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Real estate and real options — A case study ☆

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Abstract

Real estate investments in emerging economies are characterized by low liquidity, slow payback and high sunk costs; enduring uncertainties about demand, price/m^2 and land costs. The introduction of the real options methodology in their analysis considers a housing development as an investment opportunity encompassing several options regarding information acquisition, deferral and abandonment.

The model proposed values these managerial flexibilities and shows improved risk management, identifying the optimal strategy (simultaneous vs. sequential) and timing for the construction phases. The maximum rent to pay for the exclusive rights on the land is also determined, a less capital intensive alternative to land ownership.

JEL classification: G13; R20; D81

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1. Introduction

Real estate developments in emerging economies present tight working capital, low liquidity, slow payback, capital intensive outflows that are not immediately recovered, and short to medium

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construction times. For the long run, these investments are attracting the interest of a banking sector, searching for more attractive returns and the diversification of its portfolio.

There are also several uncertainties related to demand, sale prices, land costs, unsold inventories, and regulatory and local government risks (authorizations, occupancy permits, etc.), which increase the investors' perceived risk. It is necessary to have good expertise of a constantly changing regulations on rent, taxes, project licenses, etc., which increases the administrative costs of projects.[1] Examples of buildings with their occupancy permits revoked even after being already issued are frequent in the sector.

Simultaneous and sequential investments are common in the real estate market. The first strategy is usually implemented during periods of increasing demand and implies lower construction costs but, in turn, carries more uncertain returns. Bitter experiences with residential housing developments and mega-entertainment resorts that started simultaneously, have generated profits only after five or more years of construction.

On the other hand, sequential strategies face the risks in sequence, with relatively smaller increments at every phase of the project, but at the expense of higher construction costs. However, in order to take full advantage of the sequential strategy, real estate enterprises must own the land for future developments or possess the exclusive rights on the serviceable land[2] (a less capital intensive alternative).

Sequentiality of investment introduces several characteristics common in option pricing, i.e., decisions that can or cannot be exercised by the housing developer in the future. The most relevant real options found in this kind of projects are:

- Information option. How the success/failure of the first construction phase (first launch) will affect the performance and expectations of the next development phases.
- Waiting option. For the next phase of the construction if the market does not positively receive the previous launch.
- Abandonment option. In case of high cost/benefit ratio.

Real option theory provides a methodology to better value investment projects in the presence of these managerial flexibilities. A detailed description of the different types and methodologies can be found in Dixit and Pindyck (1994) and Trigeorgis (1999). Also, Schwartz and Trigeorgis (2004) include classical readings where real options have been applied in several investment projects to account for the value of flexibility where traditional net present value (NPV) is unable to. Trigeorgis (1993) studied the interaction among several real options embedded in a single project, showing the non-additivity principle of their individual values.

Lander and Pinches (1998) identified the lack of mathematical skills, restrictive modeling assumptions, and increasing complexity as the main obstacles to the practical implementation of the real options approach.

Past failures and increasing uncertainties have also led real estate management to intuitively apply real options concepts. This essay develops a real options model for investment analysis in real estate that determines both the optimal investment strategy (simultaneous vs. sequential), by identifying the critical cost/m^2 where there is no incentive for a housing development in stages,

[1] This is known as regulatory risk, which is common in emerging economies.

[2] Exclusive rights are considered as the amount to pay to the landowner in order to assure the developer the exclusive availability of the lot to be used in the next phase of the construction during a certain period of time.