

PRICING OF PRE-SALE PROPERTIES WITH CONSTRUCTION UNCERTAINTIES

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Property developers have increasingly used forward contracts to pre-sell their properties that are under construction in order to enhance their financial viability. This practice is prevalent especially in big cities like Hong Kong in which large-scale housing developments are popular. However, limited research has been conducted to explore the specific risks involved in forward property markets compared to that of spot property markets. This research explored the forward risks embedded in a pre-sale of property and how they affect the pricing mechanism with reference to the forward property market in Hong Kong. Preliminary study on the efficiency of the forward property market has also been conducted which shows that higher volatility is embedded in the market compared to that of the spot market.

Keywords: forward property market, pre-sale property, risks

INTRODUCTION

A forward property contract presents an agreement between a buyer, i.e. the investor, and a seller, i.e. the developer, that the buyer commits to buy a property to be completed in the future at a specified price. The transfer of rights of the said property would usually be the date of completion of the construction. Developers tend to sell their uncompleted properties through the use of forward contracts at the planning or during the construction stage in order to enhance their financial viability of large-scale housing developments. This practice has been popular in cities with high rates of population growth like Kuala Lumpur, London, Toronto, Singapore, Beijing and Hong Kong.

Despite the growing importance of the use of forward contracts for property sales, the practice is not without problems. According to the study conducted by Yang (2001) covering the sales of both forward and spot (existing) properties in the Mainland China during the 1990s, the results show that the consumers were prepared to pay a significant additional premium in order to avoid the risk of low construction quality on the properties they purchased. The study also revealed that the issue of construction quality problem in China derived not only from substandard building material used by irresponsible developers, but also decoration mismatches with what had been promised in the pre-sale promotions. Other surveys conducted in Hong Kong (HKSAR 1997, SCMP 2005) also revealed that prospective buyers were often given inaccurate, insufficient or even misleading sales information in the pre-sale brochures and show-flats.

The problem of default in the mid-way of construction also poses another problem in forward property markets. In China, a number of property developments failed to be

completed during the property boom in the 1990s. The problem of construction default was even worse in Malaysia under the so-called “Sell-then-Build” Scheme (STB). As of 31 December 2001, 526 housing projects in West Malaysia comprising of 114,553 housing units were abandoned since 1966. Apart from the financial reasons, up to 70% of the failed projects were abandoned for a host of ‘non-financial’ reasons, such as problems with squatters, disputes between developers and architects, management problems, problems with Public Works Department etc (Esha 2003).

Despite the growing importance of the use of forward property contracts, there lacks empirical research conducted to investigate its efficiency, and to distinguish the specific risks with respect to its pricing mechanism. Among the very few studies on forward property markets, Chau and et al. (2003) set up a price discovery function for the construction of a forward property contract price index. The study confirmed that a discount on the spot price is required to cover the time premium in forward property sales. However, no research so far has been conducted to investigate the pricing behavior of forward properties with reference to the specific risks.

This study is conducted to investigate whether the forward property market and spot property market¹ possess the same information efficiency with respect to their risk and pricing mechanisms. The forward property market of Hong Kong is chosen for the study as it is a pioneer of the use of forward contracts for pre-selling large-scale housing developments. Section two provides a review of the development of the forward property market in Hong Kong. The benefits offered and the risks involved specific to forward markets are discussed in section three. Section four explores the information efficiency relating to the pricing mechanism of forward property sales.

REVIEW ON HONG KONG FORWARD PROPERTY MARKET

The residential property market in Hong Kong has undergone a great change over the last two decades. Property prices shot up by seven folds since 1986 until the Asian financial crisis broke out in 1997. To cope with the surging demand of property and the scarce of land supply, developers have concentrated on constructing high-rise buildings and large-scale housing estates. With regard to financing for the huge investments, developers have increasingly secured a substantial amount of upfront capital through the use of forward contracts to pre-sell uncompleted properties. As seen from Table 1, the sale of uncompleted properties to the total number of property sales in the first-hand market has been increasing in the past ten years, from 44% in 1995 to as high as 86% in 2001.

