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Speculation and Real Estate: Can Speculation Contribute to an Efficient Real Estate Market?

Maria Teresa Bosch-Badia

Universitat Autònoma de Barcelona, Dpt. of Business, Campus de Bellaterra, 08193 Bellaterra (Cerdanyola del Vallès), Spain
teya.bosch@uab.cat

Joan Montllor-Serrats

Universitat Autònoma de Barcelona, Dpt. of Business, Campus de Bellaterra, 08193 Bellaterra (Cerdanyola del Vallès), Spain
joan.montllor@uab.cat

Anna-Maria Panosa-Gubau **(corresponding author)**

Universitat de Girona, Facultat de Ciències Econòmiques i Empresarials, Campus de Montilivi, 17071 Girona, Spain
anna.panosa@udg.edu

Maria-Antonia Tarrazon-Rodon

Universitat Autònoma de Barcelona, Dpt. of Business, Campus de Bellaterra, 08193 Bellaterra (Cerdanyola del Vallès), Spain
mariaantonia.tarrazon@uab.cat

Abstract: *In financial markets, speculation is justified by its contribution to liquidity, hedging, and, if rationally done, adjusting price to value. Derivatives are essential for turning speculation into an element that contributes to an efficient market. Property assets have the distinctive feature of being both residential and productive assets and investment assets. This paper studies how speculation may contribute positively to the real estate market and does so by looking at it from the triple perspective of property, primitive financial assets, and derivatives. To answer this, the authors try to identify which assets are needed to achieve this end and how they can help to guide speculation towards efficiency. On this basis, we examine the development of derivatives on real estate indexes and the perspectives of their future evolution, including their impact on the real market.*

Keywords: property markets; efficient markets; speculation; property derivatives.

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Introduction

Speculation has been identified as one of the central causes of the real estate bubble. Nevertheless, it also has been shown that speculation brings positive contributions to financial markets and even to commodities markets (Angel and McCabe 2010). Of course, in these markets speculation can also be the source of certain troubles. Case, Shiller and Weiss (1993), Fabozzi, Shiller and Tunaru (2009) and Shiller (2014) regard property index futures as a way of improving the efficiency of the real estate market. Let us underline that this trading is referring to derivatives, mainly to property index futures. Nevertheless, property index futures have only received a modest acceptance in practice (Jud and Winkler 2009). So does speculation contribute to a more efficient property market or does it reduce efficiency? Should we avoid speculation in property or should we develop the necessary financial instruments that may make possible the kind of speculation that makes positive contributions to property while minimizing the negative ones? Which challenges do these financial instruments face to become successful? These are the issues we examine in this paper.

Speculation in property

We can define speculation as the financial operation that aims to turn risk into profits. Three positive contributions from speculation are widely acknowledged (Geman 2005; Culp 2010): speculation increases market liquidity, makes hedging possible, and leads to price discovery. Seeking for the difference between the current price in the future and the futures price, speculators analyse the market and estimate the expected future spot price. This is the *price discovery* function of futures contracts. On the basis of the expected future spot price, speculators estimate the futures price they regard as fair. The spot price is the outcome of the twofold interaction between supply and demand in the spot and the futures markets. Thus, the spot price incorporates not only information about current supply and demand but also information about the future. Nevertheless, speculation may also add 'noise' to prices. Noise is defined by Black (1986) as a wide array of unrelated effects that are irrelevant for value. If some investors and speculators mistake noise for information, they will trade on the basis of noise and make prices less efficient. One of the most negative consequences of speculation is that when it lacks rationality it makes bubbles grow and makes crises deeper. A bubble is a phenomenon that must be explained through behavioural finance (Malkiel 2010). Bubbles combine the irrational speculation of feedback loops with the herding behaviour of fund managers. In *Irrational Exuberance*, Shiller (2000: 60) states that a feedback loop consists of price increases feeding more price increases through increased investor demand. The herding behaviour of fund managers consists of their reluctance to sell overvalued assets when they think that the bubble will persist even for a short period.

