

How knowledge on land values influences rural-urban development processes

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Abstract

This paper stresses how important knowledge of land and real estate values, their underlying variables and valuation processes, as well as control over surplus-values generation and distribution, are for successful regional and urban planning.

It discusses relations between rural and urban land, makes an analysis of the different components that underlie land value, interdependencies between land and real estate (real or potential) values, temporal perspectives of land use change, and behaviour of agents involved in development processes. Furthermore, an empirical methodology is presented in order to compute land surplus values. Conclusions are drawn concerning the implications of this analysis for regional and urban planning.

The methodology set forth is expected to support better planning decisions concerning a balanced rural-urban development, thus fuelling a stronger sustainability of rural areas.

Key-words: regional and urban planning; regional and urban economics; land and real estate markets; property valuation, surplus values.

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1. Introduction

Questions concerning the territorial planning – availability of land for different uses at reasonable prices, quality of development projects, optimal sketches, network exploration, scheduling of decisions, and confidence – are deeply important for regional and local economies. Regional and urban planning shall dispose of a monitoring system and decision tools in order to reach the main goals in land and real estate management

matters, namely: (1) warranting availability of land and real estate products needed for different functional uses, at acceptable prices; (2) avoiding excessive profits upstream and downstream the supply and demand chain of development land; and (3) asserting neutrality of landowner's interests in face of land use dynamics and changes in use intensities anticipated by planning (through parameter setting and control over surplus values distribution).

Thus, procedures should be developed in order to control and distribute the surplus-values that result from planning decisions and administrative interventions on the territory. It is also important to exert control on real estate final prices, preventing that the parameter setting of surplus values opportunistically benefit exaggerated and undue profits.

2. Determinants of land values

Land values depend on the structure of territorialisation, on the one hand, and on land policy followed by central and local authorities, on the other. They are strongly modelled by: (1) real estate property laws; (2) taxation on land and real estate; (3) spatial land uses defined by territorial plans; (4) rules for urban land production; (5) public and/or private housing promotion; (6) renting laws; (7) credit systems in real estate acquisition, (8) subsidies for home-ownership purchase; (9) woodland regime, and (10) agricultural land structure (Pardal, 2006a).

The value of a land plot can be split into two component parts: (1) the territorial-based value - that depends on its location, dimension and authorized use - is independent of landowner's intervention, results from social and territorial dynamics, and thus, can be controlled by territorial plans and other land policy tools, and (2) the value that results from owners' investment and worth, that is ruled by the market.

Within the current framework of territorial economies, taxes should exclusively fall upon the territorial-based value, with proper landmarks, in light of an informed land use policy (Pardal, 2006a).

3. Cause and effect dependencies between land and real estate values

Land prices condition real estate prices, and are simultaneously conditioned by them (Clark, 1995; Granelle, 1970; LeFeber, 1958; Thoman et al., 1968). Whenever competition exists for land uses, real estate assets' prices exert influence on land plots (George, 1879; Ricardo, 1817; Smith, 1843). Nevertheless, land also intervenes in real estate price settlement as a consequence of planning regulations and of firms and families location choices, due to land heterogeneous characteristics and competition for specific plots' use (Dunn, 1954; LaFountain, 2005; Needham, 1981). Besides, as landowners block up supply, land values strongly condition built spaces' prices through high absolute and monopoly rents that enter real estate production costs (Harvey, 1985). In Portugal, within the framework of a proper land use policy, land value should represent, in the utmost, 15% of the final real estate product value (however in exceptional centrality or attractively circumstances it may reach 25% (Pardal, 2006a)). Thus the components of land costs are the transference cost and the economic rent. But whereas the transference cost is a component of the real estate cost (and thus, enters in real estate price settlement); the economic rent is determined by the price of the real estate products. Its value is given by the difference between the price of land used as a productive factor and its transference cost (that corresponds to the capitalised revenue of its productive use) (Chacholíades, 1986). As economic land rent includes a land surplus value and an additional profit margin, it is very difficult to distinguish between rent and profit. For this reason planning shall regulate profits, considering, on the one side, the land social function and, on the other, the need to stimulate the initiatives and investments of real estate promoters, builders and sellers (Rebelo, 2008).

