SPECULATION, LAND RENT, AND THE NEOLIBERAL CITY
Or why free market is not enough

If financial speculation is the possible future profit of an action performed in the present, then the risks justify the profit margin. However, this research shows that, when it comes to urban land, the future profit depends on the plot’s location and not on what is built on it. Thus, as the location is not interchangeable, the purchase of urban land involves virtually no risks. Rather than speculation, it is actually a guaranteed business.

The real estate market in Chile is clearly a liberal market, following Roca and Burns’ definition (2000). Under this logic, the negative externalities it generates for the city, the neighborhoods, or the dwellings themselves, are expected to be solved through competition and compensation on behalf of developers themselves, assuming that the market forces will be able to distribute the available resources in the most efficient possible way.

Under these circumstances, a key word appears in real estate debates: speculation, which can be defined as the time and space involved in waiting for potential profits. Its demarcation is difficult, as the national trend has taken more often the path of opinion pieces rather than that of rigorous and methodologically consistent research. The truth is that it belongs to the group of fictitious capital and securitization through banking products, such as mortgages, which are later transformed into bonds tradable in global stock exchanges, hard to track and almost impossible to retrieve (Coq–Huelva 2013, Gasic 2018, Santana 2017).

Given the access to housing process, a significant relationship is established between what we will understand as use value, which is the sum of the attributes valuation, and what is called exchange value, which is the willingness to pay through the acquisition of
debt. The hypothesis that guides this article – embodied in the model on Figure 1 – is that the latter constrains use value, enhancing the attributes regarding location within the city and occupying the monopolistic power of land, which, in turn, captures the consumer’s surplus almost completely. This is shown in the implicit phenomena of socio-spatial segregation, mobility, and accessibility to a city with proper facilities and services, among others.

Largely, this debate can be traced back to the implementation of the National Urban Development Policy in 1979, which “greatly limited the deployment of urban planning instruments” (Hidalgo, 2018) in our country. This reform – called by its promoters “modernization” – was based on the idea that the urban perimeter establishes an artificial boundary that, on the one hand, makes urban land more expensive (since it makes it scarce) and, on the other, cuts the price of non-urban land (which is plentiful, but not on the market).

FIG. 1 Modelo de interacciones para la explicación de la especulación inmobiliaria propuesta en este artículo. Elaboración propia / Interaction model for explaining real estate speculation as suggested in this article. Drawing by the author.
Accordingly, in theory, “by eliminating the perimeter, the normal economic relationship would be restored and artificial scarcity in the city would be over” (Harberger 1979). In the words of Minister Miguel Kast (1979), the main designer of this policy that liberalized urban land, this logic would work “unless the market had serious imperfections.” However, shortly after, this ideological approach revealed the flaws in its practical functioning. Indeed, two influential writings in the early eighties (Donoso and Sabatini 1980, Trivelli, 1982) established that: (1) the land market is actually imperfect; and (2) the spatial segregation that was already perceived in the city of Santiago was a consequence of real estate market operations under a deregulated logic, attacking the “achievement of the common good as a goal of a policy applied to the urban environment” (Trivelli, 1982).

“Why free market is not enough” questions, from this statement, the economic view that emerged together with the military Dictatorship and that, with variations, still persists on speculation and its impact on land markets, real estate projects, and finally the city itself.1 Thus, it aims to renew a debate that began almost 40 years ago and that, with the current housing crisis,2 has become particularly compelling today.

**Mechanics of real estate speculation**

REAL ESTATE PROJECTS AND THEIR RELATION TO LAND PRICES

Within real estate developers’ discourse, it is common to hear that there is a relationship between the price of land and the projects built on it. Thus, it is no surprise that such agents insist that the value of the land ends up directly increasing the price at which they have to sell or rent the real estate products located on it. However, this price or willingness to pay is connected to the financial capabilities of consumers and, therefore, has an upper bound determined by their capacity to go into debt. Within this reasoning, the (high) price of the land not only determines the (high) prices of real estate, but also their design, typology and constructive quality.

It does not come as a surprise, then, that for feasibility studies, the real estate developers begin with the price of the land, according to which the project’s profitability is calculated. Moreover, it is not unusual either for these operators to call for the liberalization or reduction of building restrictions on land, as a way to absorb the expenses of housing construction. To sum up, the discussion fluctuates between the real estate developers’ model for urban rent and consumers, whose purchase decision is constrained to the price of housing, associated to the bank’s credit or loan they can access.