Property

If speculators believe that they can forecast property price changes, they will take positions in property. Nevertheless, the features of property make it very unsuited to benefiting from speculation and, in addition, very vulnerable to its negative effects:

a) Property lacks the liquidity required by speculative operations. Due to its high transaction costs, the bid-ask spread of property is extremely wide compared with financial assets. Immediacy simply does not exist in property transactions. Campbell,

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Giglio and Pattak (2011) signal that transactions at efficient prices need time. According to their findings, forced sales due to foreclosures incorporate a larger discount (27% on average). On this basis it can hold that the real estate crisis and the subsequent high number of foreclosures have hindered the efficiency of the housing market.

b) Property transactions do not take place in organized markets similar to the stock market. Conversely, all of them are over-the-counter. Property buyers of real estate assets for personal use consider the specific features of each asset. Although investors may be more interested in the risk-reward combination embedded in property, even for them real estate is practically impossible to standardize and, for this reason, it is not suitable for trading in organized markets.

c) The lack of divisibility of property investments makes it difficult to diversify them, except in the case of big investors. Thus, speculation hardly can avoid the specific risk.

Nevertheless, as has been widely shown, speculators have never turned their backs on property as one of the objects of their trading. Speculation made the real estate bubble bigger not only owing to the decisions of speculators themselves, but also because property was leveraged by the financial system, which backed speculation by financing it through loans. Through speculation, property volatility increased, the bubble grew to unusual levels and the ensuing crisis became extremely deep and even ruined some financial institutions. Gentier (2012) describes the dangerous financial consequences that financing speculative property purchases had in the Spanish banking system.

In the context of a bubble, a relevant negative effect is the wrong signal that speculative demand can send out to supply. Malpezzi and Wachter (2005:160) show that the effects of speculation in property are dominated by the price elasticity of supply. On this basis they conclude that *effective policies will focus on improving the efficiency of the supply of developable land, and real estate generally, including the development of an appropriate regulatory framework for real estate*. It requires a substantial amount of time to build real estate. If an unsatisfied real demand exists, an increase in supply is certainly needed. Nevertheless, if the increase in demand is exclusively the outcome of a bubble, then any increase in production faces the risk of not matching demand when the production process has finished if in the meantime, during the production period, the bubble bursts. Producing just to meet speculative demand can be considered one of the biggest risks to builders and financing this one of the greatest errors a bank's management can make. Bankruptcy is the likely consequence of this risk if it has not been hedged and, as was seen in the aftermath of the 2007 real estate bubble. Gentier (2012) also deals with this issue.

Property index futures

Property index futures have recently been introduced into derivatives markets. The most common underlying asset is an index of property prices, such as the Investment Property Databank (IPD) UK Index Futures, traded in the Eurex exchange (Eurex) from 2009, Standard and Poors/Case-Shiller Home price index (S&P/Case-Shiller HPI) traded in Chicago Mercantile Exchange (CME) from 2006, and the Radar Logic's National Composite Index traded in the Chicago Board Options Exchanges (CBOE) from 2012. Futures contracts on

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property indices are the perfect instrument for absorbing speculation in property because they overcome the limitations that direct positions on property have for speculation. Their more relevant features are liquidity, transparent and cheap trading, diversification and perfect divisibility. Their main contributions to the property market are hedging and price discovery. The risk that property index futures may hedge is the risk of the index itself. Applying the CAPM to this case, we can make a distinction between total risk, systematic risk and specific risk. The relationship among them holds for any portfolio the condition that we can calculate the beta of each asset in the portfolio with respect to this portfolio. Thus, for any specific property we can hedge its systematic risk, but not its specific risk. This means that property futures are suitable for top-down macroeconomic speculation, but not for bottom-up microeconomic speculation. As in any futures contract we have the price discovery function. The price that speculation in property futures estimates is the expected spot price of a property portfolio equivalent to the index. Thus, we have the estimation of the future price of a portfolio. The future spot price of any specific property can then be approached through the estimated beta of this asset with respect to the index.

