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Price Discrimination in Real Estate Market in Russia

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Alexey Aristov

Research Advisor:

Maxim A. Storchevoy, Senior Lecturer

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

Автор	Аристов Алексей Ростиславович
Название ВКР	Ценовая дискриминация на рынках первичного жилья в России
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Научный руководитель	Сторчевой Максим Анатольевич
Описание цели, задач и основных результатов	Целью исследования является описание возможностей увеличения менеджерами рентабельности продажи недвижимости путём исследования факторов, на основании которых возможна ценовая дискриминация. Задачи исследования – определить возможность ценовой дискриминации на первичных рынках недвижимости и определение характеристик покупателей, на основании которых возможна ценовая дискриминация. Основные результаты исследования – выявлена отрицательная разница между уплаченной ценой и резервной ценой за квартиру; выявлена зависимость между возрастом и занятостью покупателя и их резервной ценой.
Ключевые слова	Ценовая дискриминация, рынок недвижимости, резервные цены

ABSTRACT

Master Student's Name	Aristov Alexey Rostislavovich
Master Thesis Title	Price Discrimination in Real Estate Market in Russia
Main field of study	Management
Year	2017
Academic Advisor's Name	Storchevoy Maxim Anatolyevich
Description of the goal, tasks and main results	The goal is to describe how exactly real estate businesses can increase their margins by examining the factors on the basis of which they can perform price discrimination. The tasks were to identify the possibility of price discrimination in real estate markets and identify ways of the price discrimination can be made. The study has produced two major findings: there is a significant negative difference between the actual price paid for an apartment and the reservation price; There is a significant correlation between the customer occupation, their age and the reservation price for their apartment.
Keywords	Price discrimination, real estate, reservation price

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INTRODUCTION

The **aim** of the following study is to describe how exactly real estate businesses can increase their margins by examining the factors on the basis of which they can perform price discrimination. Whereas it is possible to employ price discriminations of different degrees, the factors which are relatively easy to use are related to the third-degree price discrimination (in the Pigou's price discrimination taxonomy), since it allows managers to sort the customers in accordance with their characteristics. This sorting further allows charging different prices to each customer in order to extract more consumer surplus from each customer by charging an accordingly higher price, and thus increase the business's profit margins.

Consequently, the above mentioned aim can be subdivided in the following **objectives**:

1. Identify the possibility of conducting price discrimination for a real estate company
2. If the possibility is identified, identify ways on how price discrimination based on visible characteristics can be used by real estate managers.

Real estate business is characterized by not-so-high margins, which is especially is true for apartment housing. Therefore, it is **important** for developers and real estate agencies to find an appropriate price for apartments, which will reflect both the actual value of the housing and the perceived value for the buyer. Whereas the value of a real estate object can be calculated basing on, for example, cost-based method (i.e., the price is set in accordance with construction and other costs and adding a margin), the value of an apartment for the buyer is inscribed in the reservation (or subjective) price, which indicated the maximum price a particular customer is ready to pay for a product.

What is more, apartment housing is the most popular type of housing in Russia, which is predefined due to historical reasons (vast building of apartment houses were made during USSR time) as well as geographical and socioeconomical ones (harsh climate conditions coupled with mediocre per capita disposable income). This underlines the importance of investigating the phenomena of price discrimination applied to this particular type of dwelling. Besides, in the following research only the primary real estate market is investigated, due to the availability of data and limited scope of research (master thesis).

Above all, the assumption is made that the results of this research could be possibly applicable not only to Saint-Petersburg market of apartment housing, from which data is used, but also to most of the Russian cities due to similar economic and dwelling conditions.

Additionally, it is admitted by several academicians (Black et al. 2003), that currently major research of real estate is currently aimed at the interconnection of finance and real estate, as the latter is a lucrative investment instrument. However, the influence of behavioral economics domain is drastically overlooked in the current paradigm of real estate research, yet this domain is the cornerstone of many processes and resulting decisions in the real estate industry. Thus, this underlines the importance of investigating price discrimination, which surely has a connection to behavioral economics.

Thus said, the reservation price can only be known (to a certain extent) to the buyer and this reservation price is different not just for particular groups of customers, but also for every unique customer. Consequently, it is speculated that there must be a range of factors which influence the reservation price of every customer.

Real estate business can be divided into various lines of business (residential, production, office, etc.), which eventually mean that there are different groups of customers in every separate line of real estate business. These businesses are divided into even more subgroups. As for the residential housing, one of the most frequently used ways of market segmentation is segmentation based on target customer group income, for instance: luxury, standard and low-cost.

In the low-cost apartment housing segment of residential housing, in which the OJSC "Normann" operates, customers are, as it may be expected, are very reluctant to pay more for apartments both because they can not afford it and because of their economizing mindset. Therefore, in order for real estate businesses to maximize their profits, it is especially **important** to understand which particular factors influence the reservation prices of this segment's customers.

At this point it is necessary to understand how exactly **housing industry managers** can leverage their knowledge of reservation prices of their different groups of customers. The special importance of this issue is highlighted by the fact that the margins of block of flats housing business are usually lower, because of lower purchasing power of the customers in this segment, while construction costs are relatively similar to higher segment of apartments[1]. Moreover, low margins in low-cost real estate segment due to traditionally higher price competition in this market.

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[1] OJSC "Normann" (construction company) typical project calculations

Assuming that price factor is one of the leading factors in the process of forming an initial consideration set for apartment housing estate customers, the further decision process should be based on a broader range of factors which influence (to a different extent) on the customer's final decision. Hence, the business is able to adjust the price of a residential object basing on the knowledge of factors which influence the reservation price for every particular customer, which is called price discrimination.

Price discrimination is defined by Arthur Cecil Pigou as is a pricing strategy that charges customers different prices for the same product or service (Pigou,1920). Price discrimination is possible because of the market imperfections, including asymmetric information, the possibility of conditions for establishing monopolistic or oligopolistic markets. The process of price discrimination includes three "degrees" of price discrimination: perfect price discrimination (first-degree discrimination), where every customer is charged a different price; price discrimination based on the volume of product bought (second-degree discrimination) and price discrimination based on income of different groups of customers (third-degree discrimination).

Managers of real estate businesses can use both first and third-degree price discriminations. It is explained by the fact that they are aware of the fact that their customers belong to a particular income group (as defined by their real estate objects' target customer group). Moreover, if the above mentioned assumption about price adjustment holds true, managers can charge individual price for every individual customer, which means using first-degree discrimination.

This possibility allows extracting additional profit from customers by aiming at their individual reservation prices. The closer the proposed price to the reservation price, the lower will be the consumer surplus, and the higher will be the producer surplus (real estate business). Yet, in order to do that, the real estate managers must know the factors which actually influence the individual reservation price of particular groups for customer, at which current study is aimed – discovering the possibilities of price discrimination in Russian primary real estate market based on characteristics of a customer, which could be obtained by those managers.