In real estate price formation intervene the following parcels (Pardal, 2006a): (1) gross residual land value (mastered by demand); (2) geomorphologic characteristics; (3) woody or agricultural land value (regulated by exploration rents, but often modelled by psychological factors); (4) relative location; (5) plot's dimension; (6) property division (that usually involves a rise in land prices); (7) licensed use (that depends on a political or administrative decision); (8) land use changes (the administrative decision to change agricultural into urban land, or to alter the urban parameters potentially engender surplus-values); (9) indirect surplus-values (that result from infrastructures, equipments,

public services or other undertakings); (10) demand (subdivided into useful and speculative demand); (11) real estate taxation; and (12) private investment in building and other improvements.

4. Changes in land uses

Changes from agricultural to urban land uses, the division of land property, and the expansion of the building capabilities or of the number of autonomous land plots that result either from administrative decisions (Pardal et al., 1996) or from public works engender surplus-values (the former in a straight way and the later indirectly).

The definition of urban perimeters in the territorial plans, and the way how they are faced and interpreted, may as well generate surplus values and support speculation processes. This happened in the first generation of the Portuguese Municipal Master Plans (PDM's), where many agricultural land plots were valued considering their virtual uses and parameters for mortgage credit purposes, what implied an unreal rise in their prices (Pardal, 2006b). It is expected that the "programmed areas for urban expansion", proposed by the current generation of Master Plans allow for surmounting of these artificial values introduced in the former "urban expansion areas".

When public or municipal entities acquire agricultural land, that they subsequently develop and sell, they are able to retain the surplus-values generated by their own decisions on behalf of the society in general. However, when the urbanization processes are lead by private agents, the taxation of the surplus values becomes more difficult, as it is based on anticipated presumed values.

5. Behaviours of the development agents

The production and allocation of urban space result from a complex series of decisions taken by different economic agents.

Land demand strongly depends on space needs for accommodation, and to fulfil industry, trade and services' requirements. Thus land price depends on its expected future uses (Aydalot, 1985). That is why it is so relevant the analysis of the roles played

by the different development agents: landowners, promoters / developers /builders, real estate mediators, final buyers or tenants, credit institutions and public authorities.

Promoters and builders play important roles in shaping property markets. They intervene on the production / supply side, and search for reasonable profit margins, providing a real estate final product at suitable prices, respecting the market rules, the urban regulations, and the principles of the land use policy. Real estate agents – that also include valuers, consultants and other real estate professionals - are the coordinators between buyers and sellers, thus they tend to encourage the property market turnover. They are as well an important source of information concerning real estate availability. Final consumers are mainly guided by use values and not as much by trade values. The main function of the credit institutions, by its turn, consists in the regulation of the cash flows within the property markets. Finally, as regional and local authorities are often times land owners, their role in land use management and control is particularly important. Their impact upon property markets is mainly expressed through housing provision (settled on different public programs), zoning regulations, laws, taxes, control on land use changes, and decisions on investments in infrastructures, equipments and public spaces.

However, considering the main imperfections in property markets (few participants in market transactions, lack of transparency, and monopolistic features), part of the surplus values engendered by development nourish speculative processes, escape from authorities, and are not used on behalf of society in general.

6. Empirical analysis and methodology

In order to (1) assert the availability of land for the different functional uses at acceptable prices, (2) avoid the generation of excessive profits in land and real estate markets, and (3) assure the neutrality of the landowners interests confronted with planning decisions, urban planning shall, on the one hand, intervene on property laws and, on the other, develop property appraisal tools that fit locals, uses and intensities of use. This paper proposes a methodology for the evaluation and computation of surplus-values, in order to support more efficient interventions of regional and local planning in

taxation, and in the monitoring and control of the distribution of surplus values engendered by territorial plans and regulations (Figure 1).

