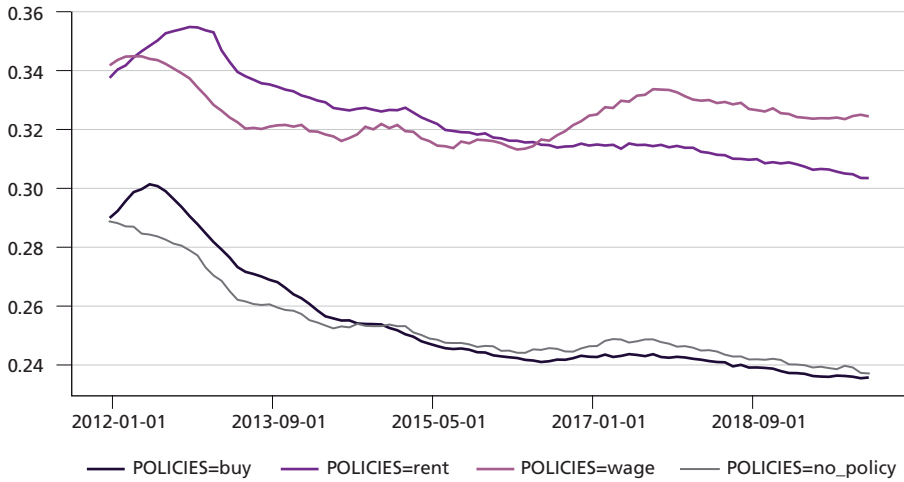
Author's elaboration.
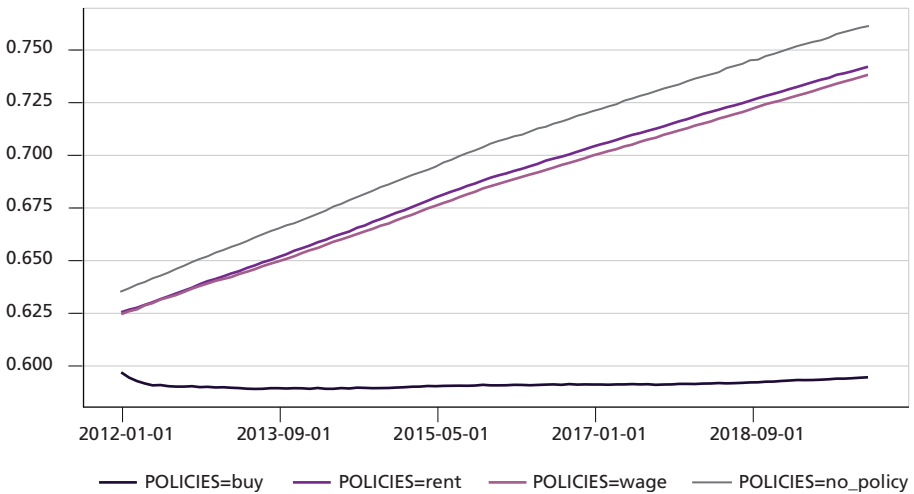Obs.: Agents – 1.0% of population.

FIGURE 2

Price indicator for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)
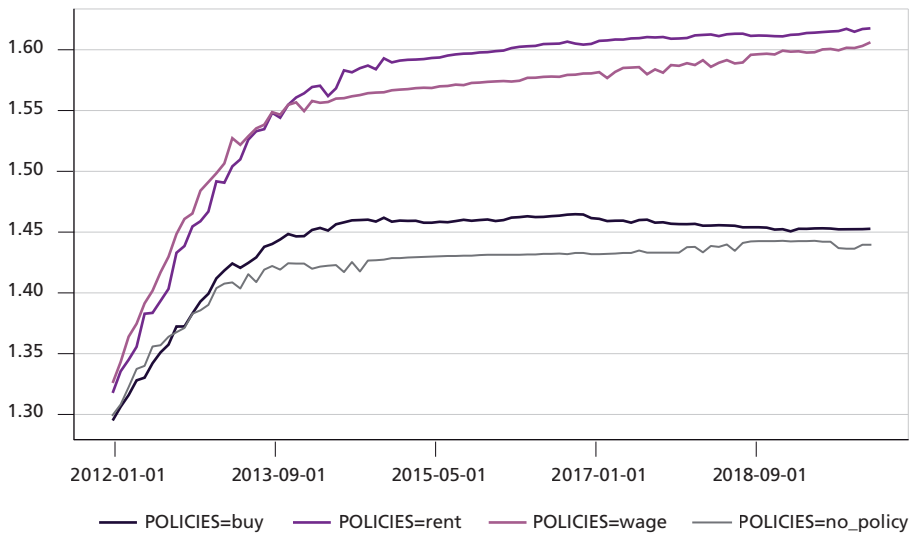
Author's elaboration.
Obs.: Agents – 1.0% of population.