1. THEORETICAL BACKGROUNDS FOR PRICE DISCRIMINATION

First and foremost, it is necessary to outline the sources from which the information about the theoretical backgrounds was accumulated and analyzed for this particular study.

The literature search included search in the following databases: EBSCO, Emerald Journals, Scopus, Francis & Taylor, Google Scholar and others.

The following theoretical research is based on the literature found in open sources. For facilitating the search of information, the following databases were used to search for the literature: EBSCO, Scopus, Google Scholar and others. The results of the queries put into these databases' search engines redirected to numerous publishers, of which notable are Francis & Taylor, Emerald Journals, Springer, etc. The resulting literature review incorporates articles from many well-established academic journals, such as: Journal of Marketing Research, The Journal of Real Estate Finance and Economics, The Journal of Political Economy, et cetera.

For each part of this study a corresponding array of queries was input into the database search systems, so that the necessary studies could be found. In order to ensure that no articles were overlooked in the course of the composition of the literature review due to the misuse of the established terminology, a number of consultations were held with the Research Advisor to identify the correct words and commonly adopted terminology for queries for each of the parts of the study. Moreover, in order to facilitate the filtering of the search results, various search engine operands were used. For instance, to eliminate from the search the well-studied issue of racial discrimination in real estate, the search query was put in the following way: "price discrimination in real estate market –racial".

For the discussion of the definition of price discrimination, its contemporary practices in various industries, including real estate, and existing taxonomies, the next queries were used: "price discrimination definitions", "price discrimination practices", "price discrimination taxonomy", "price discrimination in industries", "price discrimination cases", "price discrimination in real estate", "price discrimination in housing markets", et cetera.

Furthermore, in order to obtain information on real cases of price discriminations in the countries out of the scope of this research (outside Russia), several websites of constructing companies in a range of countries (New Zealand, Australia, Canada, USA, China, Taiwan, Hong Kong) were explored in order to identify the cases of price discrimination.

For the discussion of existing pricing strategies and their applicability in real estate markets the following queries were used: "pricing in real estate", "pricing in housing markets",

"pricing strategies", "pricing strategies taxonomy", "discussion of pricing strategies", "overview of pricing strategies", et cetera.

Next, in order to explore and discuss the phenomena of reservation price in real estate markets, the following queries were entered: "reservation price in real estate", "reservation price in housing markets". The search did not yield significant results, thus a consultation with Research Advisor was held. After that, the query was altered in the following way: "willingness-to-pay and reservation price", "willingness-to-pay in real estate", "willingness-to-pay measurement", etc.

Finally, in order to obtain a taxonomy or framework for discussing the customer characteristics in real estate markets, the following keywords were used: "customer characteristics", "observable customer characteristics", "customer attributes", "grouping factors for customers", "customer characteristics in real estate", "customer taxonomy approaches", "customer structure in real estate", "customer characteristics in housing markets", etc.

As it will be revealed further, a large chunk of the literature review consists of classical and fundamental works on economics, to which the domain of price discrimination belongs to, from the later part of the previous century. Nevertheless, since a part of this current study deals with several marketing domains, the literature review also incorporates more modern works from the 21st century. However, according to the fact that almost no works immediately deal with price discrimination in real estate markets (neither fundamental nor contemporary), it is possible to conclude that this research stream is currently under-developed, which adds to the novelty of the current master thesis research.

Definition and taxonomy of price discrimination

Price discrimination is defined by Arthur Cecil Pigou as "a pricing strategy that charges customers different prices for the same product or service" (Pigou,1920). Price discrimination is possible because of the market imperfections, including asymmetric information, the possibility of conditions for establishing monopolistic or oligopolistic markets.

An exhaustive and exclusive definition of price discrimination, according to the discussion by Phlips (Phlips, 1983), should also cover all possible cases of price discrimination, including those that have appeared recently and will appear in future. Moreover, the definition must also clearly distinguish the actual price discrimination from those instances which resemble price discrimination but, when analyzed, are actually not. The definition should also provide for the cases when different products are sold under discriminating prices, which contradicts with

Pigou's definition. Moreover, the same product can be sold to different customers at different price levels, which would reflect the actual cost of selling the good (for instance, transportation costs). The situation could also happen vice versa: all the customers are charged the same price for transportation, despite actual cost variance (Varian, 1989).

Therefore, one of the definitions which would augment the original definition by Pigou is provided by Stigler (Stigler, 1987): "Price discrimination is present when two or more similar goods are sold at prices that are in different ratios to marginal costs". Despite the fact that the above mentioned definition vaguely pictures the nature of the goods by using the word "similar goods", it clearly demonstrates the nature of price discrimination from the company's point of view.

There is a range of the prerequisites which required being intact in order for a firm to successfully perform price discrimination. Those are: the company has significant market power, the company can distinguish its customers into non-overlapping groups and the company must be able to restrict resale (Pigou, 1920).

Since firms have significant market power only in monopolistic and oligopolistic markets, those are the most common conditions for price discrimination. Market power in its very broad definition is described as "the conditions, where the providers of a service can consistently charge prices above those that would be established by a competitive market" (Alvarado, 1998). Hence, in competitive markets charging a price over those established by market is unlikely to lead to price discrimination.

At this point it is necessary to point out that the market under consideration in this study – real estate market – fits the classic definition of an oligopolistic market: low number of producers, high entry barriers, and limited information circulation.

Moreover, the market power is required to sort customers, so that the company is able to offer different prices to different customers, thus excluding possibility that customers will be able to resale the product to other segments of customers, conducting the arbitrage, which may significantly limit the company's availability to perform price discrimination.

Taxonomy

In his work "The Economics of Welfare", Pigou first introduces three types of price discrimination, counted as "degrees" (Pigou, 1920). Those three "degrees" of price discrimination include:

- Perfect price discrimination (first-degree discrimination), where every customer is charged a different price;
- Price discrimination based on the volume of product bought (second-degree discrimination);
- Price discrimination based on income of different groups of customers (third-degree discrimination).

However, in this research this framework is adjusted in accordance with the one proposed by Russian management scientists (Storchevoy et al. 2016) in order to either be more suitable for application in real estate markets, as well as for the sake of simplicity and clearness.

It is assumed that the 3 types of discrimination initially proposed by Pigou can be rearranged into two general groups: price discrimination on the basis of visible characteristics and self-selection price discrimination (see Figure 1). By default, it is assumed that the seller which conducts price discrimination is a monopolist or has ample market power to behave so; yet, theoretically, price discrimination is also possible in competitive conditions (Stole, 2007).