Market efficiency and property index futures

For the property market the main interest in price discovery is to have a reference price for the whole market. This price evolves according to everyday new information. If the market is efficient, prices are fair, i.e. they approach value. In such a market (Fama 1970), price changes cannot be forecasted because they only change when new information is received and new information cannot be forecasted for the simple reason that it is new. These properties are fulfilled more by the futures market than by the property market. Fabozzi, Shiller and Tunaru (2009, 2010) underline the importance of trading futures contracts on real estate indices in order to improve the efficiency of the spot markets. To sum up, the futures market is crucial to an efficient price discovery. Nevertheless, the efficiency that property index futures may bring to the property market has some limitations: their prices are not founded on the non-arbitrage condition and each property index has the inner limitation of a geographical zone or the kind of property it is designed for. Clayton (2007) analyses the practical difficulties of implementing property derivatives. Syz (2008) presents a wide analysis of their foundations and applications.

Price discovery and market efficiency in property index futures

In order to clarify the relationships that govern the price discovery function for property index futures, next we develop the corresponding equations. Let IN_0 be the initial value of the property index and M the multiplier of the index futures contract. Therefore, the initial spot price of the property portfolio underlying the futures contract (PR_0) is:

$$PR_0 = IN_0 M \qquad (1)$$

To formulate an equation that links the initial spot price of the underlying property portfolio and its future price, we need the risk free interest rate (r), the cost of maintaining the property (c) and the rent rate (y). Following Hull (2006) we write:

$$F_{01} = PR_0 (1 + r + c - y) \qquad (2)$$

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The maintenance cost (C) and rent (Y) are the products of the corresponding rates by PR_0, i.e. $C = c \cdot PR_0$ and $Y = y \cdot PR_0$. Considering that the maintenance cost and rent are not subject to the variability of the current price, we opt to write (2) as:

$$F_{01} = PR_0(1+r) + C - Y \tag{3}$$

Let $E(PR_1)$ be the expected spot price of the property portfolio at the maturity of the contract. The present value of the underlying portfolio is equal to the algebraic addition of the discounted values of the expected spot price, maintenance costs and yield. In equilibrium conditions, it should equate the present spot price:

$$PR_0 = \frac{E(PR_1)}{1+k} + \frac{Y-C}{1+r} \tag{4}$$

Since $E(PR_1)$ is risky, it is discounted at the rate of return (k) that incorporates the appropriate risk premium. Nevertheless, since Y and C can be regarded as certain in a short horizon, they are discounted at the risk free interest rate.

Regarding the futures price from the point of view of speculators, we can write it as the difference between the expected spot price and the risk premium in monetary units (RP) :

$$F_{01} = E(PR_1) - RP \tag{5}$$

Substituting in (3) PR_0 according to (4):

$$F_{01} = \left[\frac{E(PR_1)}{1+k} + \frac{Y-C}{1+r}\right](1+r) + C - Y \tag{6}$$

Hence:

$$F_{01} = E(PR_1)\frac{1+r}{1+k} \tag{7}$$

In the frequent case where the futures market is more liquid than the spot market, the spot price turns out to be the discounted futures price. Clearing PR_0 in(3):

$$PR_0 = \frac{F_{01} - C + Y}{1+r} \tag{8}$$

Price discovery can be synthesized through equations (7) and (8): speculators estimate the expected futures price $E(PR_1)$. They associate to it a risk premium (pr) that, added to the risk free interest rate, determines the required rate of return $(k = r + pr)$. On this basis, they decide the futures price according to(7). Finally, discounting the futures price plus the rent and minus the maintenance cost according to(8), the fair spot price is determined, i.e. *discovered.*

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The practical evolution of property derivatives and their feasibility

The evolution of property futures trading has not been as optimistic as it was expected to be at its inception. Revising the evolution of the volume of commercial derivatives traded on IPD indices we can observe a high trading volume during the real estate bubble, but a very low volume in the next years. The CME S&P/Case-Shiller HPI futures trades in 2013 were, approximately, the 10% of the trades in 2006 (See John Doland's web page, http://homepricefutures.com/blog/?p=2761). Fabozzi, Shiller and Tunaru (2010) attribute the lack of liquidity to market stability.