Such a position, largely accepted by most real estate agents, is against the foundational theory of urban economy, according to which the mechanism for price formation of land is precisely the opposite: it is through uses, the intensities of use and how much individuals are willing (and able) to pay for them, what in the end affects land value. Ricardo (1819) suggested that the land does not have a value in itself, but rather
it is formed through a transfer of revenues, established by
the differential between the market price of the product it
supports and the total production costs, excluding the land.
Therefore, the more willing are the purchasers to pay for
what is developed in a certain location – considering equal
production fees – the greater the revenue that can be paid
for the land. For instance, an expensive location is more
likely to be densified in order to obtain higher incomes from
land investment. In economic terms, this is expressed by the
condition of a localized monopoly of real estate projects, a
central feature for the discussion here introduced.

**MONOPOLY RENT**

According to literature, the concept of "monopoly" is
used to describe situations "in which a company or small
group of companies has exclusive control of a product in a
certain market" (Varian, 1978). This differs from competitive
companies, whose sales are reduced to zero if they charge
prices higher than those in the market; therefore, the latter
are "price-accepting," while the former is a "price-maker."

According to Vives (1999), the crucial element in
determining competitiveness in the market is the
product’s degree of substitutability. If we consider that
an important source of differentiation for these products
is its location (Samuelson and Nordhaus, 1999), each real
estate project – since it cannot compete directly in this
sense – will constitute a ‘localized monopoly.’ Then, there
is a ‘competition’ between monopolists, who change their
markets by differentiating themselves – through their real
estate product’s design – from the basic product to the
attributes of the dwelling unit, to the building where the
unit is located (in the case of apartment buildings), and to its
environment (Roca 1988).

This article explores real estate speculation based
on the monopoly rent model studied by Harvey (2005),
which is seen in the relationship between supply and
demand established in **FIGURE 2**, and where monopolistic
exploitation manages to capture the consumer’s benefits.
Consequently, the housing market would generate such
exploitation by using location as a monopoly, generating
two side effects: the capture of the entire value in the
location and socio-residential segregation (Sabatini,
Cáceres and Cerda 2001).

**USE VALUE AND EXCHANGE VALUE**

Following the above reasoning, attributes can be
understood as those features of the real estate product
that are capable of generating differentiation in the
dwelling unit, contributing to the construction of its
value. Then, as stated by Smith (1776), this last concept
– according to its characteristics and restrictions – can be
referred to as ‘use value’ (the utility of a particular object)
or as ‘exchange value’ (expressed in the purchasing power
that the property of such object confers). These values
can relate to each other in a dialectical way, summarizing
the value elements of both purchasers and suppliers, so that
– according to Harvey (1973), who in turn was to Marx –
“they acquire meaning (they come alive, if you will) through
their relationship to another (and with other concepts).”
Regarding the latter, there are a series of analysis models aimed at explaining the mechanics that underlie a residential real estate market. The traditional economic approach – discussed in Encinas, Aguirre and Truffello (2019) – establishes a balance between use and investment associated with the general decisions behind buying and selling dwelling units, but disregards two fundamental aspects: the generation of urban space and the high level of debt among housing buyers. However, a second approach has studied this process from the point of view of use and change values (Robin 2018, Boano and Astolfo 2015, Abramo 2006), establishing concepts typical of urban economy and, especially, the effect of speculation as a derivative of exchange value.

Thus, the land as a central element establishes that the attributes of the urban space (services accessibility, transport, green areas, and so on) are reflected in its price. Also, although there is a use value, an exchange value persists as a matter of investment by third parties. This process implies the existence of a clear monopolistic exploitation in the land market, especially in circumstances of scarce regulations for the generation of urban space. This happens when the exchange value of the land exceeds by far its use value, by incorporating economic speculation with regard to a potential use associated with localized competition for a position within the city.

**STRUCTURAL EQUATIONS AND INTERACTIONS**

According to the above, the real estate price is determined from the relationship between supply price and demand price, a binomial that influences each other. This interaction will be determined by the elasticity of both prices, associated with the profit margin expected by the investor and the ability to pay or current/future income of the purchasers.

Based on the mathematical formulas developed in Encinas, Aguirre and Truffello (2019), the price of housing from the supply point of view will be associated with point (1) of Figure 1 and will integrate the investment on land and housing construction costs. On the other hand, from the point of view of the real estate purchaser, the price definition will show two possible areas: the perception of value associated with the attributes of the dwelling unit, the building, and its environment, and also the process through which they set the maximum price they could pay. Given the present debate, these elements will be associated with the concepts of use value and exchange value, respectively. Considering the exchange value as the prevailing element in the real estate equation (due to its ability to constrain the use value), we will associate the purchasers with point (2) of Figure 1.