Further, it can be determined how exactly price discrimination of these two types can be implemented in real estate market, particularly in block of flats apartment housing.
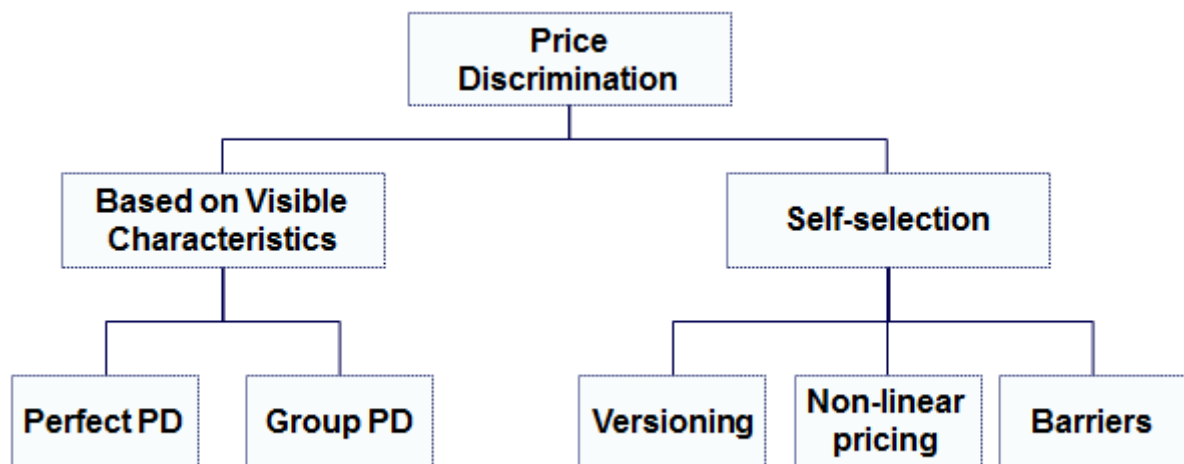

Figure 1. The proposed taxonomy of price discrimination.

The first type (price discrimination based on visible characteristics) implies that a company can distinguish its consumers in accordance with particular characteristic and therefore charge individual prices for customers possessing this characteristic.

The second type (self-selection) bears the idea that customers are offered a range of products which differ to a certain extent, but at the same time this difference does not incur any significant difference in manufacturing costs. Exemplified, an iPhone 16Gb and iPhone 64Gb do not differ significantly from the point of view of manufacturing costs, but differ a lot in price (in fact, no more than $12), which enables Apple to take out more consumer surplus from consumers with higher reservation prices[2].

As for the *discrimination on the basis of visible characteristics*, it is first assumed that the consumers are not able to resell the product, since this would allow a consumer with higher reservation price buy an apartment from consumers which are offered lower prices. Two general methods of discrimination are possible here: **perfect** price discrimination and **group** price discrimination.

Speaking about **perfect** price discrimination, it means that the business is able to extract the whole consumer surplus by establishing an accurate selling price, which is the same as the consumer's reservation price. This price discrimination is applicable in the case of single purchase (a single unit of good), as well as in the case when consumers buy different amount of goods (e.g., transportation services, communication services): in this case consumer surplus can be extracted only through *block pricing,* when a consumer is offered an individual block of product, which consists of an individually tuned number of good.

Real estate business both sell single units of apartments as well as several units to a single customer at a time. Yet, the latter could very well be the case for real estate speculators. Therefore, perfect price discrimination in real estate market (as well as in most markets) in its pure sense is hardly possible – in order to do that a business must know demand functions of every individual client, as well as have the possibility to charge every customer significantly different prices without further possibility of reselling. Therefore, businesses only partially implement the strategy of perfect price discrimination: they charge every customer different price, which does not allow extract the whole consumer surplus, yet which is situated in the limits of reservation price boundaries.

From the technical standpoint, it is possible to indicate two stumbling blocks for real estate business which must be overcome in order to allow for near-perfect price discrimination: 1) Establishment of the communication with potential client before the assignment of final selling price of an apartment; 2) Ability to accurately define the reservation price of a client by

[2] Here's how much money Apple makes when you buy a 64GB iPhone instead of a 16GB model / Business Insider. – Mode of access: http://www.businessinsider.com/apple-makes-much-more-money-off-the-64gb-iphone-2016-3

the means of negotiation techniques. However, the discussion of the success of such techniques is mainly out of the scope of the following research.

Group price discrimination appears to be a more practical way of extracting additional consumer surplus on the basis of a particular visible characteristic. At the same time, this approach implies that every individual customer still has its own demand function and, as a consequence, own individual reservation price. However, in this case a business does not strive to discover individual price, but tries to find *upper limits* of reservation prices in customers grouped by a particular characteristic and charges such a price, at which it will extract the largest profits from this particular group.

As for the specific characteristics, in accordance with which it is possible to segment customers into groups, these can be the following: age, gender, occupation, etc. At the same time, one important remark is that in the case of real estate business, a customer may be not an *individual,* but a whole *family,* since usually such a significant investment decision as buying an apartment is made collectively. Yet there might be various cases of the decision making process in families, for example, when a particular family of student customers (which usually have lower disposable income compared to more aged groups of customers) decide to purchase an apartment, whereas financed by their more well-off parents.

In this regard, *family per capita income* could be used as a distinguishing factor for grouping customers. However, two problems concerned with the implementation of this notion can be identified. First, family per capita income might not correlate with their reservation price. Second, it might be problematic to obtain adequate data about per capita income of a family for real estate managers. What is more, even if it is theorized that official data about per capita income are available, those might not reflect the actual wealth of a family, due to the existence of incomes which may not be included in the official documents proving the incomes of a family. Moreover, the latter is a frequent case in Russian economy, since more than 30% of families claim that they do not include their income sources in official reports.[3]

Nevertheless, it is possible to identify other characteristics of a whole family as a real estate customer which can be used to segment the customers into groups. One of these is the *current living conditions* of a family, which is defined as current number of square meters per family member. It is supposed that this factor combined with objective information about a

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[3]Наблюдения чиновника: Как бороться с зарплатами в конверте // Ведомости
. – Mode of access: https://www.vedomosti.ru/management/blogs/2015/09/24/610023-zarplatami-v-konverte

family's per capita income will provide sufficient information about reservation prices of this family as a customer.

Furthermore, current *domicile* can also be an indicator of a particular level of a reservation price. For instance, consumers from medium-income cities (Tver, Perm) are anticipated, on average, to have lower reservation prices than those from the capital (Moscow) or high-income regions of Russia (Khanty-Mansiyskiy Autonomous Region).

Thus, it is possible to claim that some of the three above-mentioned characteristics (family income per capita, current living conditions, current domicile) might be used to segment customers into groups to conduct group price discrimination. Further choice of the factors can be considered on the basis of empirical data available.

At the same time, it is necessary to mention that some companies do use group discrimination techniques such as: discounts for non-local domicile residents, discounts for second purchase from the particular company, etc. Some companies also use discounts for students and this real estate company's employees. However, it is arguable whether the second-purchase discount is beneficial for companies: it is unlikely that a single customer will buy more than one apartment at once. It is argued that those who do that are speculators, who possess way more money than ordinary customers, thus, the second-purchase discount may turn out to be not leading to extracting more consumer surplus.

