Real Option Premium in Hong Kong Land Prices

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Background

Property valuation based on net present value without flexibility taken into account has been criticized as being static. It undervalues the project or investment because it does not take into consideration the option of the owner to defer, abandon, expand, contract or switch project developments or investments. There have been numerous studies to apply the seminal Black-Scholes formula (Black and Scholes, 1973) in pricing financial options. Many other studies have applied the option pricing methodology in valuing non-financial or real assets. Amram and Kulatila (1999) illustrates the idea with a portfolio of applications including valuation in start-up business, oil exploration, developing a drug, buying flexibility, vacant land, and infrastructure investment. Copeland and Antikarov (2001) argue that “in ten years real options will replace NPV as the central paradigm for investment decisions”, and so does Miller (1999). Yet, the application of real option pricing methodology in valuation of property development and investment in particular has appeared not until the mid-eighties (Titman, 1985 and Williams, 1991). The project adopts the general continuous Black-Scholes model in the more general case of the property sectors in Hong Kong.

Significance of the Project

The property sector has always plays a pivotal role in the sustainable economic development of Hong Kong. There has been phenomenal rise of service industries in Hong Kong, and in particular the FIRE (finance, insurance and real estate) sub-sector. The working population employed in the FIRE and business sector alone accounted for 22% of total service employment in Hong Kong. The value added from this sector to the GDP grew at an average rate of 17.9% between 1997 to 1998, which is 2.2% higher than the average growth rate of all services between the period. This sector has also recorded the highest product per worker. Foreign investors have been instrumental in stimulating this growth of service sector industries in Hong Kong with the focus skewed to industries like FIRE services promising higher returns. This study will contribute to the FIRE industry with a rigorous assessment on real option pricing models as a valuation tool for the industry. As Titman (1985) argued, ‘how uncertainty about future real estate prices affect current real estate activities has important policy implications’. Option pricing addresses the particular issue of uncertainties and the consequent opportunities that are available to owners and investors to seize upon if they could defer their decisions. It has the potential of going a long way to explain the ‘gut feeling’ of investors who pay seemingly prices higher than what a traditional net present value calculation would have indicated, or why owners whose land or properties are resumed by the authorities have a point when they ask for more compensation on the ground that they are forced to sell thus losing the opportunity to wait for a better time to do so. It also explains somehow why investors pay apparently premiere prices for opportunities of doing business in Mainland China where uncertainties are perceived to be many and varied. It is the opportunities that uncertainties bring that option pricing is all about. The need to explore further into this area cannot be more obvious. It is believed that option pricing methodology facilitates research that eventually leads to better understanding of investment performance and behaviour.
Aims and Objectives
The study aims to identify the imbedded option value in price of auctioned land in Hong Kong, and to propose a more accurate valuation method in predicting land price. The study empirically tests the real option pricing models based on records of residential property transactions in Hong Kong. There are three objectives to achieve. First, the study will examine how strong the real option pricing models have empirical support in the case of Hong Kong. Second, the study will identify the set of circumstances under which the models could be best applied. Third, it will suggest further areas of study to enhance the applicability of the model.

Outcome and Deliverables
Based on records of land auctions and property transactions during two periods of very different market conditions, our study concludes that land auction prices have embedded option value in waiting to develop land. Option premiums increase with implied volatilities, which go up during market downturns, suggesting that developers place higher value on the option to develop during recessions. Our study identifies the option premiums of vacant land in Hong Kong, lending empirical support to the application of option based models for more accurate land valuation under different market conditions.

References