

Do discounts mitigate numerological superstitions? Evidence from the Russian real estate market

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Abstract

In this paper I investigate the impact of numerological superstitions and discounts' effect on the buyers' behavior in the apartment market using actual sales data. Based on the dataset from Moscow primary real estate market, which includes 40 buildings, we test the apartments buyers' demand on lucky 7th floor and unlucky 13th floor in comparison to neighboring floors and its response to developers' discount policy for the apartments on the 13th floor. Results of the random-effects model for the preference towards 7th floor show that that "good luck" effect is present at the 90% confidence interval. Results of the mixed-effects model for the preference towards the 13th floor's apartments show that in case of discount moderation, the "bad luck" effect of the 13th floor is mitigated, while in case of "no discount" buildings we find the clear negative effect of the 13th floor.

Keywords: superstitions, jinx number, lucky number, real estate, apartments, discount

1 Introduction

Superstitions play an important role in social and economic behavior and affect everyday and business choices and decisions under risk and uncertainty. Superstitions often lead to inefficient market behavior, generating deviations from decisions made under full rationality (Tversky and Kahneman, 1974). Superstitions may lead to over- or under-estimation of different pieces of information and experience, based on irrational beliefs (Gao, Asami, Zhou & Ishikawa, 2013). Numerological and astrological superstitions affect behavior of economic agents. In Asian countries, some of them tend to be self-fulfilling; these beliefs are associated with months and years in which people are born (Akabayashi, 2008; Bennett & Barth, 1973; Bruckner, Subbaraman & Catalano, 2011; Johnson & Nye, 2011; Wong & Yung, 2005).

Superstitious beliefs also manifest themselves in various numbers. In some cultures, it is widely believed that numbers may affect the fate of a person. In China, "4" is associated with death and people with superstitious beliefs try to avoid this number at any cost. Much of the relevant literature concerning the importance of numerological superstitions in real estate markets examines the effects of Chinese numerology

on prices (Bourassa & Peng, 1999; Fortin, Hill & Huang, 2014; Shum, Sun & Ye, 2014).

In Western society, such numerological superstitions also exist. The most famous example is the Friday, the 13th. The "bad luck" effect of Friday the 13th manifests itself in social, financial and economic decisions. For example, Kramer and Block (2008) report that individuals become more risk-averse on this day. Palazzolo (2005) shows that on Friday the 13th, many business and economic decisions are delayed. On the other hand, studies, devoted to the investigation of Friday the 13th effect on stock markets (Auer & Rottmann, 2014) or precious metals markets (Auer, 2015), report no permanent numerological seasonality. On the other hand, the seasonal Halloween effect is present in markets for agricultural commodities (Arendas, 2017; Burakov & Freidin, 2018).

Common superstitions in Russia are close to those widespread in western countries, rather than to Asian beliefs: number 7 is considered to be lucky, whereas number 13 is thought to be unlucky (Block & Kramer, 2009). One of the clearest manifestations of these effects may be found on the residential real estate market. In most cases, buyers of apartments in Russia do not want to deal with the unlucky 13th floor due to numerological superstition on the one hand and potential problems with the re-sale in the future on the other. This causes delays and low sales for the developers. Antipov and Pokryshevskaya (2015) found the "unlucky floor" effect in Saint-Petersburg primary real estate market. In some western countries the common practice in construction is to omit the 13th floor of the building, but in Russia such a practice is scarce. The only way to fight irrational beliefs, found by a few local developers, is to set discounts for the 13th floor. This gives us an opportunity not only to retest

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the “lucky and unlucky floor” effect as a manifestation of numerological superstitions on the real estate market, using new actual sales data for Moscow (including New Moscow district), but also to test how the bad and good luck effect would response to discounts for apartments on the 13th floor.

We thus ask whether superstition effects could be mitigated with developers’ discount policy. We have found no research investigating the role of discounts in mitigating the superstitious effects, nor studies of such superstitious behavior based on Russian data other than that by Antipov and Pokryshevskaya (2015).