Finally, from the equation in Figure 1, we can understand speculation as the difference between the supply price and the demand price associated with exchange value. Solving the mathematical equation, we could conclude that real estate speculation can be explained conceptually as:

Real estate speculation = exchange value - cost of land - construction costs
The empirical analysis that will be introduced next intends to reflect the key points in the formation of real estate speculation, as well as the factors that are capturing the surplus value generated along the process.

**Effects of real estate speculation on the city**

**Methodology**

This article explores the metropolitan area of Santiago, which comprises 40 districts and 1,752 census areas – considering the main consolidated urban zone (INE; MINVU 2017) – with 6,375,467 inhabitants, 2,144,706 dwellings, and an area of 83,789 hectares. Given the different dynamics of urban growth that follow real estate development and its specific aspects within the urban area, a model was developed to demonstrate the discussion already presented.

In order to prove what was stated in the structural equations, at the level of the district or census area, a database was defined containing the prices of land in the metropolitan area of Santiago, distributed in each of the areas using a regular kriging method. This method allows establishing a continuous spatial distribution of prices based on discrete references of transactions made in each of the areas.

In addition, an analysis of secondary data obtained from the Cámara Chilena de la Construcción [Chilean Construction Chamber] was established, corresponding to indices of housing prices, zoning, and building costs by component (CChC, 2019). In this sense, since construction is intensive in the use of materials and assuming that they have a large-size economy, the materials cost index would be relevant.

For the analysis, the period from 2008 to 2018 was set and several studies were developed. First, the changes in land prices per year were indexed based on 2008, coinciding with the beginning of the last economic cycle. Then, the evolution of housing prices and construction costs was analyzed in relation to land prices. Finally, a Principal Component Analysis and a Geographically Weighted Regression (GWR) was carried out, which allows estimating a territorial value range by means of local regressions.

These analyses seek to establish the relationships between socioeconomic segmentation indicators, through the socio-material territorial indicator (SMTI) and territorialized land prices. The SMTI answers to the social construction of the territory and its materiality, and results from a socio-spatial dialectic that acknowledges that it is the social component what structures the territories, while at the same time those territories shape society. The hypothesis is that there is a clear and measurable effect of real estate speculation in the last economic cycle, expressed in an increase in land prices decoupled from construction costs, in addition to being a factor for the generation of residential and social segregation.

**Spatial analysis of socioeconomic, material, and economic indicators**

The analyses of structural equations configure a monopolistic equilibrium that should be observed in the
maximization of location attributes, expressed in the power of increase in the price of land versus the cost of materials in high-rise buildings. Even within this process, given that there is a capture of the exchange value by the real estate price and the price of land, the increase in values should especially respond by replicating the city’s socio-spatial segregation.

As we observe in Figure 3, the variation is not homogeneous for the entire metropolitan area, maintaining a structure of contiguity at the district level. Likewise, Figure 4 shows a change at the census area level, showing clear differences. When analyzing the values compared to the SMTI scores (Figure 5), i.e., the socioeconomic segment, a distinct relationship can be observed. Thus, an initial relationship is established between the increase in the price of land during the period and the socioeconomic segments, which is consistent with a process of attracting exchange value through monopolistic competition in the real estate market.

If we transform the SMTI scores into values of the predominant socioeconomic sector, we can categorize each one of them. When intersecting the 1,742 census zones, its distance to the Central Business District and the variations in the price of land, measured in percentage and index number, the values in Chart 1 are obtained. The Central Business District was located in Santiago’s new financial district (consistent with the analysis by Garreton 2017), located at the confluence of Providencia and Las Condes neighborhoods, usually referred to as ‘Sanhattan.’

The values show a relation in the predominant sector higher for the segments AB and C1a regarding the
percentage variation of land prices in the period, as well as an increase in the index figure. There is an important segregation of the sectors associated with the distance of the census areas to the Central Business District, with the upper middle classes C1a and C1b being the ones that can best compete and position themselves closer to it, in a manner consistent with an economy based on services and business.10

Following this perspective, we analyzed what happened in two particular neighborhoods: Ñuñoa and Estación Central. Both districts have attracted public attention in recent years due to the media coverage on their densification and the building typologies that have populated these areas. Variations in land prices are not even in all the areas of the district (FIGURE 6), replicating thus the pattern identified at the metropolitan level, also in accordance to the analysis of Ñuñoa’s spatial model by Marmolejo, Skarmeta and Aguirre (2015) as well.

In these neighborhoods, an indicator of high-rise housing prices is operationalized and compared with the building materials price index, emphasizing its evolution during the last economic cycle. As shown in FIGURE 7, the housing price index is coupled with the land price index, while the cost of construction materials is absolutely decoupled. This shows that there is a clear relationship between the exchange values, expressed in the price of housing, and the use values, expressed in the location within the city and the district, to the detriment of those attributes linked to housing.