Table 1: Number of Agreements on Sales and Purchase (ASP) in the first-hand market

<i>Year</i>	<i>Total no. of ASP</i>	<i>ASP on uncompleted properties</i>	<i>% of uncompleted properties sales to total ASP</i>
1995	6136	3027	49%
1997	7514	3979	52%
1999	13224	9824	74%
2001	11827	8043	86%
2003	18359	10811	59%

Source: Data are extracted from the Economic and Property Research Centre (EPRC).

¹ Spot property market is referred to the conventional property market selling properties which are in completion and ready for occupation.

The formal sale of uncompleted residential properties in the private market was first recorded in 1954 covering a housing estate of over a hundred blocks of 3-floor buildings (Next Magazine 2003). However, in early 60s, there were a number of developers collapsed because of cashflow problems, this had deterred the interest of potential buyers in purchasing forward properties. Until 1961 as a result of the Fu Wah Development Saga of which the buyers had to pay an excess of 30% over the original purchase price in order to complete the construction after the developer fled, the Consent Scheme was introduced by the government to guide the pre-sale of uncompleted properties in the forward market. The major requirements under the Scheme, which are distinguished from that of the conventional sale and purchase contract, that the developers must meet include:

- i Legitimate documentations are required to show the developer's financial ability to complete the development.
- ii Solicitor of the developer will hold the money as stakeholders. Payments only be made to the work certified by the architect as having been expended.
- iii. Finalized sales brochures and price lists are required to be made available to prospective buyers and the government before commence of the property sales.
- iv. Purchasers may either rescind the agreement or receive compensation if the buildings are failed to be completed on or before the date specified.
- v. Warranty must be made by the developer to ensure that "the building work is done in a good and workmanlike manner, that the materials used are good and proper."

Since the introduction of the Consent Scheme, forward property buyers have received certain protections against unscrupulous developers. It also established in Hong Kong a standard acceptable form of contract for forward sale of uncompleted properties. However, later incidences showed that the forward property risks that have to be borne by the buyers cannot be totally eliminated by the Scheme. In the surveys conducted by the Law Reform Commission of Hong Kong (HKSAR 1997, 2002), they revealed that buyers of uncompleted properties are still exposed to certain risks as a result of the inadequate and misleading sales information that the developers provided when the purchase was made. In 2003, two development projects had to be rescued after the developers failed to repay the syndicate loans when they were due (Next Magazine 2003).

BENEFITS AND RISKS OF FORWARD PROPERTY CONTRACTS

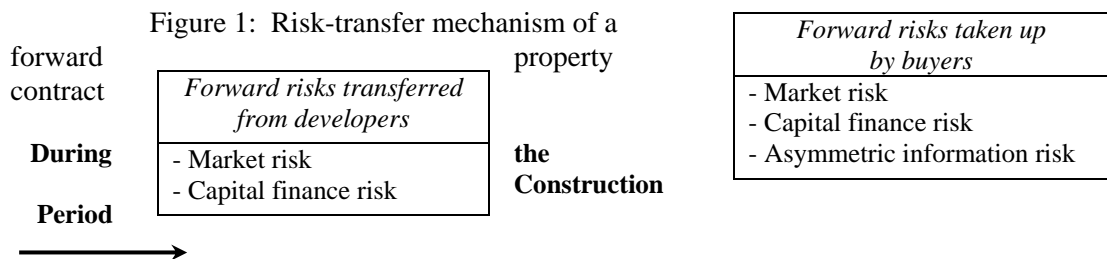
Benefits yielded from forward property contracts

Pre-sale of uncompleted properties by use of forward contracts has been a common practice and has gained increasing attention because of their distinctive advantages. From the perspective of developers, selective hedging can be attained through the use of futures markets to increase the efficiency of their price-forming process (Figlewski 1981). It not only improves cashflow of the development, it can also help developers hedge against any possible financial loss on the unsold properties when a price decline is expected by the time the construction is completed. On the other hand, if the economic sentiment favors the property market, developers can use the earnings collected from the forward sales to reinvest earlier in other construction projects to yield further returns.