Following the methodology of Antipov and Pokryshevskaya (2015), I analyze actual apartment buyers’ preferences for different floors in buildings of the sample in Moscow primary market for apartments. The sample includes 40 buildings in Moscow and New Moscow district. The first control group includes 30 buildings and 4254 apartments on the floors 6–8 and 12–14 in total. The second, “discount” group includes ten buildings under construction with 1608 apartments on the same floors in total. For these buildings a 10% discount is present for all the apartments on the 13th floor. The sample includes the buildings under construction developed by “PIK Group”, “Urban Group”, “Lider Invest”, “Vedomstvo Kapital” and “Obltorg Universal”. For the control group, given the identity of plans and prices of neighboring floors, I manage to isolate effects of the numbers 7 and 13 from other features that may affect buyer’s decisions (window view, price, etc.): 13th floor in compared to 12th and 14th floors, while 7th floor is compared to floors 6 and 8. The discount group includes ten buildings with identical floor plans and window views. The effect of the 13th and 7th floors are also isolated, given identity of floor plans. All the buildings in the discount group are developed by the same developer.

Due to massive residential real estate development in Moscow (including New Moscow), we have collected data on sufficient number of apartment houses under construction and may estimate effects of sales on different floors.

In contrast to the study by Antipov & Pokryshevskaya (2015), we estimate the “unlucky floor” effect on actual Moscow data, rather than Saint-Petersburg. Also, given that some developers in Moscow try to overcome superstitious 13th floor effect by discounts for apartments at the 13th floor, we analyze two groups of apartments with identical plans. Data in the first (control) group are used to test if the “lucky” and “unlucky floor” effect is present in the Moscow primary real estate market. Data in the second (discount) group are used to investigate whether a 10% discount for the 13th floor apartments is enough to mitigate the superstitious belief.

The remainder of the paper is organized as follows: in section 2 we describe the dataset, methods and assumptions; section 3 presents results of the statistical analysis; section 4 concludes and outlines areas of further research.

2 Materials and methods

The data for testing the above stated hypotheses of the study was collected in June, 2018, includes 240 observations and contains data on the share of apartments sold on floors 6-8 and 12-14 (30 buildings) and data on the share of apartments sold on floors 6-8 and 12-14 (10 buildings) with 10% discount for the 13th floor apartments for all residential buildings under construction in Moscow (including New Moscow district), Russia that meet the requirements similar to that of Antipov & Pokryshevskaya (2015). The requirements include the following:

1. All buildings have no fewer than 15 floors. If a building has 14 floors, then for many people the 14th floor would be preferable, because there are no neighbors upstairs.

2. The price of an apartment is independent of the floor on which it is located. This is typical of apartments sold on the primary residential real estate market in Russia by the construction company. Initial prices are not typically negotiated (for control group only).

3. Plans of floors 6–8 and 12–14 are identical so that floors 6 and 8 can be used as counterfactuals for floor 7, while floors 12 and 14 can be used for floor 13.

5. There are no fewer than 10 apartments on each floor (the aggregate number of apartments across all sections of the building).

6. The percentage share of sold apartments on floors 6–8 or floors 12–14 is larger than 0.

7. The houses are under construction and will be finished within 1–2 years from the date of data collection. If apartments in a building would be in a market for a long time, eventually they would be sold and the share of sold apartments would become 100% for all floors. Therefore, the differences between the floors are likely to be negligible if residential real estate objects, sales of which started long ago prevail in the sample.

Criteria 1–4 ensure exogeneity of the floor number. That is very important as we need to isolate the floor effect on demand for apartments. Criteria 5–7 help us to avoid problems with representativeness and sufficiency of the data.

In this study we test the following hypotheses.

The first hypothesis states that there exists a preference for apartments on the 7th floor due to the “good luck” effect, compared to the 6th and 8th floors (for both groups of the sample, with and without discounts).

The second hypothesis states that due to the “bad luck” effect, the share of sold apartments on the 13th floor should be less than on the neighboring 12th and 14th floors (control group).

The third hypothesis states that in case of a discount implementation, the share of sold apartments on the 13th floor should not be less than on the neighboring 12th and 14th floors.

TABLE 1: Mean percentage shares of sold apartments.