The endogenous and cyclical character of the *PolicySpace2* makes it possible to analyze how the municipal collection behaves after the intervention of policies. As described, the Quality of Life Index (QLI) is the indicator that accumulates municipal investments weighted by the population and reflected in a *proxy* of better quality of life (infrastructure). As expected, given that part of the revenues (20% in the standard model) is directed to the application of policies, the "no policy" case presents the highest QLI growth value (figure 3). Aid and rent policies are capable of promoting the dynamism of the economy through household consumption (aid recipients and property owners). In a very contrasting way, the property policy, since it immobilizes the capital in the properties, affects the transfer of general resources to the municipality to the point that collection is just enough to maintain the previous levels.

FIGURE 3
QLI, which reflects the capacity of municipal investments, for the different tests of policies, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)
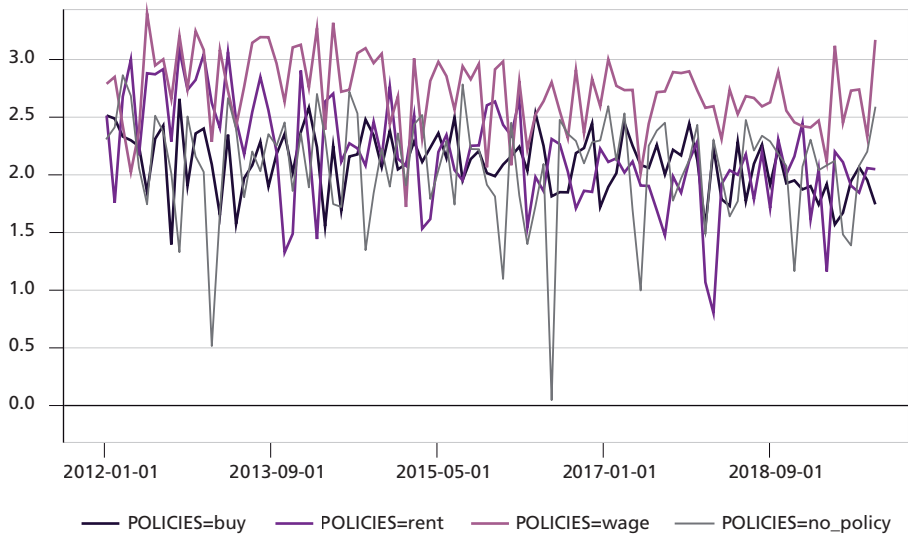

Author's elaboration.
Obs.: Agents – 1.0% of population.

Household savings and firm profits also benefit from economic dynamics. In the first case, households save more compared to the standard case for aid and rent policies, and less for the property case. The difference between the firms' profits is less pronounced, although statistics for the period indicate that the aid promotes an average profit of 2.46 – compared to 2.01 for rent, 1.96 for property and 1.87 for the case of "no policies". Additionally, all policies reduce the volatility of firms' profits, given that there is greater availability of resources and more permanent demand.

The standard deviation of firms' profit for the "no policy" case is 0.51, compared with 0.49 for rent, 0.46 for aid and 0.35 for property. In fact, probably inflated by the earnings of construction firms, property policy is significantly the most beneficial to firms' capital accumulation. The average balance sheet of firms with the property policy is 719,686 for the period, a value that drops to 694,741 with the aid policy, 692,451 for "no policy" and 692,315 for rent. In other words, the level of the last three is almost 4% lower than that reached by the property policy.
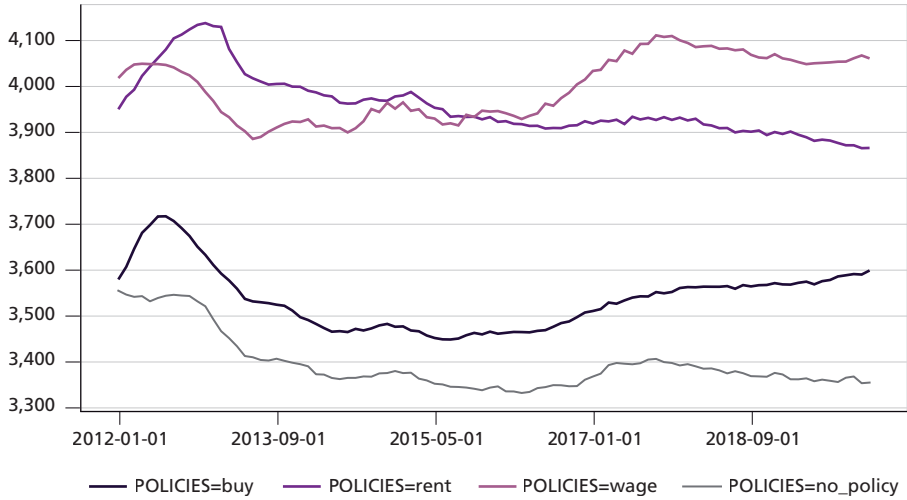
FIGURE 4