Overall, it can be argued that obtaining information about their customers is quite a time- and resource-consuming venture for an ordinary real estate company, which usually does not have access to any exclusive information sources, such as governmental databases. Yet, at the current point it is necessary to underline that usually apartments are considered high-bid products, which means that apartments are a considerable investment for the majority of customers. On the one hand, it means that resource investments made during the process of collection of information considering the above mentioned three points on every customer will eventually bring returns even despite these high transaction costs of information search. However, on the other hand, the customers may *imitate* the necessary characteristics in order to gain discounts and retain more consumer surplus, which indicates the need of even more investments in the search for adequate information on the customers. This issue is also out of the scope of this paper.

The second type of price discrimination – *self-selection discrimination* – can potentially be used when a business can not identify characteristics to segment its customers or can not

conduct discrimination due to various reasons. In these cases, a company can propose its customers to divide into groups themselves by offering them a range of purchase options. Thus, customers with higher reservation price will prefer more expensive purchase options, whereas others will opt for cheaper ones.

The first type of self-selection price discrimination is **versioning**. Producer offers a range of products versions, which do not differ from the point of view of costs, but have different characteristics. Originally, in real estate market housing can be divided into premium class housing, standard class, etc. However, versioning can be done in selling apartments even in the same house in the ways described further.

Essential versioning can be done between apartments situated in the first and the last floor of the building, since apartments on these floors are usually sold at a lower price. Further, versioning can also be done on the basis of apartment situation on the same floor: the number of windows and the direction of windows. As a rule, apartments with picturesque view are sold at a premium. More essential versioning is done by selling apartments with different layouts, even deliberately changing it in order to attract customers with lower reservation prices.

However, the latter measure can be questioned from the point of view of business ethics, as well as market competitiveness, given that other companies may not be able to resort to such a measure.

Next, a real estate company can sell apartments with or without decoration. By versioning the apartments in such a way, a business can at the same time sell apartments to consumers with higher reservation prices, who are ready to pay for the ready-made apartments, at the same time selling real estate objects to customers with lower reservation prices, who wish to make cheaper decoration themselves. This may enable a company to extract more consumer surplus from the first group of consumers.

The strategy of **non-linear pricing** implies that a customer is charged different prices for different number of good units. Non-linear pricing can be implemented in two-part tariff strategy, which means that a customer is first charged for an "entry ticket" to the market and then charged different price for every consecutive unit of product (which is considerably lower than the "entry ticket"). In real estate business this is used in such a way that the price for every square meter is different for apartments of different size. Hence, customers pay an "entry ticket" and then are charged differently: the smaller the apartment bought, the higher is the price per square meter.

Another type of non-linear pricing is offering a discount for the consecutive purchase of apartments, meaning that if a customer buys two apartments from the same company, she is given a discount for the second one. However, as is it has already been discussed above, this strategy may turn out to be erroneous due to the presence of real estate speculators.

Furthermore, several sorts of **barriers** can be used to give the customers an opportunity for self-selective discrimination. In essence, it means that customers are provided with an option of performing a particular action in exchange for lower price. Usually this action requires considerable effort from a consumer, for instance, collecting promotion coupons, going to a remote place or waiting in a long line. The rationale behind this is that more affluent customers will not spend their time and effort and will just buy a product without any discount, whereas less affluent buyers would prefer to spend their efforts to obtain the discount.

In real estate business companies can either require customers to do symbolic actions (collecting promotion coupons) or actions which will promote the company's business, as social network reposts.

Another selling condition which can be used to allow for self-discrimination among consumers is **payment time**. Overall, there could potentially be 3 general time frames when a buyer of real estate can carry out their payment: 1) preconstruction development (when a company charges their customer for a real estate object which is still under construction), 2) payment for ready apartment, 3) mortgage lending.

It can be assumed that customers with different reservation prices will buy apartments in different time frames, allowing a real estate business to leverage this opportunity to charge different prices for those groups of customers in order to increase profits. At this point, it can be hypothesized that customer who make their payments during #1 and #3 time frames tend to have lower reservation prices, since they either have to wait for the construction to complete or borrow money, as they do not have the required sum of money (Bayer, 2010).

Several authors argued on the question of whether a producer can initially charge a higher price for his product in order to sell it to customers with higher reservation price and make a discount after to sell this product to consumer with lower reservation price. Ronald Coase claimed that buyers behave rationally, which implies that they will wait for the discount, thus being reluctant to buy the product in advance, which restricts intertemporal price discrimination (Coase, 2013). However, later academicians found a number of solutions which enable the

company to overcome this unavailability to apply intertemporal discrimination (Stokey, 1979, Landsberger, Meilijson, 1985, Bagnoli et al., Fehr and Kuhn, 1995, Dudey, 1996, Barak, 2004).

Nevertheless, there is almost no literature which deals with price discrimination in real estate markets, not to mention specifically Russian or Saint-Petersburg market. In this regard, it is possible to conclude that the existence of this gap is explainable taking into account the limited amount of works on price discrimination in **most** of the industries.

Contemporary discussion of price discrimination in various industries

The evidence of price discrimination in industries

Despite the fact that the concept of price discrimination was introduced almost a century ago, the application of this concept to a range of different markets has not been investigated yet. There are a number of works which deals with the general conditions of the efficiency of price discrimination (Anderson, Dana, 2009), which can theoretically be applicable to most of the industries, yet they do not provide any investigation of real application of the price discrimination.

As for empirical evidence of the application of price discrimination is vast, however, few works discuss the particular methods of price discrimination and their comparison in various industries or give their own taxonomy of price discrimination methods, applicable to a particular industry.

At the same time, other works on price discrimination (Montgomery, 1997; Chintagunta, 2003) discuss the positive effect of this pricing strategy: price discrimination is to increase profits in range 4-16%. More narrow research (Khan, Jain, 2005) shows that application of price discrimination techniques in retail improves profits up to 26%. Furthermore, pop-music concert tickets research (Courty, Pagliero, 2012) reveal that price discrimination increase profits in this industry 5-7%. From the point of view of real estate business, even a relatively "modest" increase in profits of 5% would mean millions of rubles, which constitute a significant amount in absolute values. This point reinforces the importance of further investigation of the issue of price discrimination.

The evidence of price discrimination in real estate markets worldwide

A research by H. Sun and S.Ong indicates that apartments in the same building can be sold at prices, which difference varies in the range of 20%, which is considered a significant markup/discount (Sun, Ong, 2013) for such a low-margin industry. Apartments which were

considered in this research were assumed to be close substitutes to each other. The researchers further build a model which connects initial price signals (interpreted as price of previous transactions in the same building) and further customers' willingness to pay. In the light of the following research, this means that the existing dispersion in homogeneous good (same apartments in the same building) and successful transactions in the above mentioned price range are explained by significantly different reservation prices in the same income category of consumers. Moreover, it can also indicate the evidence of extracting more or less consumer surplus from more-or-less similar customers.