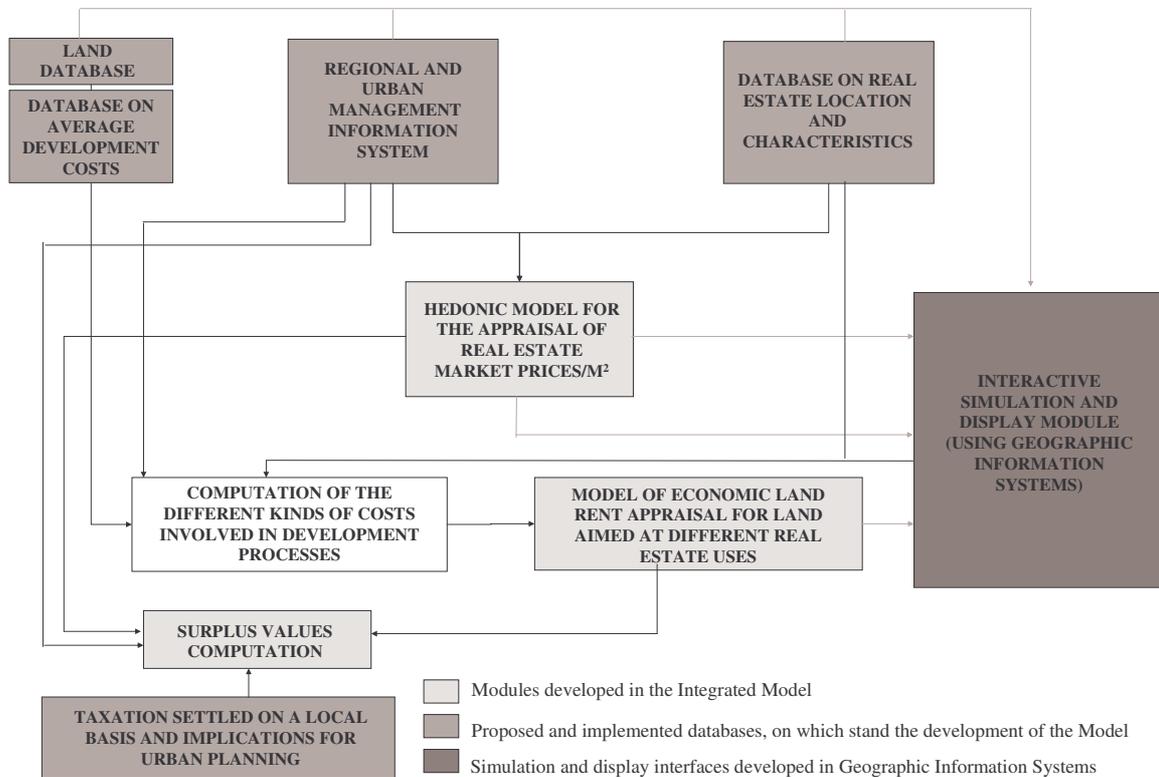


Fig. 1. Model (integrated and interactive) to support municipal decisions concerning the property markets.

This methodology consists in the following steps:

- (1) Development of an information system for on-going monitoring purposes – it is made of databases on i) land parcels, ii) average development costs, iii) regional and urban indicators, and iv) real estate location and characteristics.
- (2) Development of a methodology to compute surplus values, based on a hedonic model of market prices and on average costs of development.

6.1. Development of an information system

The land database allows for the monitoring of most variables concerning the characteristics of the parcels, as well as their real or potential uses enabled by territorial

plans and other land use policy tools. It includes the following variables: i) plot's dimension, geo-morphological characteristics, absolute and relative location (in relation to the main centre and sub-centres); ii) value of the agricultural land or woodland (computed through the exploration rents), iii) current or anticipated property division, iv) licensed use, v) real or anticipated taxes, and vi) indirect surplus values (that result from infrastructures, equipments, public services and other undertakings).

The regional and urban management information system includes indicators that translate the influences exerted on real estate supply, demand and market prices, and that are under the control of the regional and local authorities. These indicators refer to (see Rebelo, 2008): i) spatial / geo-referenced location of real estate units aimed to housing, trade and services, ii) planning regulations, namely, zoning regulations and land use coefficients, iii) location indexes of different kinds of activities, that show relative spatial concentration as compared to the overall territory, iv) weight distance to urban centres and sub-centres, v) inertia of certain functions to remain in the same location (or to change to a new location), vi) public investments concerning communications and transports, culture, sports and leisure time; public health utilities, environment; education; housing; economic development and tourism; civil protection; social action and urban (re)qualification, vii) number or density of inhabitants in each block, and viii) date.

The database on average development costs include: i) the costs of land and land-related costs, ii) the urbanization costs, iii) the building costs, iv) the management, administrative and marketing costs, v) the financial costs, and vi) the property taxes.