On the contrary, anticipatory hedging is a more applicable explanation for a purchase of a forward property from the perspective of investors. Anticipatory hedging is guided by price expectation in which the sale contract is made in advance and the delivery of the commodity will take place upon completion of the production (Carter 1974). The purpose of the hedge is to take advantage of the current price against any price appreciation of the property in future, in particular, when a boom market is anticipated by the investors. Furthermore, forward property sales can offer more choices to both home-seekers and investors to look for their ideal dwellings/investments in terms of the location choice and the attributes available, in particular, when the spot market is experiencing a shortage of supply.

Risks of forward property contracts

Apart from the respective benefits yielded, there are also risks embedded which are specific to the forward deals. A property construction and development project involves different aspects of risks which range from unforeseen site condition, technical difficulties, poor management and adverse economic environment on sale of the final output (Flanagan and Norman 1993), and they can be broadly categorized according to their generic characteristics as operational risk, technical and technological risk, market risk and capital finance risk. The developers, being the owners of the projects, naturally, take up all the risks contained. But with the use of forward contract, they can mitigate their risks through the transfer of the equity interests of the uncompleted properties to the buyers. As seen from Figure 1, a risk-transfer mechanism of passing the market risk and capital finance risk from the developer to the buyer during the construction period has actually been operated when a forward property contract is initiated.



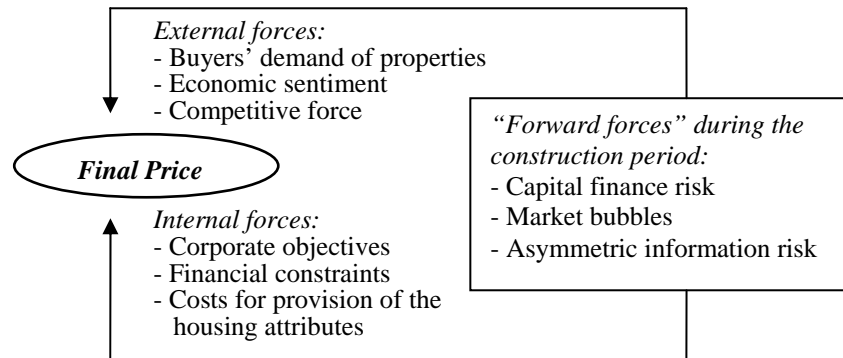
Apart from the transfer of market and capital finance risks, there also exists the principal-agent problem between the developer and the buyer. Once a forward contract is signed, the buyer becomes the principal of the uncompleted property and has to rely on the specialist knowledge of the agent, i.e. the developer, to finish the construction work. But this relationship has an inherent risk that the agent knows more about the situation than the principal. Because of the asymmetric information, the principal cannot be sure that whether their best interests are served by their agents of up-keeping the quality work after the agents have collected the money. Furthermore the agent may take advantage of switching to inferior materials to earn an abnormal return which results in overpricing of the final product. As such, the risk-transfer mechanism of a forward property contract involves not only the transfer of market risk and capital finance risk from the developers to the buyers, but the buyers have to take up the additional risks arisen from the asymmetric information which are specific to the forward market (Figure 1).

By weighing the respective benefits gained and corresponding risks borne, it is apparent that a forward property contract has put developers in a more advantageous

situation than the buyers. It not only enable them to transfer part of their project risks to other parties without incurring any loss to them, and can induce an opportunity to help them earn an abnormal return. On the other hand, forward property buyers have to weigh the benefits against the additional risks incurred before a decision is made.

