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Does the first impression matter? Efficiency testing of tenure-choice decision☆

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ABSTRACT

The efficient market hypothesis states that rather than utilizing previous irrelevant information, rational decision-making is based solely on current information. In this paper, we test the efficient-market hypothesis with respect to the timing of home purchase. We use data obtained from the privatization of the public housing program in Israel to estimate the weight given to current, as opposed to the first, reduction rate offered to public housing tenants. In line with the relevant psychological literature, results indicate that the first impression generates a very effective and long-lasting imprint: only 40% weight is given to the current reduction rate, compared with 60% weight given to the first reduction rate public housing tenants encounter. When the sample period is stratified by governments in office, this weight rises (drops) to 50% (0%–30%) among tenants who accelerate (defer) the purchase. Research findings thus stress the strong reliance on irrelevant information in tenure-choice decision in response to a series of varying reduction conditions offered to tenants.

1. Introduction

The efficient market hypothesis states that rather than utilizing previous irrelevant information, rational decision making is based solely on current information. In financial markets, Kendall (1953) has demonstrated that stocks follow random-walk patterns, implying that future returns cannot be predicted by current ones.[1] His approach has been followed by Eugene Fama (1970) and further developed by John Muth (1961), and Lucas and Sargent (1981) to distinguish between adaptive and rational expectations.[2]

Many studies examining financial and real estate markets, support the adaptive rather than the rational expectation model (e.g., Smith et al., 1988; Case and Shiller, 1989). Nevertheless, to the best of our knowledge, the testing of adaptive vs. rational expectation mechanism has not been applied directly to tenure mode decisions and the timing of home purchase.

In this paper, we employ a unique sample obtained from the privatization program of the Israeli public housing stock to test the efficient-market hypothesis. Over the past decade and a half, the Israeli government sought to privatize public housing via an offer to sell rental units to tenants at a discount from the market price. The criteria utilized by the government to determine the magnitudes of the price reductions varied over time; moreover, the renewal of any price reductions or their conditions was not forecastable among targeted program participants. Tenants had the opportunity to either accept or decline government sales offers extended at each successive program iteration. Following Lucas and Sargent (1981), our research thus employs survival analysis to specify and test empirically extent to which the first impression (i.e., the first reduction rate faced by the tenant - implying adaptive expectations) matters.[3]

Results indicate that indeed (and as the common wisdom suggests), the first impression matters: only 40% weight is given to the current reduction rate, compared with 60% weight given to the first reduction rate public housing tenants encounter. In addition, we provide a complementary statistical test, which may potentially reject the null hypothesis that the estimated weight is different from one, but still tenants exhibit

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[1] This pattern suggests that financial markets are efficient. See also Brealey et al. (2011).

[2] There are two strands of the literature that evolved independently from one another but are closely related. One strand was developed by economists and finance scholars, namely, the rational expectation mechanism and the efficient market hypothesis. The other strand was developed by psychologists (e.g., Daniel Kahneman and Amos Tversky). This strand deals with cognitive errors, such as anchoring, loss-aversion and endowment effect.

[3] Arbel et al. (2014, 2016) test for the prevalence of the anchoring heuristic in timing of home purchase; and the loss aversion behavior of disabled vs. non-disabled persons residing in public housing units. The current study, however, provides a different methodology to explore a potential cognitive bias associated with the decision to purchase.

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completely rational pattern of behavior, namely, rely solely on current information. Indeed this null hypothesis is clearly rejected in all cases examined in this study.

To complete the picture, we stratify the sample by governments in power and estimate the weight given to the current reduction rate for each government separately. Results indicate that the upper bound of 50% weight given to the current reduction rate and 50% given to the first reduction rate is obtained among tenants who accelerate the purchase. Among buyers who defer the purchase, the weight given to current reduction rate drops to between 0% and 30%.

Research findings thus stress the strong reliance on irrelevant information in tenure-choice decision even among buyers who accelerate the purchase. Likewise, our study shows that the first impression, i.e., the first reduction rate offered to tenants, generates a very long memory, which may extend up to several years. This imprint has a strong impact on current decision making.[4]

The outline of the paper is as follows: Section 2 describes the sales programs and Section 3 presents the data and controls. Section 4 presents the empirical model and Section 5 provides the estimation results. Section 6 provides estimation results when the sample is stratified by governments. Finally, Section 7 provides summary and concluding remarks.

2. The sales programs

We apply unique micro data from a recent natural policy experiment to empirically examine whether the timing of home purchase is based on adaptive or rational expectations mechanism. The data span the 1999–2008 period and include six consecutive programs, which provided incentives to residents of public housing to purchase their dwelling unit.[5] The home sales programs can be described as call (real) options that allowed tenants to purchase their public rental units within a given timeframe and at a specified exercise price. The exercise prices were set as a function of the market price net of programmatic price reductions computed as percentage discounts from the market value of the asset. Each iteration of the program provides an opportunity to assess tenant behavioral response to a specified incentive structure. The panel nature of the data allows us to examine tenant response to successive program incentives, controlling for household socio-economic and demographic as well as market characteristics.