Comparing the S&P/Case-Shiller HPI with S&P 500 index we can draw the conclusion that derivatives that have one of them as their underlying asset have a relevant function for hedging and synthetic investment. In Table 1 we have calculated the average risk premium and its corresponding standard deviation and Sharpe ratio (for the risk premium) on the basis of monthly data for the months between January 2000 to April 2014 and April 2009-April 2014. The former captures the last period of the internet crisis, during which real estate came to be regarded as a safer and more profitable asset than the stock market. The latter captures the evolution of both markets after the real estate crisis. During the period January 2000-April 2014 the S&P/Case-Shiller HPI outperforms the S&P 500 because it has a greater average risk premium and a lower standard deviation. What matters from the derivatives point of view is that derivatives would had been extremely helpful for speculation and hedging during the bubble and for creating synthetic investment in this index as well, i.e. T-Bills plus rolling long positions in futures contracts on the index. Speculation through futures contracts on the S&P/Case-Shiller HPI would have provided an opportunity to capture the profits of the bubble without interfering in the real demand and, thus, without inducing an artificial supply. In the period April 2009-April 2014, the Sharpe ratio of S&P 500 outperforms the S&P/Case-Shiller HPI. For both periods the volatility of the S&P/Case-Shiller HPI is substantially lower than that of S&P 500 (approximately 25%).

Figure 1 shows the evolution of both indices, its moving averages of the risk premia for 12 months periods starting in January 2001 and ending in April 2014, and their corresponding standard deviations and Sharpe ratios. These figures indicate that the S&P 500 creates a better setting for short-run speculation, and, at the same time, the suitability of the S&P/Case-Shiller HPI for synthetic investment.

Table 1: S&P/Case-Shiller HPI vs. S&P 500

	Jan 2000-April 2014		April 2009-April 2014	
	S&P/Case-Shiller HPI	S&P 500	S&P/Case-Shiller HPI	S&P 500
Average rate of return	0.1489%	0.0182%	0.2978%	1.5254%
Standard deviation	1.1225%	4.5453%	1.0651%	4.0689%
Sharpe ratio	0.1327	0.0040	0.2796	0.3749