The costs of the land plots by square meter of building area correspond to the economic capitalized return from land use. Their computation considers the selling prices of the housing construction plots sold in public auctions (that approach the prices of land for social uses). Real estate prices for trade and services uses are weighted according to the average percentage they represent over housing prices. Land acquisition costs also include other parcels, and are expressed as a percentage of the land acquisition cost/m²: i) transfer tax (10%), ii) stamp duty (0.4%), iii) property registration costs (0.5%), iv) notarized costs (0.5%) and v) lawyer honoraries (0.5%).

The urbanization costs – that represent the costs of the land infrastructures and participation in public investments – are computed according to the municipal taxes for urban infrastructures.

The building costs properly so-called approach the selling prices/m² of common housing, annually published as a decree in the government diary. Besides, they include costs with equipments namely heating systems, lifts and special foundations, and also building honoraries. Different contingent costs (that generally go up to 5% of the total costs), as well as the building inflation, are also included in this cost category.

The management, administrative and marketing costs were assumed to represent 0.8% of total construction costs/m². Additionally, a 20% accrued added value rate fell upon those costs.

In what concerns the financial costs, it was considered an annual capital cost of 6.2%, 50% of borrowed capital for land acquisition purposes, and 50% of borrowed capital for commercialization purposes (commercialization costs were assumed to represent 0.5% of total building costs).

Finally it was applied the property municipal tax, according to the kind of use (housing, trade, industry and equipments).

The database on real estate location and characteristics assembles systematized information on characteristics, location, morphology and typology of buildings and real estate units, and respective kinds of uses.

6.2. Methodology for the computation of surplus values

In the computation of the economic rent of land for different kinds of uses the following methodology was used:

- (1) The land economic rent/m² is given by the difference, per square meter, between the expected income and a set of anticipated costs concerning land, urbanization, technical building, taxes and a normal profit rate (expressed as a multiple of those overall costs) (Rebelo, 2003).
- (2) The expected real estate selling price/m², according to respective functional use, characteristics and location can be anticipated by a hedonic model that expresses it as a function of the indicators developed in the regional and urban

management information system (Rebelo, 2008). This model can be adjusted to new and updated information, thus providing an on-going monitoring system.

- (3) A certain building area or volume is licensed in each building site, according to planning regulations and restrictions. The total expected income is, then, computed by the product among the land use coefficient or index, the licensed building area, and the real estate selling price/m² anticipated by the hedonic model¹.

The surplus values of land for the different kinds of uses were computed as the difference between the land market value and the patrimonial values (prices computed according to the municipal tax on property (see Rebelo, 2008)). The land market values are reckoned by the sum of land rent (that corresponds to the economic return on land use, previously computed), and land economic rent. But as the distinction between this computed surplus value and an additional profit is dubious, the urban planning authorities shall negotiate the distribution of the surplus values among themselves, the landowners and the promoters, builders and sellers (Pardal, 2006a).

The municipal tax on property is ruled by DL n° 287/2003 (the official valuation code) that settles the parameters for the computation of real estate reasonable prices/m², based on the application of socially-oriented principles in land policy. The tributary patrimonial-value of building land is given by the sum of the value of the building implantation surface with the value of land adjacent to construction (articles 38, 40, 41, 42 and 45). The implantation surface of buildings amounts to between 15% and 45% of the building costs (this percentage already considers location characteristics). The tributary patrimonial-value of urban buildings targeted to habitation, trade, industry and services is computed as the product among (1) the base-value of the property and (2) the gross construction area plus the area exceeding the implantation one; (3) the affectation coefficient; (4) the location coefficient; (5) the comfort and quality coefficient; and (6) the ancientness coefficient. The affectation coefficient (article 41) depends on the kind of use: trade, services, housing, social housing, warehouses and industrial activities, and parking. The location coefficient (article 42) considers accessibilities, nearness of social equipments, public transportation services, and location in expensive real estate areas

¹ It was empirically computed by the product between the average licensed numbers of floors, considering an average height of 2.7 meters, according to the general regulation of urban edifications R.G.E.U. (Regulamento Geral das Edificações Urbanas), and the selling price/m² anticipated by the hedonic model.