Indicator of firms' profits for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

Author's elaboration.
Obs.: Agents – 1.0% of population.

The evolution of the gross domestic product (GDP) indicator suggests that there is a persistent maintenance of gains from all policies in relation to the "no policy," with the aid policy standing out in the second half of the period, followed by the rent policy (figure 5). The property policy also shows some recovery, especially in the second half of the period, albeit insufficient (figure 6). There are no differences between the average unemployment indicators among the four tested policies.

FIGURE 5
GDP for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

Author's elaboration.
Obs.: Agents – 1.0% of population.

FIGURE 6
GDP variation for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

Author's elaboration.
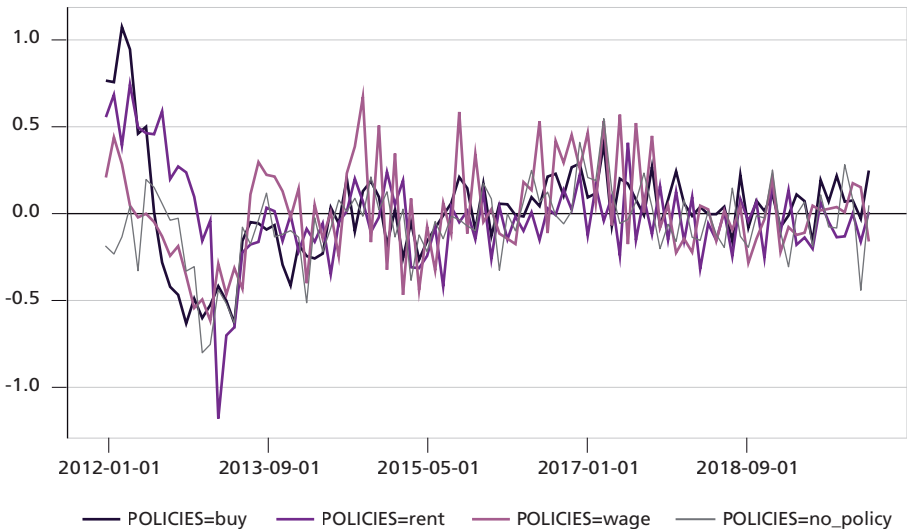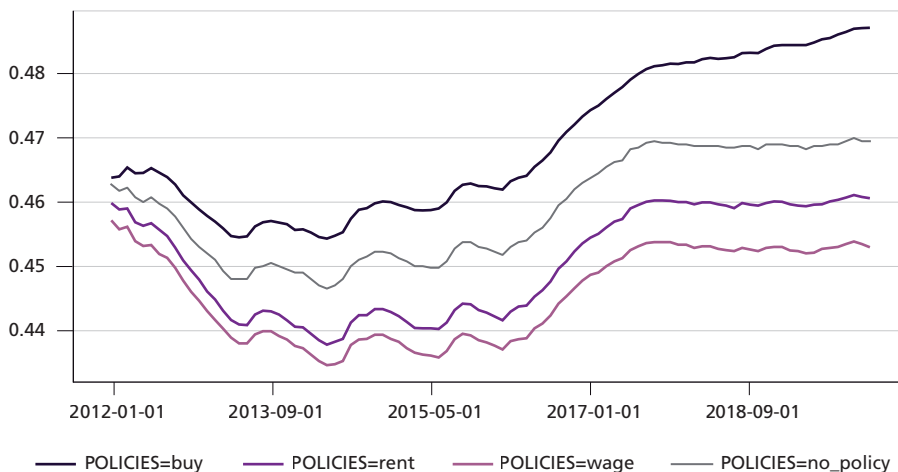Obs.: Agents – 1.0% of population.