Source: *data from S&P Dow Jones Indices (http://us.spindices.com/)*

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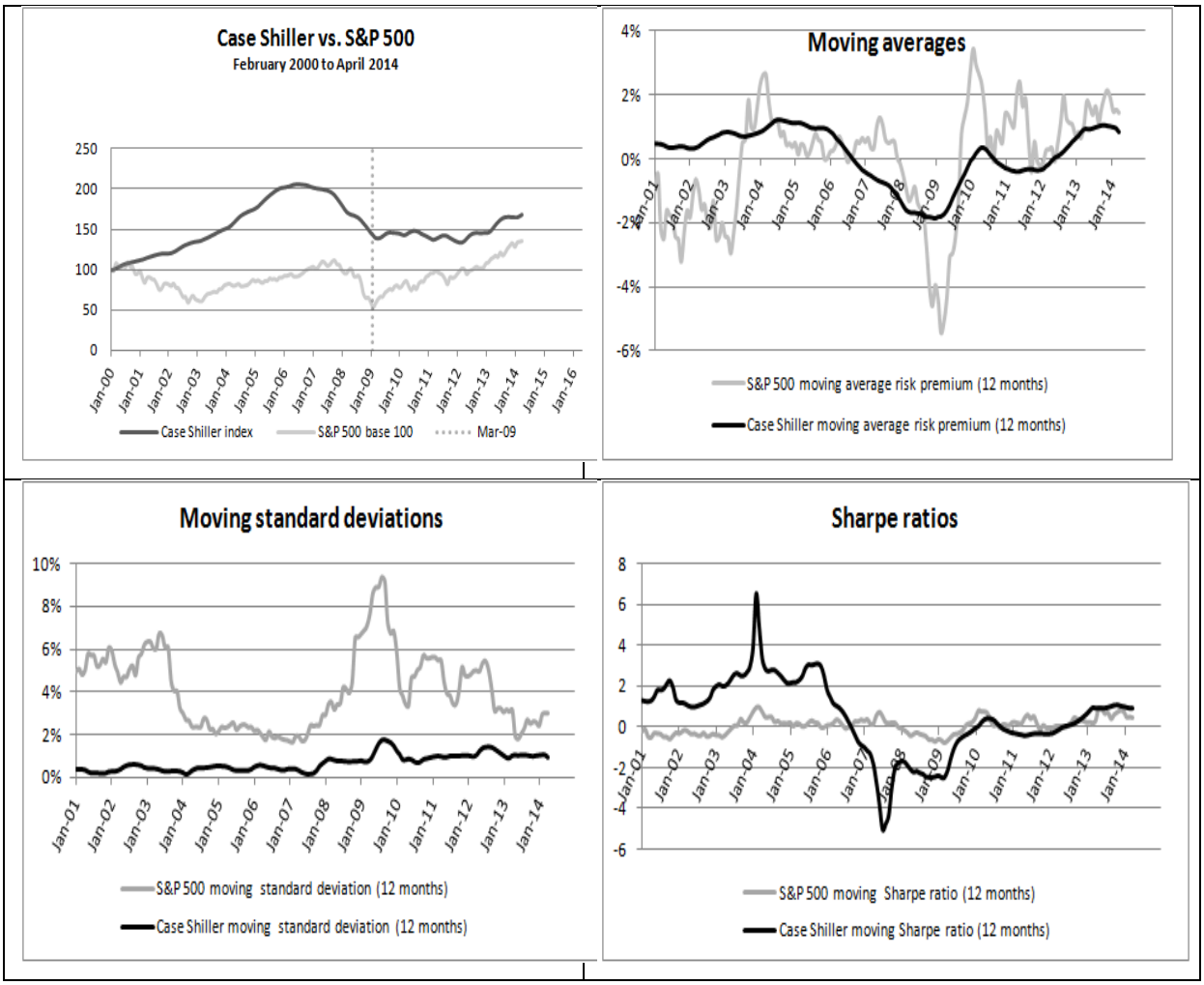
Figure 1: S&P/Case-Shiller HPI vs. S&P 500



Source: *data from S&P Dow Jones Indices (http://us.spindices.com/)*

Discussion and conclusions

The property market does not fulfil the necessary conditions for the kind of agile speculation that brings efficiency to the market. Expensive transactions, a lack of liquidity, very heterogeneous assets, the impossibility of short sales, and no organized markets that facilitate transactions prevent speculation from becoming an instrument for creating efficiency. Flexibility should come from the financial side. There we should examine the possibilities offered to the derivatives market.

Property indices are a good instrument for capturing price changes in the short run. For this reason, property index futures are, theoretically, a very appropriate instrument for use in speculating on property and for putting the price discovery function into practice. The transaction costs in futures markets are low compared with other financial markets. Thus, they constitute the perfect place for speculation on the condition that they are liquid. If speculation is concentrated in the futures market, when the market is bullish that speculation does not

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create a real demand that would actually foster an increase in real estate production. In the case of property it is crucial to separate the real demand from the speculative demand because the speculative circle is substantially shorter than the production circle. All in all, by concentrating speculation in the futures market, the real property market may benefit from the positive properties of speculation, and, at the same time, avoid the negative effects of having speculation centred on the real market. Nevertheless, the liquidity of property futures has been low in recent years. The challenge of increasing the efficiency of property markets is the need to increase the liquidity of property index futures. An important limitation on the liquidity of these contracts is the impossibility of trading directly in their underlying asset. A possible way of overcoming this limitation would be to build up a synthetic portfolio of real estate financial assets that tracks as closely as possible the property index futures under consideration. Tracking portfolio techniques are well developed in finance, although the efficiency of their applicability to property index futures remains to be investigated. By concentrating speculation in the futures market, the real property market may benefit from the positive properties of speculation, and, at the same time, may avoid the negative effects of having speculation centred on the real market. Nevertheless, the limitations due to the impossibility of hedging the specific risk that in real estate is almost impossible to diversify and the geographical limitations of property indices would remain.

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