The impact of the possibility of retaining more consumer surplus on the eagerness of buying a real estate project is touched upon in the work by Miller and Sklarz: positive correlation between higher selling price premium and time during which an object is sold is demonstrated (Miller, Sklarz, 1987). Under the scope of this research it can be interpreted in the following way: customers of real estate business do in fact assign reservation prices to their prospective purchases (apartments), which results in similar objects with higher price premium selling longer due to the reluctance of buyers caused by selling price being higher than the majority of the reservation prices of customers in this segment, given that the customers are normally distributed.

As it has already been mentioned, few articles deal with empirical evidence of price discrimination on real estate market. What is more, no significant research on the influence of personal characteristics of a customer on its reservation price have been detected. It is possible to identify two global branches of reasons which resulted in the possibility of making such a statement.

The first group of reasons refers to the concept of personal characteristics itself. It is likely that this group of factors contributes nothing to reservation prices. Thus, it means that reservation prices are formed solely on the basis of hedonic characteristics of a real estate object (floor space, proximity to public amenities, etc.). This hypothesis could be proven by discovering that there are no significant correlation between any personal characteristic of a customer and her proposed reservation price.

The second group of reasons refers to the research design. Supposedly, it is impossible to statistically distinguish hedonic factors from personal factors because of mediation and moderation of variables. Moreover, it can be argued that the concurrent researches do not publish the results of their findings in case if they are not showing any correlation due to imperfect research design, which may include nonresponse bias (people are reluctant to communicate their

reservation prices or deliberately distort the information), sampling error or measurement error (imperfect questionnaire design, et cetera).

However, the existing examples prove the possibility of price discrimination, mostly based on self-selection, in primary markets, which takes different forms, including those described in this paper:

a. Perfect/Group price discrimination

As it has already been mentioned, in order for a company to conduct perfect price discrimination it must know the demand functions of every buyer of their property. It is assumed that additional information about a potential buyer might give insights about the range of the reservation price of a customer. For instance, an Australian developing company Sullivans[4] does not offer any listings in their current project of block of flats (Eight Avenue Maylands) until user goes through the registration process, providing data about his interest and phone number. After that the customer is contacted by a company's salesperson. The website claims that "there's an offer lot, but only for a selected few". Therefore, these factors supposedly allow the company to charge different customers with different prices on the basis of the information provided.

Moreover, a New Zealand Trade Me Property[5] while listing available apartments instead of offering a solid price for an object indicates "auction" or "negotiated" price, which is also employed to detect customers with higher reservation prices.

b. Versioning

A lot of evidence proves the ability to create different versions of the same apartment which do not reflect actual marginal costs of creating a version of this product.

For example, a Canadian developer McGill Real Estate[6] provides a list of prices for the number of apartments of different size situated on different floors. It can be observed that in general the price goes up with higher floor for the apartments of the same size, which is an evidence of versioning strategy employed by this company[7]. Yet, it can be argued that these price differences can be explained by various floor plans on every floor, which, on the other hand, may not be true.

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[4]"Apartments Maylands Home" 2017 / Sullivans. - Mode of access: http://www.sullivansmaylands.com.au/

[5] New Zealand Real Estate. Rentals, Houses For Sale & More 2017 / Trade Me Property. – Mode of access: www.trademe.co.nz/property

[6] Condos Castelnau Phase 4 Villeray Condo / Mcgill Real Estate2017. – Mode of access: http://www.mcgillimmobilier.com/en/condos-castelnau-phase-4-villeray-condo/

[7] Columns denote the types of apartments on every floor, whereas rows denote floors (*etage)* on which these apartments are situated. For apartment types from 3 to 10 the price increases with the increase of floor number.

	01 2CC 775 p.c.	02 1CC 435 p.c.	03 1CC 445 p.c.	04 2CC 840 p.c.	05 1+den 700 p.c.	06 2CC 860 p.c.	07 1+den 660 p.c.	08 1+den 660 p.c.	09 2+den 860 p.c.	10 1+den 580 p.c.
3ième étage	VENDU 301	VENDU 302	VENDU 303	VENDU 304	VENDU 305	VENDU 306	VENDU 307	VENDU 308	VENDU 309	VENDU 310
4ième étage	VENDU 401	VENDU 402	VENDU 403	VENDU 404	VENDU 405	VENDU 406	VENDU 407	VENDU 408	VENDU 409	VENDU 410
5ième étage	307 000$ 501	186 000$ 502	VENDU 503	VENDU 504	VENDU 505	VENDU 506	VENDU 507	VENDU 508	VENDU 509	VENDU 510
6ième étage	291 000$ 601	VENDU 602	VENDU 603	VENDU 604	VENDU 605	VENDU 606	VENDU 607	VENDU 608	VENDU 609	VENDU 610
7ième étage	VENDU 701	181 000$ 702	VENDU 703	VENDU 704	VENDU 705	320 000$ 706	VENDU 707	VENDU 708	VENDU 709	VENDU 710
8ième étage	VENDU 801	VENDU 802	VENDU 803	VENDU 804	256 000$ 805	324 000$ 806	VENDU 807	VENDU 808	302 000$ 809	219 000$ 810
9ième étage	VENDU 901	VENDU 902	VENDU 903	VENDU 904	260 000$ 905	VENDU 906	VENDU 907	VENDU 908	VENDU 909	VENDU 910
10ième étage	307 000$ 1001	VENDU 1002	VENDU 1003	330 000$ 1004	265 000$ 1005	VENDU 1006	VENDU 1007	VENDU 1008	316 000$ 1009	223 000$ 1010
11ième étage	311 000$ 1101	VENDU 1102	189 000$ 1103	334 000$ 1104	272 000$ 1105	343 000$ 1106	VENDU 1107	251 000$ 1108	320 000$ 1109	225 000$ 1110
12ième étage	315 000$ 1201	189 000$ 1202	191 000$ 1203	338 000$ 1204	VENDU 1205	347 000$ 1206	VENDU 1207	VENDU 1208	324 000$ 1209	VENDU 1210
13ième étage	319 000$ 1301	191 000$ 1302	VENDU 1303	VENDU 1304	278 000$ 1305	VENDU 1306	257 000$ 1307	257 000$ 1308	VENDU 1309	VENDU 1310
14ième étage	VENDU 1401	193 000$ 1402	195 000$ 1403	VENDU 1404	VENDU 1405	VENDU 1406	260 000$ 1407	260 000$ 1408	VENDU 1409	231 000$ 1410

Figure 2. A screenshot from McGill Real Estate website depicting differences for similar apartments situated on different floors

The same strategy is used by a UK developer Dandara Property, which sells two identical apartments (298 and 2118)[8] on 9th and 11th floors with a price difference of 1.5 thousand pounds. The floor plans reflect the identity of two apartments.

c. Non-linear pricing

The most prominent examples of non-linear pricing can be found in Chinese real estate residential markets.