The Gini coefficient indicates the presence of greater inequality at the end of the period successively for the policies of property, "no policy," rent and assistance (figure 7). In particular, the property policy shows increasing inequality in the last third of the period, while the remaining three alternatives remain relatively constant. Comparatively, the average of the indicator is 0.02 pp higher in the property policy.

FIGURE 7
Gini coefficient for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)
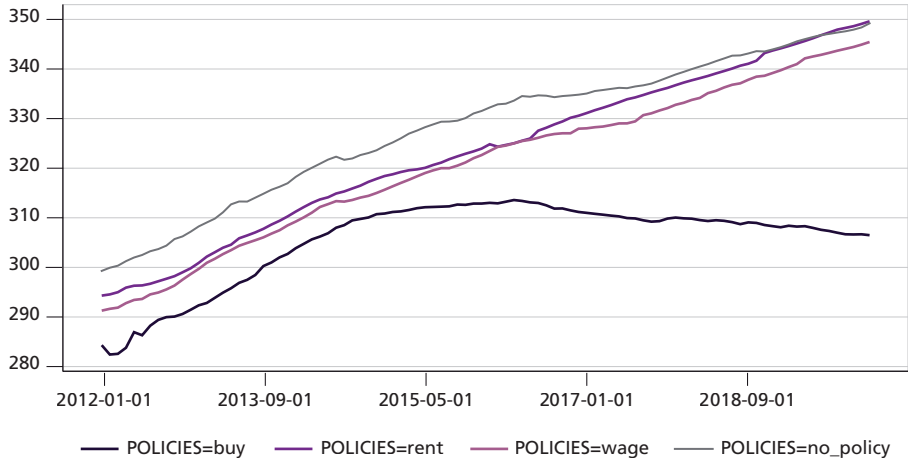

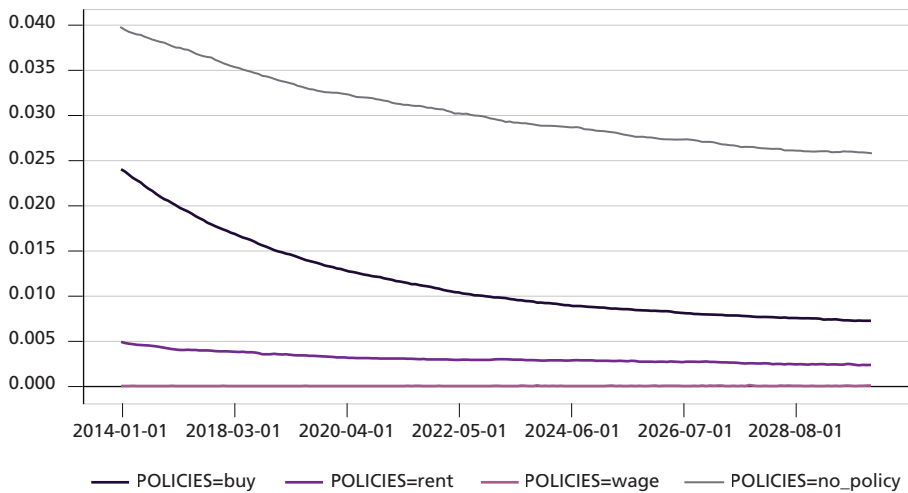Author's elaboration.
Obs.: Agents – 1.0% of population.

Property prices – according to the equations in subsection 7.7 of chapter 3 – reflect several mechanisms at the same time. In addition to the fixed characteristics of the properties, they are influenced by the supply side of the cost of the neighborhood (given by the application of tax resources – figure 3 – and population variation); the income of families residing in the neighborhood; the size of the real estate supply; and the time of the property was offered on the market. On the demand side, property prices are also influenced by household savings and obtaining mortgage loans. These combined effects generally produce a pattern of constant small increments in house prices. The property policy slightly alters this pattern and from the middle of the period it shows a maintenance trend, with a slight drop in property prices (figures 8 to 10). This effect may be due to the combination of lower appreciation of neighborhoods (lower amount of endogenously collected resources), lower savings by families in the neighborhoods and lower savings capacity in the purchase of properties. As an opposite effect, there is less vacancy when the policy is property, given that the municipality plays a relevant role as a real estate buyer.

