



The nascent market for “green” real estate in Beijing

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ARTICLE INFO

Available online 3 April 2012

JEL classifications:

Q51

R31

R20

D82

Keywords:

Green building

Energy efficiency

Environmental sustainability

Information asymmetry

CHINA housing market

ABSTRACT

In recent years, formal certification programs for rating and evaluating the sustainability and energy efficiency of buildings have proliferated around the world. Developers recognize that such “green labels” differentiate products and allow them to charge a price premium. China has not formally adopted such rating standards. In the absence of such standards, developers are competing with each other based on their own self-reported indicators of their buildings’ “greenness”. We create an index using Google search to rank housing complexes in Beijing with respect to their “marketing greenness” and document that these “green” units sell for a price premium at the presale stage but they subsequently resell or rent for a price discount. An introduction of a standardized official certification program would help “green” demanders to acquire units that they desire and would accelerate the advance of China’s nascent green real estate market.

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1. Introduction

Buildings and their associated construction activities account for almost a third of world greenhouse gas emissions, and the construction and operation of buildings account for about 40 percent of worldwide consumption of raw materials and energy (Deng et al., 2012). Given that building is a long lasting durable good, choices made today in fast growing urban cities will have long run effects influencing an economy’s overall energy efficiency for decades to come.

In China’s booming cities, thousands of new housing complexes are being built. To meet soaring electricity demand, China is building a large number of new coal fired power plants. Environmentalists are worried that an unintended consequence of such growth is sharply increasing greenhouse gas emissions and worse local air quality. According to a recent calculation by Zheng et al. (2011) the average household in the least “green” Chinese city produces only one-fifth greenhouse gas emissions of that in the “greenest” city in U.S.. This fact implies that if Chinese households’ energy consumption rises to U.S. levels, the global carbon emissions would increase by more than 50 percent. Engel curve studies from around the world have documented that energy consumption rises with household income (Dargay et al., 2007). Anticipating that aggregate energy demand in China will rise sharply, China’s Premier has launched an initiative to reduce energy intensity (energy consumption per dollar of GDP) over the next five years (Decree 26th of State Council in 2011).

Raising residential electricity prices would be one direct incentive for encouraging conservation. But the Chinese government has chosen to keep such prices low. In Beijing, since the electricity pricing reform in 2003, industrial and

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commercial electricity prices have increased by more than residential electricity prices. Commercial electricity prices have increased from 0.63 yuan to 0.76 yuan per kWh and industrial-use electricity prices have increased from 0.42 yuan to 0.55 yuan per kWh. However, the rate of residential-use electricity only increased once in 2004 from 0.44 yuan to 0.48 yuan per kWh.

Rising consumer demand for green real estate offers an alternative pathway. U.S. studies have documented that more educated households are more likely to be environmentalists (Kahn, 2002). As China's major cities enjoy rising levels of educational attainment, it is likely that the demand for living in "green" housing will rise. The net effect of rising demand is that developers will have an incentive to innovate and supply such building complexes.¹

In many developed economies, such as United States, Western Europe and Singapore, etc., formal certification programs have been developed that objectively rank buildings with respect to their environmental impact and performance, hence encouraging real estate developers to supply more energy efficient and environmental friendly building complex projects. Developers recognize that such "green labels" differentiate products and allow them to charge a price premium that some consumers are willing to pay. Examples of such ratings include the U.S. Energy Star program, LEED certification and Singapore's Green Mark Schemes.²

China has not adopted a well-functioning green rating standard for its booming residential sector. In the absence of a trusted certification provider, some developers of new housing complexes are still advertising their new housing using "green" words as a marketing strategy. We use Google search to create a new data base that allows us to identify the subset of new housing complexes that are advertised as "green" in Beijing. Less well-known developers (new entrants) are more likely to market their buildings as "green", as well as developers of complexes in less desirable locations.

Apartment buyers in hot property markets in China, such as Beijing, often purchase the property at the presale stage and thus cannot verify the claims made by developers. Given the rapidly rising demand for apartments, many of these buyers are often novices who have not purchased a housing unit before. In addition, 70 percent of the new developers in our sample period (six years) only built one project. Apartment buyers will have no access to a track record for these one-time developers. An information problem arises if developers are building apartment complexes and advertising them as "green" when in fact these buildings are not going to deliver the expected energy reducing savings. This could arise due to some developers' engaging in "deceptive advertising" while in other cases, some of them may simply be ignorant about how the "green" building will actually perform due to the immaturity of the green technology it adopted.

Using hedonic pricing methods for new-unit buyers, subsequent resale-unit buyers, as well as subsequent tenants, we document that all else equal, buildings that score high on this green index sell for a price premium at the presale stage, but they are subsequently leased or resold for a price discount. We attribute such a sign flip to the lack of transparent data on the green performance of the new apartment units sold on the market, and the inexperienced buyers who lack knowledge on how the new "green" apartments will affect their future residential utility bills.

Our paper contributes to a growing literature examining the price premium for green residential and commercial real estate properties. For example, hedonic analyses set in Beijing (Zheng and Kahn, 2008) and across Chinese cities (Zheng et al., 2009; Zheng et al., 2011) indicate that residential real estate sells for a higher price in the areas that are objectively greener. This price premium is rising over time. Deng et al., (2012) study 697 individual complexes and 36,512 transactions in the Singapore housing market and find substantial price premium for the Green Mark certified buildings. Eichholtz et al. (2009, 2010) find that the intangible effects of the label itself seem to play a role in determining the value of green buildings in the marketplace. They also find that though not all of a building's energy use measured by the Energy Star label is directly linked to the ultimate energy bill, the label still yields positive effects on a building's value. However, Yoshida and Sugiura (2010) study Tokyo green condominium market and find a negative value effect related to the green label. More recently, Brounen et al. (2011) investigate how the introduction of residential energy labels in Holland has affected the price premium for "green" real estate. They find that the introduction of residential energy labels has led to a capitalization of energy efficient homes into the hedonic price gradient.

Our analysis also adds to recent works on information problems that arise in presale (or pre-construction transaction) housing markets. Chau et al. (2007) and Deng and Liu (2009) examine the moral hazard problem in presale markets in Hong Kong and China, respectively. They find that the market is able to capitalize developers' reputations into future prices, so the optimal strategy for well-established developers is to commit to the quality level implied by their reputations. However, they also find that the pre-sale practice significantly lowers the barrier of entry in the real estate industry in China, thus encouraging new comers to become involved in residential housing development.

This paper offers an innovative approach to study the nascent market for "green" real estate in Beijing. In Section 2 below, we propose a new green index to measure residential complex's "greenness" in Beijing. In Section 3, we evaluate the price premium for the "green" buildings in the nascent "green" housing market in Beijing. In Section 4, we examine these "green" building's price premium during the subsequent resale and rental stages. Section 5 concludes.

¹ See, for example, Acemoglu and Linn (2004).

² Energy Star was created by the EPA in 1992 and provides commercial building owners with strategic energy management plans designed to benefit both the environment and the property owners. LEED operates through the U.S. Green Building Council and takes a broader approach considering people, planet and profit, not just energy use. Green Mark Scheme was launched by Singapore government's Building and Construction Authority in January 2005 as an initiative to drive Singapore's construction industry towards more environment-friendly buildings.

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