(however subjective this may be). The comfort and quality coefficient (article 43) of urban property for trade, industry and services purposes is positively weighted by the location in trade centres or in building offices, by the existence of central air conditioned, the building quality and the existence of lifts or rolling stairs, and negatively weighted by the inexistence of sanitary installations, water and electricity nets, sewerage system, paved streets, lifts in buildings with more than three floors and low maintenance conditions. The ancientness coefficient (article 44) relates to the age of the building.

As can be noticed in the hedonic model (Rebelo, 2008), real estate market prices/m² are an exclusive function of urban explanatory variables, what means that surplus values are only dependent on land territorial-based value, thus their taxation remains neutral in face of landowner's interests.

The methodology set forth in this paper can include new and updated information. Additionally, its simulation and cartographic interfaces allows for: i) on-going monitoring and control of factors that exert impact on property prices, ii) simulation of alternative decisions of local authorities, and cartographic display of respective surplus-values results. It is hoped it contributes to economic, financial and cartographic support to urban policy decisions, in matters such as land use and real estate management (including taxation choices), and in activities' location. It allows for the analysis, computation and display of patterns of land economic rent and surplus values, as well as respective changes that result from planning-related input variations, under a spatial perspective. It also fits other urban realities, due to its flexibility and structure.

7. Conclusions

As the surplus values are generated by administrative decisions of municipalities – that are the entities that decide on changes of land use or intensity of use, and detain the responsibility to rule land and real estate markets –, they should involve a trading process among the municipality itself, the landowners and the promoters, builders and sellers. All participants in the development productive chain should be encouraged to bring in the respective added value, thus reaching acceptable profit margins, observing market rules, urban regulations and land use policy principles (Clark, 1995; Correia,

1993; Pardal, 2006a,b). Otherwise development processes risk to be blocked either by the supply or by the demand side.

These kinds of models to evaluate, compute and quantify surplus values should inform or complement territorial plans and other land use tools, in order to appraise the impacts exerted by administrative decisions and public investments concerning land use or intensities of use,. They are proposed in this article as a basis for the application of tax policies more related to territory - founded on local intrinsic economic, social and functional characteristics. The consequences of the application of these kinds of tools for the different property agents are as follows:

- (1) Landowners can still continue to search for profits, and to have their own initiatives encouraged and rewarded. However, they are prevented from their prerogatives in land policy and cease to take advantage from their monopolistic / oligopolistic power.
- (2) Promoters / developers / builders become able to develop their activities in a more informed way, because their decisions are guided by the variables underlying demand, by the variables underlying the other suppliers' decisions, becoming thus more aware of legal and planning restrictions they will effectively face.
- (3) Property mediation agents, in their professional activities, can as well take advantage of these analysis and intervention tools. This may potentially engender a better efficiency in their decisions, what allows for a reduction in supply / demand time adjustment mismatches, probably leading to higher profit levels and/or to lower transaction prices.
- (4) They render easy the accessibility of final consumers (buyers or tenants) to real estate products that fulfil their needs, and to a wider range of choices of characteristics and location, at favoured prices.
- (5) Credit institutions will have landmarks settled on the assumptions for credit concession, thus using more realistic and social-oriented criteria.
- (6) These tools allow regional and local public authorities for: i) a more effective, balanced and informed intervention on property markets, ii) the real-time provision of land and real estate products for the different needs, iii) a better monitoring and control on property prices, iv) prevention of speculative

processes upstream and downstream the land development chain, v) assertion of the neutrality of the landowners' interests in face of land use dynamics and intensity of use changes anticipated by planning decisions, and vi) a better control over taxation mechanisms, and over the application of property taxes collection (namely through parameter setting, and control over the distribution of the surplus values).

8. Final remark

Knowledge of (1) land and real estate price formation; (2) respective cause-and-effect relations; (3) land economic rent, (4) surplus values, and (5) property agents' behaviours, reinforce the role of planners and decision-makers in ruling, guiding, coordinating and controlling land uses. This planning-centralized role will translate, namely, in a straighter intervention on property markets, through use of tools that assess, monitor, and display results of alternative regional and urban policies, and through a more effective application of taxation tools, settled on an objective appraisal of property values that result from planning decisions or from public investments.

I hope the reflections assessed in this article improve regional and urban policies in order to assure (1) a better balanced rural-urban development, and (2) a stronger sustainability of rural regions.

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