The table in Appendix A shows the origination and termination dates of each sales program and the detailed criteria by sales program for tenant offer price reductions. As is evident in the table, the duration of the sales programs varied substantially. For example, the second sales program was in effect for 41 months, whereas the fourth program lasted just seven months. Further, the criteria for determining tenant price reductions changed considerably from one program to the next. In the first sales program, price reductions were based on a variety of socio-economic household characteristics, whereas in the second program, duration of residence in public housing was the primary factor for determining the level of price reduction. By the sixth program, price reductions were based on household residence in a priority region together with family status (single persons versus couples), number of children, and disability status. Importantly, as seen in the table, both the factors weighted in the price reduction algorithm as well as the weights assigned to those factors varied from one program to the next. While current price reduction criteria were available to the public, the decision to renew the sales program as well as the timing of successive programs and future price-reduction criteria were erratic and unpredictable (see further discussion below).

As shown in Appendix B, the price reduction rates varied considerably across stratifications of the sample by various socio-demographic, disability, locational, and dwelling characteristics (including location, duration in the public housing project, number of children under 21 years old, income, and type of structure). Further, for a given stratification, the reduction rates do not appear to follow any particular pattern. The reason for these erratic and unpredictable modifications in the price reduction criteria may be attributed to a relatively high political instability and correspondingly frequent change in government in Israel and frequent modifications of governments in-power. Moreover, the acquisition of new public housing in Israel has been quite limited for more than a decade ago and the supply of units is highly constrained. Since widespread success in these programs could generate a substantial shortage in the public housing stock, most of the governments in-power were concerned about political pressure to increase the public housing stock, and many of them were implicitly or explicitly against these programs.[6]

Appendix C reports on results of four different statistical tests for unit roots in the offer price reduction time-series. Results of the analyses provide evidence that the reduction series in all panels are non-stationary. Hence we could not reject the null hypothesis that the offer price reduction time-series follow a random walk. Those findings suggest that tenants could not have forecasted the successive price reduction schemes so as to strategically exercise the purchase option.

3. Sample and controls

Data for the analysis are comprised of all public housing tenants residing in Amidar Ltd. housing units. Amidar managed approximately two-thirds of the total public housing stock in Israel in 1999 and was the largest public housing corporation in Israel during the period of analysis.[7] The raw sample includes 84.11% of the total number of the dwelling units managed by Amidar (total of 58,849 units). Further, as shown below, statistical outcomes are robust to variations in sample selection. As the decision not to purchase the dwelling unit may arise due to household financial constraints, we limit the analysis to only those households exercising the purchase option (and address potential sample selection issues in Section 4 below). The final sample thus consists of an unbalanced panel of 6,853 households.[8]

We assess the response of tenants to varying price reduction rates over a period of up to 114 months (i.e., the period of the six sales programs, March 1999–August 2008). Two main reasons justify the monthly setting over the sales program setting: 1) the latter does not weight the very dissimilar length of the different sales programs in months; 2) reduction rates may vary during the period of each sales program due to changing socio-demographic characteristics (such as the birth

[4] These results are also consistent with empirical findings in psychological studies. (e.g., Bar et al. (2006); Olivola and Todorov (2010); Mattarozzi et al. (2015); Yu et al. (2014); Zarbatany and Marshall (2015). On FMRI and first impressions, see, for example, Kim et al. (2011). On first impressions from and the intention to use websites, see, for example, Crutzen et al. (2012). This literature frequently referred to an individual's initial facial impression in a first interaction or meeting with another person. Wood (2014) reviews this literature in an effort to investigate the role of first impressions in rater-based assessments of medical students' performance. On pages 411–412 Wood (2014) mentions that: "First impressions have been found to be surprisingly accurate given how quickly they form and the limited information on which they are based (Ambady and Rosenthal, 1992; Ambady, 2010; Harris and Garris, 2008)."

[5] Note that as of September 2008, the sixth sale program is no longer valid. This program has been followed by a complete halt of all programs.

[6] Dadon (2000), for example, suggests to liquidate all the public housing stock by modifying the status of public housing tenants from renters to homeowners. She points out that highly-influential treasury officials view the sales program of the public housing stock only as a source of revenue. However, they completely ignore the high maintenance costs associated with keeping the public housing stock under government ownership.

[7] According to Dadon (2000), out of the total public housing stock of 107,927 units in 1998, Amidar managed 69,968 housing units (consisting of 64.83%). Eligibility criteria to public housing are determined by the Ministry of Construction and Housing. Two necessary (not sufficient) conditions to be eligible for public housing include no homeownership of any sort and income level (from all sources) not exceeding the minimum wage level [see Ministry of Construction and Housing (2007)].

[8] Purchasers who entered the sample after the beginning of the sample period and cases of missing information regarding rent payments have been further omitted from the sample.