The majority of websites which list off-plan apartment offerings indicate price per square meter for their apartments (lianjia.com, angejia.com, anjuke.com). A listing from anjuke.com[9] offered apartments at a discount, which implies buying first 100 square meters in price range between 50,000 and 120,000 yuan, after which each square meter is priced between 60,000 and 150,000 yuan. Obviously, the company expects a customer to buy an apartment of over 100 square meters, thus she will pay an "entry ticket" of these 100 square meters, after which further square meters will be relatively cheaper as compared to the "entry ticket".

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[8] Apartment for sale in Saint George's Island and 2108 2017/ Dandara.com. – Mode of access: http://www.dandara.com/new-apartments-manchester/saint-georges-island/plot-types-3271-92825
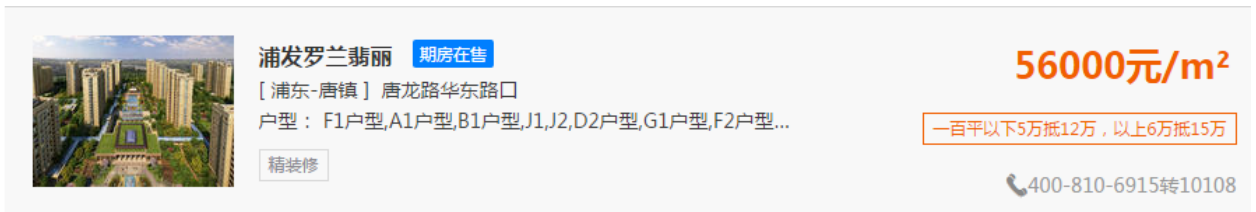[9] Shanghai properties / anjuke.com. – Mode of access: http://sh.fang.anjuke.com/loupan/218161.html

Figure 3. A screenshot from anjuke.com, depicting the "entry ticket" price per first 100 square meters (一百平以下5方低12方).

A similar strategy was observed in Canada: at McGill Real Estate website[10] the apartments in project "Condos Castelnau" are priced in range of $160,000 to $815,000. However, the fine print states that "Price ranges may vary over time depending on sales and the available inventory". Therefore, it is assumed that the prices may deliberately demonstrate non-linear behavior in accordance with the above-mentioned factors.

d. Barriers

A sort of barrier was found on the same Chinese primary market apartment website lianjia.com[11], which offered providing your phone number for a discount (9.6% in case below):

Figure 4. A screenshot from lianjia.com, depicting providing the coupon of 9.6% discount in exchange for telephone number (9.6折)

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[10] Condos Castelnau Phase 4 Villeray Condo / Mcgill Real Estate2017. – Mode of access: http://www.mcgillimmobilier.com/en/condos-castelnau-phase-4-villeray-condo/
[11] Lianjia.com. – Mode of access: http://sh.fang.lianjia.com/detail/feicuimingdu (accessed on 12.03.2016)

This operation is considered a barrier since sharing your telephone number to a company is an action that costs a consumer some effort and, probably, privacy (the company would have their telephone number) exchanged for a discount. Presumably, this helps differentiate customers, since more affluent customers might be reluctant to share their phone number.

Pricing strategies in real estate industry

Overview of pricing strategies

Addressing the issue of price discrimination can not be comprehensive while ignoring the question of price and pricing strategy. It is evident that a company sets the price for their product or product mix in accordance with a number of endogenous and exogenous factors, which may include market conditions, competitive environment, product qualities, production capabilities etc. Therefore, different combination of those factors will produce various pricing strategies for a single or multiple products of the same firm.

Numerous authors provided several taxonomies for pricing strategies by enumerating different sets of factors which influence the price for a company's product. One of the most recent synthesis concerning existing works on pricing strategies was conducted by Rao and Kartono (2009), who reviewed studies starting from the one by Hall and Hitch (1939) to the more modern one of Avlonitis and Indounas(2005), covering in total seven major works in this field. As a result, the authors presented their conceptual model framework for deciding upon a firm's pricing strategy, which was mostly based on the work of Noble and Gruca (1999), enriched by establishing more relationships between the elements of the above mentioned conceptual pricing strategy framework.

The present pricing framework displays that the choice of pricing strategy depends on three major factors: a firm's pricing objectives, pricing strategy determinants (company & product conditions, market & customer conditions, competition conditions) and respondent and firm characteristic. The above mentioned augmentation of Noble and Gruca's pricing strategy framework was adding the latter factor, which normally implies respondent's market power (i.e., the ability to influence the price) and the size of the firm.

Consequently, the authors devise 19 different pricing strategies, which, as the authors claim, can be used both in customer and industrial markets. A clear clustering of this cumbersome number of strategies is not provided by the authors, however, the authors enumerate "situations" in which those strategies can be adopted: "competitive pricing, cost-based pricing,

new product pricing, product line pricing, geographic-based pricing and customer-based pricing".

Strategies suitable for price discrimination in real estate

It can be argued which of those 19 pricing strategies would be used by a real estate firm and whether they would use a single strategy during a long-term period or resort to flexible switching between strategies thus adhering to the changes to one or more of the factors of the conceptual framework.

Hypothetically, a firm may be implementing both *price signaling* and *cost-plus pricing* - the strategies mentioned by Rao and Kartono. In this hypothetical case, the major bulk of the price on a real estate object is to be covered by cost-plus pricing (total production cost plus a profit margin), of which the profit margin is partially or fully covered by price signaling strategy.

In their work the authors further described the price signaling strategy: in this approach the firm is operating in a competitive environment and the customers are assumed to perceive that the price positively correlates both with quality of the product and the resources the firm invested in producing the product. It is also argued that on the basis of the empirical study conducted, the following circumstances increase the chances of a firm to adopt this strategy: impact of the Internet on the industry and the market, capacity utilization and product differentiation.

At this point, it is possible to notice that the above mentioned circumstances under which price signaling strategy is employed do not contradict with the typical circumstances of operating on residential housing market: nowadays Internet allows to search and compare numerous amount of demand of different types of real estate objects; capacity utilization means that the more a real estate firm utilizes resources to build a real estate object, the more likely it will be of better quality which is signaled by higher price; since it is possible to legibly assume that, in general, other real estate companies operating in the market adhere to the positive correlation between price and quality of a real estate object, it means that in general the firms use price to indicate quality difference between the real estate objects.

However, in the original work on the overview of pricing strategies by Tellis (1986), price signaling strategy is displayed in rather negative light. The author refers to it as a strategy, when a company sells a product of inferior quality at a higher price, "with the intention that some customers who can not tell high quality but want it will be fooled". Nevertheless, at the same time the author mentions three necessary conditions for this pricing strategy to be viable, of

which one is that customers must be willing to take enough risk to buy a high quality product even without knowing its quality. As in the scope of this research the customers buy low-cost residential real estate objects, it is possible to draw an inference that a purchase of this kind is a significant expenditure, meaning that it will require considerable amount of their financial reserves (savings or credit resources) in relative terms, which, in turn, could mean that those customers are less risk-averse. Consequently, this notion should be sufficient to question that the pricing strategy employed by firms in the scope of current research resort to the price signaling strategy as presented by Tellis.

