



Stated WTP and rational WTP: Willingness to pay for green apartments in Sweden



Agnieszka Zalejska-Jonsson

KTH, Royal Institute of Technology, School of Architecture and Built Environment, Brinellvägen 1, 100 44 Stockholm, Sweden

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ABSTRACT

Green buildings are expected to require lower operating costs, provide better indoor environment and have a lower impact on the environment than conventional buildings. Consequently, if renting or buying green property is more beneficial, a customer may be willing to pay extra for green apartment. The aim of this paper is to study stated and rational willingness to pay for green apartments in Sweden. A database consisting of responses from 477 occupants living in green and conventional multi-family buildings was used to investigate the existence of WTP and to test the difference in opinion between respondents living in green or conventional buildings and condominiums or rental apartments.

The responses indicate that people are prepared to pay more for very low-energy buildings but not as willing to pay for a building with an environmental certificate. It was found that interest in and the perceived importance of energy and environmental factors affect the stated WTP. The results indicate that a stated willingness to pay for low-energy buildings of 5% can be considered a rational investment decision.

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1. Introduction

The European Council decision on the energy performance of buildings (2010/31/EU, 2010) not only established new goals for European Union member states but also defined the future market for construction companies. For example, Article 9a Directive 2010/31/EU clearly states that “Member States shall ensure that by 31 December 2020 all new buildings are nearly zero energy buildings”, which means that gaining competence in building energy-efficiently became an important issue for competitive companies. For the construction industry, the European Council decision was hardly revolutionary; rather, it was a confirmation that environmental issues are not just a trend but a strategic course, changing market conditions to which developers must be prepared to respond.

However, buildings constructed with environmental and energy goals require more knowledge, competence, and cooperation from design and construction teams, implying that the total construction cost for green buildings may be higher than for conventional ones (Nord & Sjothun, 2014; Zalejska-Jonsson, Lind, & Hintze, 2012). Traditionally, a profit-maximizing company facing increased cost seeks to increase its prices, which inevitably means that customers must be able and/or willing to pay for the extra cost.

Green buildings are expected to require lower operating costs, provide better indoor environment and have a lower impact on the environment than conventional buildings (Berardi, 2013; Dall, Speccher, & Bruni, 2012; Leaman and Bordass, 2007; Zalejska-Jonsson, 2012). It is rational to believe that a customer is willing to pay extra if perceived benefits from renting or buying green property are more beneficial than those from conventional buildings.

The paper aims to examine stated willingness to pay (WTP) for low-energy and environmentally labeled buildings among owners and tenants living in green and conventional multi-family buildings in Sweden. We test how apartment tenure and the importance of energy and environmental factors during apartment purchase or rental impacts the stated WTP. Since, at the point of the study, the number of green apartments on the Swedish market was limited and the information regarding transactions was unavailable, the stated WTP could not be compared to the revealed WTP. Considering these data limitations, we attempted to evaluate the rationale of investment in green building from a private investor perspective (i.e. owner) considering their stated willingness to pay.

2. The literature review

2.1. Stated and revealed willingness to pay

There is an important distinction between stated and revealed willingness to pay. The revealed WTP is based on observed behavior

E-mail addresses: agnes.jonsson@abe.kth.se, agnes.zetjonsson@gmail.com

and thus often uses transaction prices. The stated WTP are based on intended choices and based on hypothetical responses collected through survey or interviews. In this article, the analysis and discussion is based on the stated WTP. There are different approaches to investigating stated preference, one of which is a contingent valuation survey and a choice experiment. In the contingent valuation method, respondents are asked to reveal their willingness to pay in a direct question (often a binary yes/no question), whereas in a choice experiment respondents are asked to select answers from multiple alternatives (Kling et al., 2012). Contingent valuation is frequently used for assessing monetary values on environmental amenities and services (Carson, 2000). The technique is often used to obtain information when goods and services are not available on the market and therefore there is seldom actual data regarding cost and sales. The respondents are asked to reveal their preferences, which are contingent upon the hypothetical market presented in the survey (Carson, 2000). Contingent valuation (CV) may be used for assessing willingness to pay for private and public goods and service, and produced estimates might be included in market analysis, cost-benefit analysis and even judicial processes (Kling et al., 2012; Portney, 1994).

The methodical approaches to the measurement of WTP have been the subject of a long and heated debate. The critics have been pointing out problems with the underlying assumptions for contingent valuation, survey bias and the reliability of produced estimates. Firstly, opponents argue that the results from CV indicate respondents' hypothetical opinion rather than a measure of preferences for the specific project or product, questioning respondents' familiarity and understanding of the studied subject (Diamond & Hausman, 1994; Hausman, 2012). Proponents agree that CV studies place respondents in a simulated market position, but contend that this method is no different than requesting customers to purchase "unfamiliar or infrequent commodities" (Hanemann, 1994).