There is a concrete relationship between the increase in land value and the increase in housing value, especially
TABLA 1 / CHART 1
Valores promedio de indicadores para el área metropolitana de Santiago, según sectores socioeconómicos predominantes en la zona censal. / Average value of indicators in Santiago Metropolitan Area, according to predominant socio economic segments in the census zone.

<table>
<thead>
<tr>
<th>Sector socioeconómico</th>
<th>Distancia al distrito central de negocios</th>
<th>ISMT</th>
<th>Variación de precio de suelo 2008-2018</th>
<th>Índice de variación de precio de suelo 2008-2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>6,6 km</td>
<td>0,96</td>
<td>80,9%</td>
<td>1,81</td>
</tr>
<tr>
<td>C1a</td>
<td>5,0 km</td>
<td>0,93</td>
<td>86,3%</td>
<td>1,86</td>
</tr>
<tr>
<td>C1b</td>
<td>8,0 km</td>
<td>0,86</td>
<td>63,6%</td>
<td>1,63</td>
</tr>
<tr>
<td>C2</td>
<td>13,9 km</td>
<td>0,76</td>
<td>47,0%</td>
<td>1,47</td>
</tr>
<tr>
<td>C3</td>
<td>16,6 km</td>
<td>0,64</td>
<td>51,0%</td>
<td>1,51</td>
</tr>
<tr>
<td>D</td>
<td>16,8 km</td>
<td>0,54</td>
<td>54,1%</td>
<td>1,54</td>
</tr>
<tr>
<td>E</td>
<td>16,4 km</td>
<td>0,47</td>
<td>50,6%</td>
<td>1,50</td>
</tr>
</tbody>
</table>

among society’s upper-middle segments (C1a and C1b), generally closer to the central business district, and particularly in the so-called high-income neighborhoods, to which Ñuñoa belongs. On the other hand, in the neighborhood of Estación Central, the greatest increase is found in segments C3 and D (FIGURE 8).

When applying a Principal Components Analysis, including the SMTI and the land price factors, a single dimension is formed (FIGURE 9), which concentrates 75% of the variance. It encompasses with absolute clarity the census areas that have higher education rates and less overcrowding among its inhabitants, together with a better quality in housing materials and higher housing prices.

When modeling the price of land, considering a geographically weighted regression model (GWR), a set of values like the one shown in FIGURE 10 is obtained, in addition to the adjustment of indicators referring to local determination coefficients in FIGURE 11. With this model we are able to show that land prices and SMTI values in the area are two sides of the same coin: they are spatially distributed in the same way and are highly correlated. This spatial correlation reveals that the decision element is location, whose intensity is able to capture almost entirely the exchange value in the real estate equation.

FIG. 6 Números índices (2008=1) de precio de suelo, precio de vivienda en altura y precio de materiales de construcción, para las comunas de Ñuñoa y Estación Central. / Index numbers (2008=1) of land price, high-rise housing price and building materials price, for the districts of Ñuñoa and Estación Central.

FIG. 7 Números índices (2008=1) de precio de suelo según sector socioeconómico predominante para las comunas de Ñuñoa y Estación Central. / Index numbers (2008=1) of land price according to predominant socio economic segment, for the districts of Ñuñoa and Estación Central. Elaboración propia / Chart by the author.

FIG. 8 Dimensión 1 del Análisis de Componentes Principales incluyendo SMTI y precio de suelo 2018. / Dimension 1 of the Principal Components Analysis including SMTI and land prices 2018. © ocuc | Observatorio de Ciudades uc.
FIG. 9 Regresión Geográficamente Ponderada (GWR) incluyendo SMT y precio de suelo 2018. / Geographically Weighted Regression (GWR) including SMT and land prices 2018. © ocuc | Observatorio de Ciudades uc.

Condición
Condition
- 2,497,390 - 6,312,879
- 6,312,880 - 8,568,887
- 8,568,888 - 11,688,951
- 11,688,952 - 16,888,469
- 16,888,470 - 29,809,016

FIG. 10 Ajuste de indicadores de la Regresión Geográficamente Ponderada (R2 local = 0.682). / Indicators adjustment of the Geographically Weighted Regression (local R2 = 0.682). © ocuc | Observatorio de Ciudades uc.