FORWARD PROPERTY PRICING MECHANISM AND INFORMATION EFFICIENCY

Figure 2: Conceptual framework to pricing in forward property market



A central feature of a free property market economy is its pricing mechanism. Pricing is affected not only by nature of the product but also the market mechanism. Adapting the conceptual framework to pricing developed by Monroe (2003), a number of fundamental factors are considered necessary for price setting of spot properties as shown in Figure 2. They include the internal factors such as the costs of production and the return required by the developer, and the external factors such as the demand of housing, the economic sentiment and the choice of product attributes made available by competitors.

In determining a final price, the competitive forces would drive the internal and external forces to meet at a point at which an equilibrium price is arrived. As such, no single developer can directly influence the going price in the price-setting process. Prices are much more responsive to the relationship between aggregate demand and supply for properties based on the information possessed by the market players. Prices can also generate signals to indicate the value of individual resources which developers and prospective buyers can refer to when they make the decisions.

Regarding forward properties, its pricing fundamentals would be considered the same of that of spot properties only if the information sets available in the two markets are the same. However, in a forward property market, there is a possibility that buyers possess less than perfect information available in the spot market for the decision-making because of the asymmetric information problem. Furthermore, for the reason of supply shortage, speculation forces are considered more active in a forward property market and increase the risk of market bubbles. As such, the economic model used to approach pricing for spot properties which is underpinned by rational expectation taking into consideration of only the internal and external forces of the market cannot fully explain the pricing behavior in the forward market without inclusion of the "forward forces" (Figure 2).

Forward property price-variance test

Rational investors will choose among investment alternatives available based on the belief that the equilibrium prices will “fully reflect” the fundamental determinants contained in the information set that are available to all players in the market (LeRoy 1989). However, if there are differences in the possession of information by different market players, then different information sets will emerge in the way that some players possess the full set of information while the other only possess an asymmetric set of information. This will confer comparative advantage to the market players who possess more information and can form the basis for profitable trading (Fama 1970). Assume that Φ_S is the information set possessed in the spot property market and Φ_F is that contained in the forward property market, based on the equivalent efficient market theorem that both forward property pricing, P_F , and spot property pricing, P_S , are influenced by the same underlying factors, then it can be written as,

$$P_F | \Phi_F = P_S | \Phi_S \quad (1)$$

It follows that the information set Φ_S is “fully reflected” in the formation of the price P_S , and the price of forward properties P_F is also projected on the basis of the information set Φ_F , and if the information set reflecting the risk elements of the spot market (Φ_S) and the forward market (Φ_F) within the same property market and time horizon, the variances of equilibrium prices of the two markets (spot and forward) should possess the same information efficiency, Var , which can be written as,

$$\text{Var}(P_F) = \text{Var}(P_S) \quad (2)$$

However, if there is assumption of “forward forces” contained in the forward market, then information set Φ_F would certainly carry excess volatility compared to that of the spot market, Φ_S , written as,

$$\text{Var}(P_F) = \text{Var}(P_S) + \text{Var}(F) \quad (3)$$

In equation (3), the forward risk assumed, $\text{Var}(F)$, allegedly deals with all the forward risks in one measure. If Φ_F at time horizon t is at least as informative as Φ_S during the same time horizon under the assumption that the efficiency of the forward property market is as rational as the spot market, the variance from any excess returns would be eliminated, i.e. $\text{Var}(F) = 0$, and therefore it is irrelevant in which market that the investor engages. In the opposite, if under the assumption that the information set $\Phi_{F,t}$ is not as efficient as $\Phi_{S,t}$ and thus excess volatility is contained in the forward property market, $\text{Var}(F)$ would be high. As such, the variance test derived from Equation (3) can then be rewritten as,

$$\text{Var}(P_{F,t}) \geq \text{Var}(P_{S,t}) \quad (4)$$

Data Source

For conducting a preliminary test to study the volatility of the spot and forward markets on their information efficiency as shown in Equation (4), quarterly property

price indices from the years 1993 to 2003 are constructed using data extracted from various sources.