On the other hand, Rao and Kartono offer another pricing strategy which could potentially be used to explain the observed phenomenon of price discrimination in real estate: the *perceived value pricing* strategy. In the one of the first works on perceived value pricing, Kortge and Okonkwo (1993) build their model of the perceived value pricing based on model of equity theory, which postulates that input should positively correlate with expected outcome in a certain allowable range. If the result fails to fall in this range, then dissatisfaction is experienced, either on seller or buyer side, depending whether the product point is situated above or below the satisfaction range. Nevertheless, the authors do not provide much insight into how the customer's value perception is measured in this model.

In the explanation of perceived value pricing model by Rao and Kartono, the authors argue that a firm practices this strategy by giving the price in accordance of the customer's perceived worth of this product. Moreover, the likelihood of adopting this strategy is mainly influenced by the ability of the company to accurately estimate the demand for the product.

Drawing the conclusion about the pricing strategy used by real estate firms which allows them to consume more customer surplus, there are two major pricing strategies which could be fit to explain the aforementioned phenomena: price signaling strategy and perceived value pricing strategy. As for the former, this strategy is applicable in the Rao and Kartono's interpretation, however not in Tellis' one. Perceived value strategy in its original interpretation by Kortge and Okonkwo is too vaguely explained from the point of value estimation, as well as Rao and Kartono's one. Nevertheless, the common point in both strategies is that a customer perceives value and the real estate firm tries to extract more consumer surplus by estimating the value of the real estate object for the particular customer.

Nevertheless, it was mentioned that OJSC "Normann" tends to follow a rather different pricing plan – the *price leader strategy,* since they are a low-cost apartment provider and tend to win by providing the best available prices in the local Saint Petersburg market.

Reservation price, willingness-to-pay and its measurement

The term "reservation (reserve) price" was originally used by economists and currently is still mostly used in the field of economics. Anderson et al. (1993) regard reservation price as "the cornerstone of marketing strategy", which underlines the importance of this term in marketing research.

The generally used definition for reservation price given by Jedidi and Zhang (2002) states that reservation price is "the price at which a customer is indifferent between buying and not buying the product". Therefore, a customer is striving to maximize his (consumer) surplus and will not buy the product at a price under which their consumer surplus is negative. Kohli and Mahajan (1991) argue imply that reservation price is the indifference point for a customer between buying the product and abstaining from the purchase.

Since the current research requires dealing not solely with academic literature only on economics, a more comprehensive term needs to be used to describe, in general sense, the price of a customer which he is willing to pay for a product. Winer (2005) has conducted a brief outline of current usage of similar terms, providing one of the most commonly used term for the phenomena concerned – willingness-to-pay (WTP).

Willingness-to-pay: definitions and its proxy role for reservation price

A broad review of various definitions of WTP is presented by Jedidi and Jagpal (2009). All of the above mentioned definitions assume reservation price as a point. However, a few authors interpret reservation price as a range. Ariely et al. (2003) suggest two thresholds: one, above which the customer will refuse to purchase the product, and the other one, below which the customer will surely purchase the same product. Wang et al. (2007) add one more threshold level, which is 50 percent probability of purchase by a customer.

Nevertheless, it is possible to state that the term "reservation price" under the scope of this research is assumed to be equal to "willingness-to-pay" (WTP). This can be concluded from common sense, since those definitions describe the same logical construct which describes the point or range at which customer is indifferent do purchase or not to purchase a product since it leaves almost no consumer surplus, thus connecting the two domains of science – marketing and economics. Moreover, Jedidi and Jagpal (2009) clearly substitute one term for another, which also serves as a proof of equivalency of those two terms. Furthermore, Wang et al. (2007) also champion similar approach to equalizing the term "floor reservation price" and WTP.

Measurement of WTP

An outline for the possible methods of WTP measurement as well as their comparison is provided by Jedidi and Jagpal (2009). The authors divide the methods into two groups: based on purchase data and based on survey or experimental data. As for the former group, WTP measurement from actual data are incentive compatible and free of hypothetical bias problem; nevertheless, this method also suffers from such disadvantages as limited number of price combinations observed, as historical observation can not be manipulated to provide for different products, or the data may not reflect all the information about WTP (Wertenbroch and Skiera, 2002).
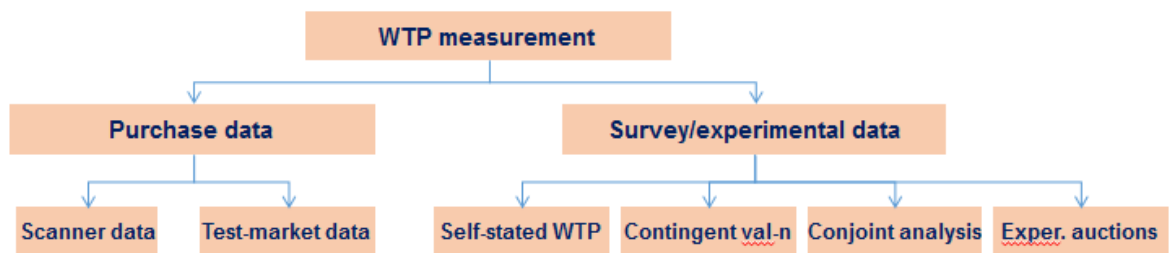

Figure 5. WTP measurement taxonomy by Jedidi and Jagpal (2009).

The group of methods based on survey or experimental data contain the following methods: self-stated willingness-to-pay, contingent valuation, conjoint analysis and experimental auctions.

The authors are arguing that observing **WTP by self-stating** is likely to produce erroneous results due to several reasons. First of all, if consumers are not required to purchase the product for which WTP is measured, thus producing hypothetical bias. Second of all, Jedidi and Zhang (2002) found out that consumer tend to overstate their WTP for well-known brands and understate it for less known brands.

Contingent valuation is another widely-used method to obtain consumers' willingness-to-pay for a product. An interviewer presents the characteristics of a product and announces the price for it, asking the consumer whether he is ready to pay the announced price. Thus, a positive answer would indicate that the customer is ready to pay *at least* the price. Further, the responses from multiple customers are used to build the demand curve for the product. Whereas the method is relatively easy to put into practice, the method may require several iterations per single customer to obtain a positive answer and even sequential approach (Lusk and Hudson, 2004) is subject to starting-point bias. Furthermore, some researches revealed that this method is also can be subject to hypothetical bias (Bishop and Heberlein, 1986).

In **conjoint analysis,** two modes of conducting it are available: rating-based and choice-based conjoint (CBC) methods. In the rating-based method customers are presented with several product profiles, while being asked whether they would consider purchasing it. In the next step, the customers are asked to rank the products within the already picked consideration set. As for the CBC method, a customer is presented with several sets of product profiles, with the request to pick at most one from each set. It is also important to include a no-purchase option as one of the alternatives for the customer (Jedidi et al., 2003). The result of such a conjoint analysis is a utility function, which describes customers' preferences for the attributes of a product. The authors claim that since the CBC method is to a significant extent similar to actual shopping experience, it can be implied that hypothetical bias with this method can be minimized.