FIGURE 8

Property prices for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

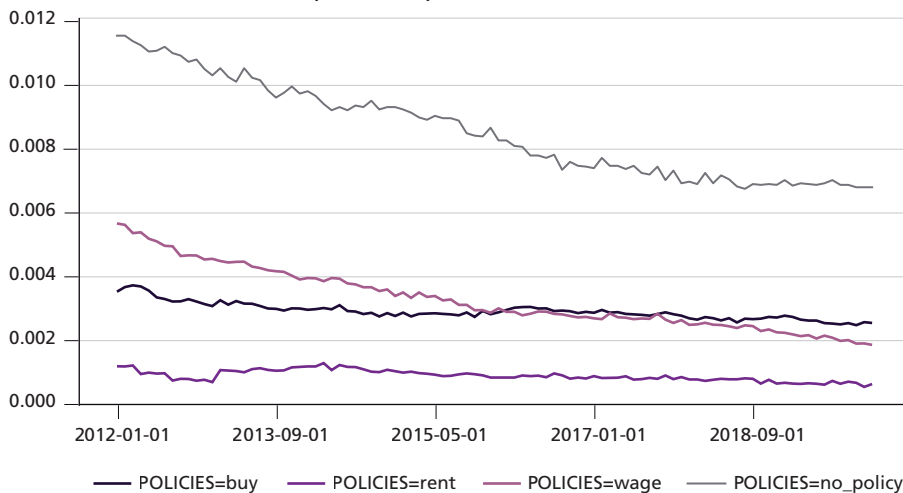Author's elaboration.
Obs.: Agents – 1.0% of population.

FIGURE 9

Percentage of families without consumption in a given month for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

Author's elaboration.
Obs.: Agents – 1.0% of population.

FIGURE 10

Percentage of families that rent and do not pay their rent to property owners for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2010-2020)

Author's elaboration.
Obs.: Agents – 1.0% of population.

2 ROBUSTNESS IN POLICY ANALYSIS

As with the sensitivity analysis of the model as a whole, we also subjected the policy tests to some variations to see if the results were unique to a given configuration or if they were repeated by default. Thus, results were tested for intra-metropolitan inequality (table 1), other cities (table 2), other periods for registering families (six months – standard and one year), other deciles for registering families (0.1 – standard, 0.2 and 0.3) and alternative simulation periods (2010-2020 – standard and 2010-2030), in addition to another spatial and familiar input base, from 2000 census data (2010 census – standard), in the long period (2000-2030). The result set confirms that the assistance policy seems to be the one with the best impact on society, followed very closely by the rent policy. The property policy generates more inequality in all simulations performed.

From the point of view of spatial analysis and inequality, the results also re-main the same. The assistance policy generates effects of lower inequality between the municipalities that make up the Population Concentration Area (ACP) of Brasília (table 1).

TABLE 1
ACPs of Brasília: Gini coefficient results for municipalities, according to policy application

Municipality	Property	Aid	Lack of policies	Rent
Águas Lindas de Goiás	0.4138	0.3538	0.3753	0.3628
Cidade Ocidental	0.4238	0.3863	0.3961	0.3888
Formosa	0.4317	0.3850	0.3996	0.3911
Luziânia	0.4484	0.3961	0.4069	0.4002
Novo Gama	0.4427	0.3761	0.3994	0.3826
Padre Bernardo	0.3905	0.3414	0.3694	0.3559
Planaltina	0.4451	0.4105	0.4303	0.4235
Santo Antônio do Descoberto	0.3953	0.3436	0.3597	0.3430
Valparaíso de Goiás	0.4444	0.3983	0.4179	0.4051
Brasília	0.4854	0.4467	0.4619	0.4521

Author's elaboration.

Among the five medium-sized cities used for comparison, the general behavior is very similar despite the very different initial territorial and family configuration, as shown by the results of subsection 2.5, of chapter 5 carried out with the same cities. However, in all of them, the Gini coefficient shows less inequality in the aid policy, with Fortaleza and Brasília also reaching the same level in the rental policy, to two decimal places (table 2). GDP and household consumption were also higher for aid, with the worst result being achieved by the absence of policy or, in the case of household consumption, tied with property policy.