Secondly, opponents have argued that the quality of CV is dependent on the survey design. The critics raise the issue of wording and phrasing, the order of questions and the problem of comparability of responses (Diamond & Hausman, 1994; Hausman, 2012). They have also pointed out the hypothetical response bias that leads to producing overstated values (Hausman, 2012; Murphy & Stevens, 2004). Hausman (2012) argues that the bias in answers is often related to the specific nature of contingent valuation surveys, as respondents are asked to indicate willingness to pay expressed in specific monetary value for a certain outcome, without the possibility of different alternatives or a discussion. Moreover, the respondents are often not informed about how their answers are going to be used and therefore might be more likely to choose the answer that pleases the interviewer. Additionally, the CV surveys often face what is known as the "embedding effect" or the "scope problem". The first to explore the problem were Kahneman and Knetsch (1992), who wrote that "the assessed value for public goods is demonstrably arbitrary, because willingness to pay for the same good can vary over a wide range depending on whether the good is assessed on its own or embedded as part of a more inclusive package". The issue is broadly discussed by Diamond and Hausman (1994) and Hausman (2012). Opponents of the CV method have also questioned the accuracy of responses indicating that respondents may not be answering the question that the interviewer had in mind (Diamond & Hausman, 1994; Hausman, 2012). Additionally, the CV may not be an accurate measurement because respondents may experience a "warm glow" and express support for the good cause rather than indicating their individual preference (Diamond & Hausman, 1994). The term "warm glow" describes the private value an individual may experience by contributing to a worthy cause (Kling et al., 2012).

Advocates of CV methodology argue that by implementing CV guidelines (Carson, 2000; Portney, 1994), conducting a reliable

survey (Hanemann, 1994), and applying best practice protocols (Kling et al., 2012), the results obtained via CV can be reliable and any potential bias can be reduced. The survey bias and over-estimation of stated WTP can be reduced: when the criterion of value are clearly stated, presenting respondents with information on how the results may influence policies or strategies (Kling et al., 2012), when participants are warned of a tendency to increase the values (Cummings & Taylor, 1999) and when certainty statements are included in the questionnaire (Blumenschein, Blomquist, Johannesson, Horn, & Freeman, 2008).

Finally, the critics consider the difference between stated willingness to pay and accepted willingness to pay to be the definitive and non-dismissible argument (Diamond & Hausman, 1994; Hausman, 2012). The proponents agree that a discrepancy exists between willingness to pay and to accept, but contrary to opponents, find results in line with neoclassical economic theory and behavioral economics, explaining that the predicted properties of welfare are often different (Carson, 2012).

Proponents of CV underline the fact that hedonic models and other tests based on market data are unable to provide complete information on measures of value, particularly if the value of the commodity is at least partly unrelated to consumption of complementary goods (Hanemann, 1994). Contingent valuation can capture this value, often referred to in the literature as "existence value", "passive use value" or "non-use value" (Carson 2012; Hanemann, 1994).

2.2. WTP for green labeled buildings

Evidence of the willingness to pay for energy efficiency and environmental factors on the real estate market in the commercial property sector has demonstrated that green-labeled buildings can generate a price premium (Dermisi, 2009; Eichholtz, Kok, & Quigley, 2010a; Eichholtz, Kok, & Quigley, 2010b; Fuerst & McAllister, 2011a; Fuerst & McAllister, 2011b; Kok & Jennen, 2012). Recent literature provides evidence that higher WTP for green-labeled buildings and energy-saving measures may also be detected on the residential market. Ott, Baur, and Jakob (2006) demonstrated that prices for energy-efficient buildings, labeled with the energy and environmental label Minergie, were higher than for more conventional buildings. Results from a hedonic pricing model suggest that the price for Minergie single-family homes in Zurich was 9% ($\pm 5\%$) higher than that of comparable properties. A similar model was used in Colorado, USA, and results indicate a price premium for labeled houses, which demonstrated that Energy Star qualified buildings generated higher prices than those of comparable houses without an Energy Star label (Bloom, Nobe, & Nobe, 2011). The adaptation of an energy label to the housing market in the Netherlands and the impact of such a label on the market was the focus of a study presented by Brounen and Kok (2011). The authors concluded that the price premium for energy-labeled property depends on the energy-label level and on the fact that consumers use the information disclosed by the energy label when purchasing housing property. The analysis indicates that green labels (high-energy labels "A", "B" and "C") generate a 3.7% premium. It was found that homes with the highest energy label, "A", were sold at a 10% price premium compared with intermediate level "D"; however, homes at the lowest level "G" were transacted at a 5% discount.

A few studies have examined customers' willingness to pay (WTP) for specified energy-saving measures rather than buildings with an energy or environmental label. In Switzerland, researchers used a choice experiment to evaluate the willingness of households to pay for energy-saving measures (Banfi, Farsi, Filippini, & Jakob, 2008). A fixed logistic model was applied to data collected via telephone interviews in the summer of 2003, and results

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