Spot property indices - Property price indices published by the Rating and Valuation Department of the Hong Kong Government are used as the proxy for spot property price indices. The indices are constructed using the market average prices divided by the rateable value of the subject properties in order to measure the price changes with quality of the properties being kept at a constant (HK Property Review 2004).

Forward property Indices - Forward property transactions are extracted from the Economic and Property Research Centre (EPRC) for constructing the forward property price indices. Forward properties are defined as those property sales taken place before the release of occupation permits. Since all forward properties are sold as new, adjustment in age and quality for constructing the indices is not necessary.

Property Type - The residential stock included in the study are defined as independent self-contained domestic units followed the definition adopted by the Rating Valuation Department. They are then categorized according to their size measured in saleable area² as follows:

Table 2: Classification of property by size

<i>Class size</i>	<i>Saleable area</i>	<i>Average forward sales rate (1993-2003)</i>
A	less than 40 m ²	2%
B	40 m ² to 69.9 m ²	55%
C	70 m ² to 99.9 m ²	32%
D	100 m ² to 159.9m ²	10%
E	160 m ² or above	1%

According to the classification, Class A properties are considered as small units and the total sales conducted through pre-sale from 1993 to 2003 accounted for only 2% of the total forward sales. Class D and E properties are considered as large units and only 1% of the total forward sales under the study period were large units. Whereas, Class B and C are medium units which are most popular, and they accounted for the most forward sales (over 80%) during the study period. To avoid biased effect created by outlying extreme values, the study is therefore confined to the medium size units, i.e. Class B and C.

Data Analysis

² 'Saleable area' is defined as the floor area exclusively allocated to the unit including balconies and verandahs but excluding common areas such as stairs, lift shafts, pipe ducts, lobbies and communal toilets.

Figure 3: Comparison of spot and forward Indices

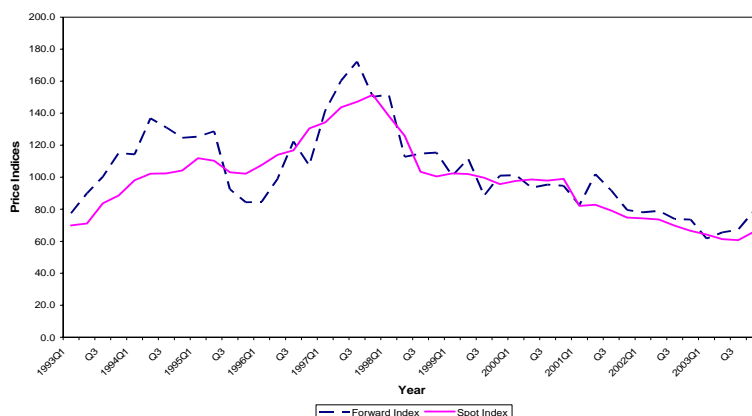


Figure 3 shows the price levels of both the forward market and spot market from 1993 to 2003 at base year of 1999. Table 3 shows the descriptive statistics of the two property indices within the study period. From the table, it shows that the range of the forward price index is wider than that of the spot index, at 110.5 and 90.7 respectively; and the standard deviation of the forward index measuring the price variability is also larger than that of the spot index, at 25.09% against 23.82%. These imply that the forward property market may have possessed price volatility higher than that of the spot market.

Table 3: Descriptive statistics of the forward and spot property indices 1993-2003

Index	Minimum	Maximum	Mean	Standard Deviation
Forward property	61.70	172.2	105.83	25.09
Spot property	60.80	151.5	97.99	23.82

Applying the Ordinary Least Square (OLS) analysis in Equation (4) in testing the significance of the price variances, the results are contained in Table 4. As expected, a coefficient significantly larger than 1 is obtained from the test which suggests that the price variance of the forward market is larger than that of the spot market at a factor of 1.0795. It implies that the forward property market, with the assumption of the additional forward risks, possesses volatility higher than that of the spot market.