TABLE 2
Average values over the entire period for selected variables in five illustrative metropolitan regions
2A – Gini coefficient

	Property	Rent	Aid	Lack of policies
Brasília	0.47	0.45	0.45	0.46
Belo Horizonte	0.42	0.41	0.40	0.41
Campinas	0.44	0.42	0.41	0.42
Fortaleza	0.44	0.42	0.42	0.43
Porto Alegre	0.44	0.43	0.42	0.43

2B – GDP

	Property	Rent	Aid	Lack of policies
Brasília	3.410,3	3.768,7	3.814,3	3.298,3
Belo Horizonte	5.664,1	6.174,4	6.326,6	5.520,1
Campinas	3.545,7	3.782,7	3.905,1	3.312,4
Fortaleza	3.684,9	3.954,9	4.025,4	3.545,3
Porto Alegre	4.052,6	4.258,0	4.341,3	3.882,2

2C – Household consumption

	Property	Rent	Aid	Lack of policies
Brasília	0.25	0.31	0.31	0.25
Belo Horizonte	0.28	0.34	0.35	0.28
Campinas	0,32	0,38	0.40	0.31
Fortaleza	0.29	0.34	0.35	0.29
Porto Alegre	0.31	0,36	0,37	0.31

2D – Price index

	Property	Rent	Aid	Lack of policies
Brasília	1.39	1,49	1,48	1,38
Belo Horizonte	1,74	1,96	2,01	1,71
Campinas	1,56	1,76	1,83	1,55
Fortaleza	1,41	1,54	1.57	1.39
Porto Alegre	1.57	1,81	1,87	1,58

2E – Unemployment

	Property	Rent	Aid	Lack of policies
Brasília	0.11	0.11	0.11	0.11
Belo Horizonte	0.13	0.13	0.13	0.13
Campinas	0.06	0.06	0.06	0.06
Fortaleza	0.10	0.10	0.10	0.10
Porto Alegre	0.08	0.08	0.08	0.08

2F – Real estate prices

|	Property	Rent	Aid	Lack of policies
Brasília	308,56	322,86	320,71	327,56
Belo Horizonte	223,44	225,13	222,86	225,78
Campinas	255,45	254,76	249,55	260,09
Fortaleza	256,47	267,39	266,32	270,93
Porto Alegre	261,24	261,14	262,09	266,59

Author's elaboration.

It is also clear that lower inequality and higher household income and savings promote a small relative increase in general prices, with the absence of policy being the least inflationary behavior – except for the case of Fortaleza, where the property policy achieves a lower price increase. In no city was there any change in the average levels of unemployment (although different from each other) due to the application of any policies. Property prices show greater variability with higher prices, but very close with the absence of policy and lower prices alternating between the other three possibilities.

In the long-term analysis, the GDP growth trend in the application of the property policy stands out (figure 11). Although it does not reach the aid policy in absolute terms, its upward trajectory signals that it would eventually surpass the GDP results, compared to aid. However, this growth in GDP takes place at the expense of increasing inequality (figure 12), while all policies project a tendency for inequality to remain at lower levels of the indicator.

FIGURE 11

GDP variation in the long simulation for the different policy tests, with an average of twenty simulations per policy for the standard case – Brasília (2000-2030)
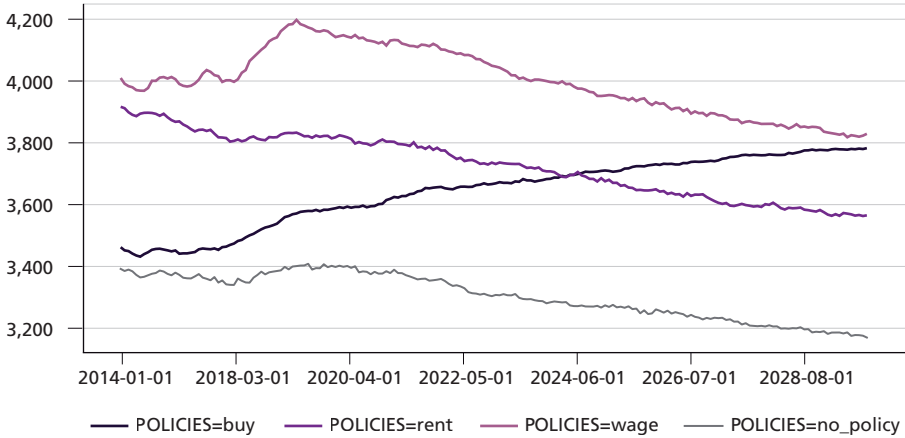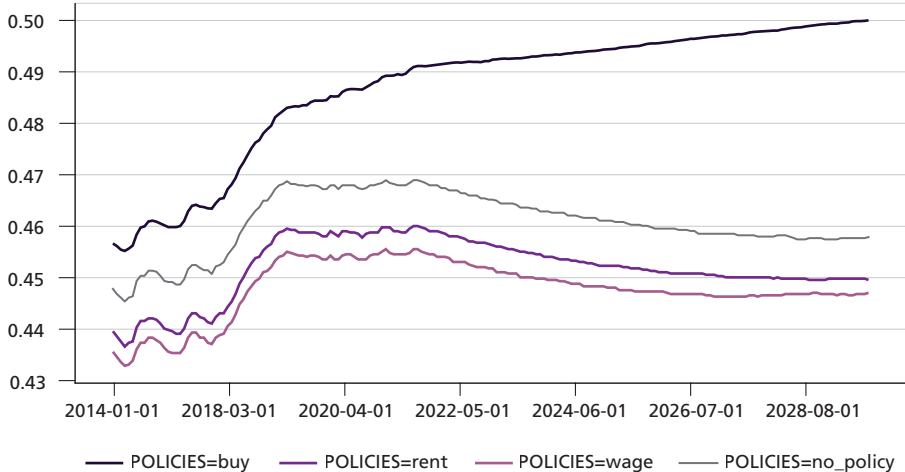