Floor	Control group		Discount group		
	Mean, %	s.d. %	Floor	Mean, %	s.d. %
6	69.02	29.04			
7	66.37	30.75			
8	63.21	32.77			
12	47.36	13.93	12	41.28	14.06
13	29.76	17.62	13	41.80	26.64
14	43.42	22.39	14	35.57	19.92

3 Results

Mean percentage shares of sold apartments for the control and discount group are presented in Table 1. In the control group among the sampled floors, the lowest sales are for the 13th floor (29.76%) and the highest is for the 7th floor (66.37%). It appears that both “lucky” and “unlucky floor” effects are present in our control sample. In the discount group, where apartments on the 13th floor are sold with 10% discount, the sales of the 13th floor apartments are no less than those on the neighboring floors.

Because the buildings in the sample have different total numbers of apartments, the measures of the luck effects may be more accurate in some buildings than others. So we treated the building as a random effect in a meta-analysis, the discount as a fixed effect, and used the raw percent difference (e.g., percent sold in 12 and 14 minus percent sold in 13) as the measure of the effect in each building. In order to take into account the variations in sample size across the buildings, we used two random-effects meta-analysis with building as the unit of analysis, using the metafor package of R (Viechtbauer, 2010).

To test the 7th floor “good luck” hypothesis we reframe the initial sample, consisting of 30 buildings in the control group and 10 buildings in the discount group and test the 7th floor effect on the sample of all the 40 buildings, that is the sample for the hypothesis testing includes observations on all the sold apartments on the 7th floor. Table 1 summarizes the results. Here, the reported p-value is two-tailed and the confidence interval is 90%. Thus, the 7th floor “good luck” effect would be barely present by a one-tailed test in the total sample of buildings.

Result of the second and third hypotheses are presented in Table 3. The results of the mixed-effect model show that the 13th floor “bad luck” effect is statistically significant for the sample in the control group (p-value being <0.0001), replicating the previous results of Antipov & Pokryshevskaya (2015). Taking into account the discount effect, the implementation of the 10% discount by the developer helps boosting the sales (p-value being <0.0001) and may (as one

TABLE 2: The results of the random-effect model estimation for the 7th floor effect. (P-value is two-tailed.)

Estimate	S.E.	Z-value	p-value	CI (l.b.)	CI (u.b.)
0.016	0.010	1.657	0.097	0.000	0.032

TABLE 3: The results of the random-effect model estimation for the 13th floor effect.

	Estimate	S.E.	Z-val.	p-val.	CI (l.b.)	CI (u.b.)
Intercept	-0.149	0.021	-7.120	.000	-0.184	-0.115
Discount effect	0.153	0.038	3.995	.000	0.090	0.216

of explanations) help in mitigating numerological superstitions.

3.1 Conclusion

Superstitions play an important role in everyday decision making, as well as in business relationships. Contemporary studies provide limited empirical evidence on the effect of irrational superstitions on consumer decision making and their resilience to rational countermeasures like discounts. Most studies are concentrated on Asian superstitions. The present study addresses the issue of lucky (“7”) and unlucky (“13”) numbers and their impact on consumer behavior in the Moscow primary real estate market, and the resilience of this impact to developer’s discount programs.

Following methodology of Antipov and Pokryshevskaya (2015), the present paper examines actual consumer behavior in natural market conditions. Despite the fact that the data are non-experimental, the explanatory factor, the floor number, is exogenous since floors 12, 13 and 14 are almost indistinguishable objectively.

Based on the dataset from the Moscow primary real estate market, in control group (no discount), there was a negative effect of the 13th floor on demand for apartments in buildings of the sample. An increased demand for the lucky 7th floor for all the buildings in the sample is also present, but weakly. These results indicate the importance of numerological superstitions in buyers’ behavior concerning residential real estate choices and decisions.

Yet, developers undertake various measures to boost the sales. Taking into account bad sales data for the 13th floor has led some developers in Moscow to introduce discounts for apartments on the 13th floor. Results show that a 10% discount may mitigate the impact of numerological superstitions on a moderate level and help to boost the sales of “unlucky” apartments.

4 References

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