Table 4: OLS results of the forward-spot indices variance test

Variable	β	SE (β)	t-value	Sig T	Adj R ²
Spot property Index	1.0795	0.0860	12.552	0.000	0.7856

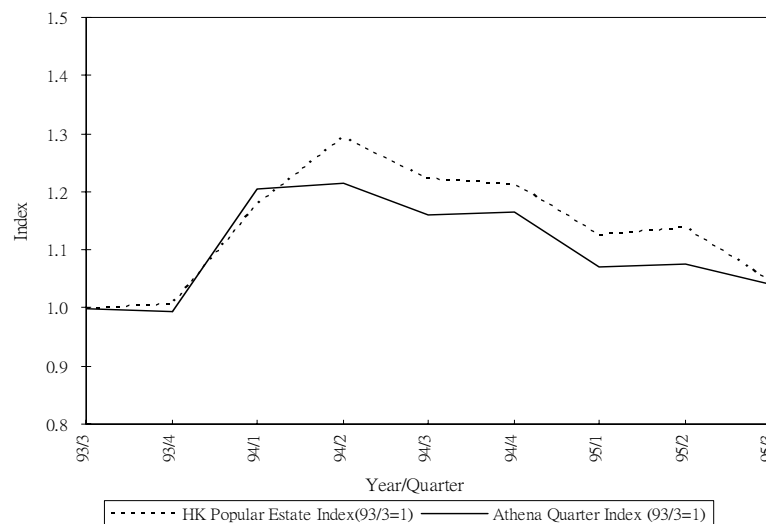
The preliminary test conducted above agrees with the assumption that forward factors, which are not present in the spot property market, are at force in the forward property market. It is observed that the price level of the forward market in Figure 3 has a higher fluctuation than that of the spot market in general. It is particularly the case when the market was experiencing boom times in 1994 and 1997, forward market displayed higher surges of prices comparing to that of the spot market.

In studying whether forward properties have been over-priced by unscrupulous developers, Figure 4 may be able to offer some clues. The figure shows the price movements of a large housing estate in Hong Kong comprising 1080 units, with their

first sales conducted in form of forward contracts when the properties were still under construction, comparing to the general price movement of the property market for the period 1993 to 1995. The values of the two indices have been scaled to unity at the 3rd quarter of 1993, at the time when the properties were offered for forward sale.

As shown in Figure 4, the property price level of the housing estate had been tracking along the market price index for the first three quarters since the forward sale was conducted. However, the price level of the estate started to drift away from the market index by the time the construction was close to completion and it fell by about 5% from the market index when the properties were completed in the 3rd quarter of 1994. Based on the risk-return equilibrium theorem, the prices index of the housing estate should track along the general property price index if the forward buyers have paid a fair price on the quality of properties stipulated in the pre-sale brochure. However, it seems the driving force for pushing up the property price of the estate upon completion of the properties was not as strong as that of the market as a whole. One of the possibilities is that the developer might have charged a premium on the housing attributes higher than the equilibrium market price by the time they made the purchase due to the asymmetric information problem.

Figure 4: Comparison between the housing estate and the general housing price indices



SUMMARY

There has been an increasing use of forward contracts to pre-sell uncompleted properties for the advantages yielded to both developers and buyers. However, limited researches have been conducted to study the additional risks they have imposed on forward property buyers. This study has outlined the risk-transfer mechanism on how developers can pass part of their project risks to the buyers, and showed the pricing mechanism of a pre-sale property with the assumption of the forward risks. The preliminary variance test has shown that the price volatility in the forward market is higher than that of the spot market which may attribute to market

bubbles and abnormal returns. Further studies will be conducted in extended scale to investigate whether the abnormal return has been caused by asymmetric information and the extent of the impact of the market bubbles.

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