Author's elaboration.
Obs.: Agents – 1.0% of population.

FIGURE 12

Variation of the Gini coefficient in the long simulation for the different policy tests, with an average of twenty simulations per policy for the default case – Brasília (2000-2030)
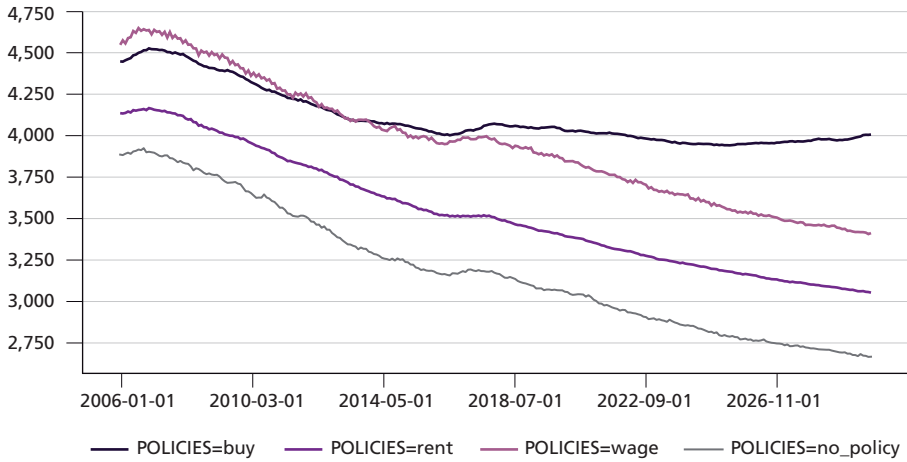

Author's elaboration.
Obs.: Agents – 1.0% of population.

Finally, from a database quite different from the others, since it uses data and spatiality from the 2000 census, the results are confirmed, with the property policy reaching a higher GDP at the end of the long period of thirty years (2000- 2030 and figure 13), but again with high inequality costs (figure 14). Thus, as in previous

analyses, it seems to us that aid and rent policies manage to deliver reasonable levels of GDP (in relation to "no policy"), with lower absolute levels of inequality.

FIGURE 13
GDP variation in the super-long simulation for the different policy tests, from the spatial and family basis of the 2000 census, with an average of twenty simulations per policy for the standard case (2000-2030)

Author's elaboration.
Obs.: Agents — 1.0% of population.

FIGURE 14
Variation of the Gini coefficient in the super-long simulation for the different policy tests, from the spatial and family basis of the 2000 census, with an average of twenty simulations per policy for the standard case – Brasília (2000-2030)
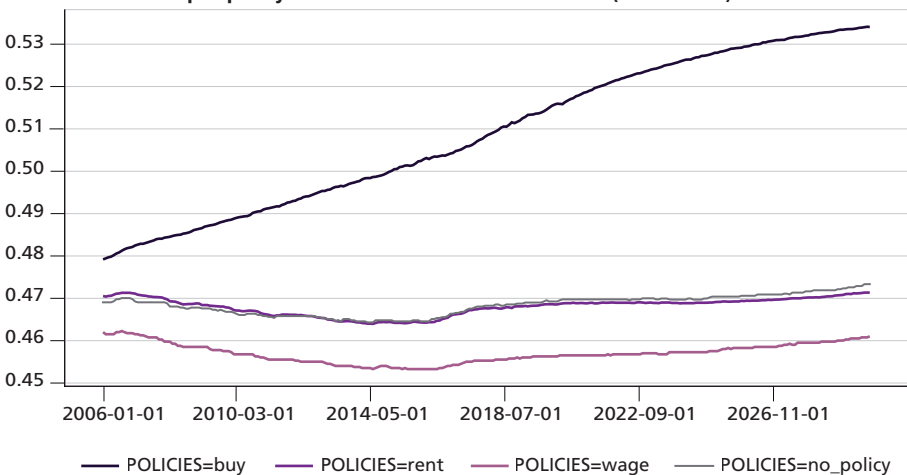
Author's elaboration.
Obs.: Agents — 1.0% of population.