Residual
Residual
- 0.671696 - 0.016423
- 0.016422 - 0.003122
- 0.003121 - 0.004472
- 0.004473 - 0.016864
- 0.016865 - 0.175597
Conclusions

The components and actors in the real estate segment, landlord, show a specific kind of behavior that can be characterized as monopolistic competition, whose equilibrium occurs with the valuation of a complex good and the ability to establish a differential valuation of its attributes. This process results in two measurable effects: the first is the decoupling between the price of land and other productive factors in building, such as the price of materials. The second is the generation of socio-spatial segregation processes based on the payment capacity, where high prices tend to be concentrated in space. Through the analyses here developed, the presence of both effects is observed in the districts of Ñuñoa and Estación Central, in addition to a segregation process according to the increase in housing prices, which generates real estate speculation based on the price of the land.

As suggested in the initial model on Figure 1, the interaction between supply and demand in a model of monopolistic competition results in land values (expressed as the sum of the value of the different attributes) that capture the exchange value of purchasers, expressed as their maximum debt capacity, stressing and bounding the use value of housing. This is expressed through the monopolistic power of the land, which in turn captures the surplus of purchasers almost entirely, enhancing the attributes of localization within the city. In this context, the banking system plays an important role, since it finances the agents within the system, generating financial income and capturing part of the benefits of them all. ARQ

Notas / Notes

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2 Although it is an issue that has been around for some time now in academic circles, it gained particular importance when it was publicly mentioned by the Cámara Chilena de la Construcción (CChC). In fact, in a meeting with authorities and businessmen – among which was the President Sebastián Piñera – the president of the organization, Patricio Donoso, stated: “I do not exaggerate if I say that we are facing a crisis to housing access that is soon to become a social crisis” (Pulsos, 2019).

3 The mathematical formula would be determined by:

\[ P_{\text{supply}} = P_{\text{land}} + \sum_{i=1}^{n} C_i \cdot Q_i \cdot (1+j)^i \]

where \( P_{\text{land}} \) corresponds to the price of land, \( C_i \) to construction costs, \( Q_i \) to the maximum building capacity, \( j \) to the discount rate of the real estate investor, and \( i \) to the number of construction periods.
Here, the mathematical formula would correspond to the following equations:

\[ P_{demand (use value)} = e^{\alpha \cdot A_v + \beta \cdot A_{ed} + \gamma \cdot A_e + \varepsilon} \]

\[ P_{demand (exchange value)} = \text{Savings} \cdot \#\text{months} + \text{Incomes} / \left( r \left( 1 + \frac{1}{1 + r} \right)^c \right) \]

where the price is determined, first, by the marginal appreciations (matrix of \( \alpha, \beta \) or \( \gamma \)) multiplied by the matrix of real estate attributes and, secondly, where \( f \) corresponds to the scope of the family’s maximum possible savings and incomes, \( r \) is the debt rate and \( c \) is the number of mortgage periods.

Following the equation in Figure 1, real estate speculation (\( \varepsilon \)) would be determined by:

\[ \varepsilon = \frac{\text{Savings} \cdot \#\text{months} + \text{Incomes} / \left( r \left( 1 + \frac{1}{1 + r} \right)^c \right)}{\text{ILand} - \sum \text{q}_{i,j} \cdot \text{C}_{i,j} \cdot \text{Q}_{i,j} \left( 1 + j \right)} \]

To ensure a correct modeling, an ESDA (exploratory spatial data analysis) was performed – an analysis and adjustment of the variations for each of the years where data was available between 2008 and 2018. In cases of high entropy, interpolations based on the empirical Bayesian kriging (EBK) method were chosen, which allowed improving local adjustments in areas with spatial autocorrelation and less diffusion.

Assuming that the larger the project, the greater the possibility of negotiating prices of building materials.

The SMII was developed by taking into account four indicators with territorial specificity (Rodríguez-Iglesias and López 2011), rescued from the 2017 Census through Redatam. These are: the indices of the head of household’s education; the dwelling’s materiality; the number of families in a single dwelling (allegados); and overcrowding. The logic behind calculation in the first stage follows the usual multi-criteria methodologies used by AIM, however, the operation of its indicators is done by optimal scaling from the Homals algorithm (De Leeuw and Mair 2007). The index generation assumes that the highest level of socio-materiality features a high educational level achieved by the head of household, a low level of overcrowding and allegados, and the presence and concentration of homes built with acceptable materials.

Taken from the Anglo-Saxon urban literature, the notion of Central Business District (CBD) describes the central areas of cities with better accessibility and higher economic value.

Moreover, it has been observed that starting from a monocentric model – in which all jobs are concentrated in the CBD – both economic activity (Mills, 1969) and population density (Mills and Hamilton, 1984) decrease as the distance to aforementioned centrality increases, following a negative exponential function.

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