3 CONSIDERATIONS ON HOUSING POLICY

With the analysis of policy tests carried out, we can say that for the simulated standard case, from endogenous processes, derived from the construction of empirical families and firms and from mechanisms in the literature, there are strong indications that the distribution of resources in the form of aid appears to be more beneficial when compared to buying and transferring real estate or promoting vouchers for rent. Specifically in terms of housing policy, the rental policy is quite competitive with the results achieved by the aid.
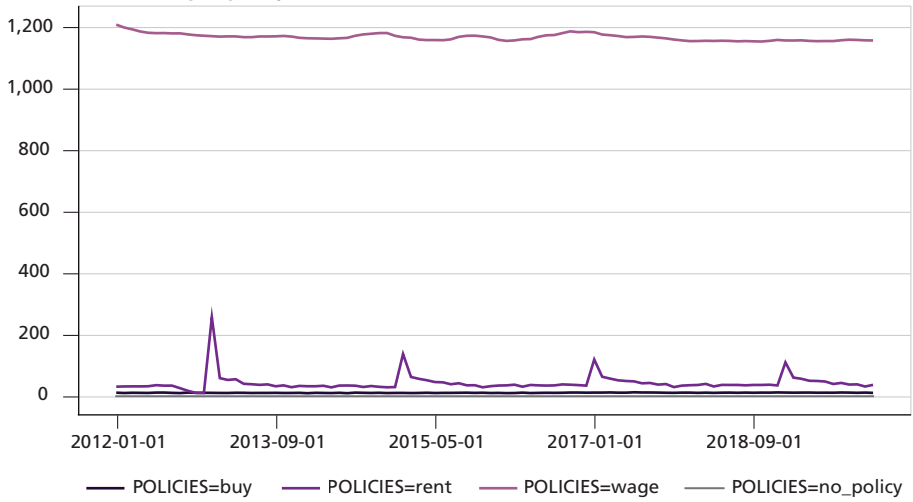
However, some more general considerations are relevant in this context. The rental policy, as shown in the graph of resources implemented monthly, is periodically renewed every 24 months, suggesting that the families who receive the resources need them to be maintained on a regular basis. This continuous demand may indicate the need for maintenance of the rental policy on an ongoing basis, even serving families that are not necessarily the same.

In turn, since the property policy requires resources about four times higher than rent per family, it serves a much more restricted number of families – and, therefore, seems to indicate high regressivity, leading to a relevant and growing increase in inequality in the population as a whole. Additionally, *PolicySpace2* seems to capture the fact that the resources invested in the property are immobilized in assets and interrupt the irrigation of resources in the rest of the economy, leading to a reduction in consumption, apparently with gains only for the construction companies, to the detriment of the industry in a more general way. This occurs even though the selection of families that receive the properties is always strictly focused, among the most vulnerable in the registry in every month. On the positive side, the property policy generates the lowest price increase effect, although it is discreet in the other policies.

From the strict point of view of housing policy, this text does not necessarily exclude the option of purchasing and distributing properties to vulnerable families. The exercise carried out only demonstrates that with the same amount of resources, endogenously originating locally in the simulated economy itself, the aid policy is clearly more progressive, with less monetary value, for a greater number of families. Among the choices of housing policies, the rental policy also seems to generate greater progressivity in relation to the property policy, although it is explicit that the "housing" issue per se is not resolved. By the way, this is not resolved with the property policy, given that the number of families that remain in the register remains relatively constant, with a small reduction, precisely in the rental policy (figure 15).

FIGURE 15

Variation in the number of families awarded each policy test, with an average of twenty simulations per policy for the standard case – Brasília (2000-2030)

Author's elaboration.
Obs.: Agents – 1.0% of population.