The authors also provide an outline of possible **experimental auctions**, which include a broad range of variation of auction-based ways to identify WTP, such as the English auction, the Dutch auction, the BDM method, the first-price sealed-bid auction et cetera. However, from the very outset the authors point out that this method of measuring willingness-to-pay is not suitable for durable goods, which makes the further observation of this method unnecessary for the research. The unsuitability of experimental auctions for durable goods is explained by the fact that since in these auctions people spend real money (which eliminates hypothetical bias) for the sake of experiment, the customers will be unwilling to spend significant amounts of money (as to purchase an apartment) for experiment causes.

Another comparison of different approaches to measuring WTP is contributed to Miller et al. (2011). The authors distinguish between direct and indirect approaches to measure WTP, as well as whether those methods measure actual or hypothetical WTP, thus including the existing methods in a 2x2 matrix below.

WTP measurement methods taxonomy

Context	Measurement	
	Direct	*Indirect*
Hypothetical WTP	OE question format	CBC analysis
Actual WTP	BDM mechanism	ICBC analysis

Figure 6. WTP measurement methods taxonomy by Miller et al. (2011)

The group of methods which measure hypothetical WTP include **open-ended question format** and **choice-based conjoint analysis** (CBC). However, the researchers upfront claim that

the methods aimed to measure hypothetical WTP are subject to hypothetical bias, whereas the results obtained by those methods can turn out to be inaccurate due to "technical and psychological reasons".

The direct approaches include Becker, DeGroot and Marschak mechanism (**BDM mechanism**), which implies that if a customer draws from a lottery a price which is equal or lower than his actual WTP, then he is obliged to buy the product, which literally transforms it into a type of an experimental auction. The indirect approach to evaluate actual WTP is the incentive-aligned choice-based conjoint (**ICBC**) analysis, where customers reveal their preferences, after which they are also obliged to buy the product on the basis of BDM mechanism, which is also a type of an auction.

Despite stressing the obvious benefits of the incentive-aligned methods, the findings of the paper reveal that the demand curves obtained from the hypothetical methods are not significantly different (from the statistical standpoint) from those obtained by using actual (incentive-aligned) methods. Furthermore, the incentive-aligned methods produced curves which were close to the real purchase data, which were treated by the researchers as the benchmark of the real WTP.

WTP and customer characteristics in the real estate industry

It is legit to assume that a real estate objects are consisted of several characteristics, which can be treated as separate goods (Lancaster, 1971). However, those goods are not traded explicitly on the market, instead, a real estate object is traded as a composite good, to the price of which different inherent characteristic of this good are contributing (Palmquist, 1984).

Thus, it is inferred that customers have their prices which they are ready to pay for a real estate object. As it has already been said, in the above established conceptual framework a real estate object is a composite good, which leads to an assumption that customers may have individual reservation prices for each characteristics of such a composite good. Consequently, the estimation shifts from those of the reservation price for the whole real estate object to estimation of reservation prices for each of the inherent characteristics (Ridker and Henning, 1967). In this regard, such prices are referred to in econometrical literature as *hedonic prices* (Court 1941, Tinbergen 1951).

Rosen (1974) and Freeman (1979) are the main contributors to the elaboration of a hedonic pricing regression model, which represents the locus of equilibriums of consumers and suppliers, without giving much detail about demand and supply. However, Bartik (1987)

critiqued this approach addressing to the fact that hedonic estimation problem is not arising from the interaction of supply and demand, which is reinforced by a logical conclusion that individual consumer's decision does not affect suppliers, since individual consumer does not influence the hedonic price function.

While WTP is concerned, it is possible to assume that willingness-to-pay for the same real estate object could be different for various customers. Under such an assumption, it can be explained for the following point: since according to Rosen, an apartment is considered a composite good, consisting of multiple characteristics, different customers may have different functions for hedonic prices for those single goods in an apartment. Thus, the total price for an apartment must be equal to the sum of the hedonic prices for single units of composite goods of an apartment (amenities, location et cetera).

Consequently, the inference from this assumption is that since the functions for various hedonic prices are different for different customers, the total sum which customer is ready to pay (his willingness-to-pay) must also be different for the same real estate object. As a result, if a company offers the same price to all customer segments, it overlooks an opportunity to extract more consumer surplus from those customers who are willing to pay more for particular hedonic goods.

However, as it has already been mentioned, while the statement above implies that hypothetically a firm should maximize the revenue from each consumer by providing them with a price that would maximize the company's profit, from the point of view of common sense, it is virtually troublesome to find out an individual price function of each customer. Instead, a firm can reveal that certain categories of customers tend to have particularly higher hedonic prices for particular hedonic goods of an apartment.

Therefore, the company must discover a way on how to distinguish between those groups, which will have higher WTP from those having lower reservation prices. One of the proposed ways is to establish a statistically significant correlation between higher WTPs for certain hedonic goods and observable characteristics of those customers.

However, there is empirical evidence that there could be either no difference in reservation prices for the same apartment or no correlation between observable characteristics and WTP.

Paul M. Anglin in his article "Determinants of Buyer Search in a Housing Market" postulates that when search of a house is conducted by a buyer, the certain characteristics of

buyer (age, sex, etc.) do not affect search duration (Anglin, 1997). This implicitly may mean that there is no difference in reservation prices between customers, since it is assumed that during the process of search initial real estate prices are viewed by customers and compared to their own reservation prices for the intended purchase. On the other hand, this connection between search and actual willingness-to-pay might turn out to be non-existent.

Research gap, objectives, delimitations and organization of the study

As it has already been mentioned, the *research gap* to be bridged by this particular study is the absence of research on the viability and techniques of price discrimination in real estate markets. Whereas the existing model by Rosen and Sherwin explains how the hedonic price for an apartment is formed on the basis of hedonic characteristics, it does not say anything about the influence of other factors on the reservation price for the apartment, such as personal characteristics of a customer. Therefore, in order to overcome this problem, the study will aim to bridge this gap by conducting a limited research of clients of a Russian real estate company, who have already purchased apartments from this company and who will be willing to share their reservation prices for the sake of research, which is then to be correlated with their observable and non-observable characteristics.

Whereas self-selection price discrimination is widely used and is proven to be viable, those measures in general require preliminary planning of their usage, such as the number of pre-decorated apartments, the planning of the apartments, etc. On the other hand, price discrimination based on visible characteristics is more handy, since it can be done with no or insignificant prerequisite preparation of managers.

Thus, the *objectives* of the study are as follows:

3. Identify the possibility of conducting price discrimination for a real estate company
4. If the possibility is identified, identify ways on how price discrimination based on visible characteristics can be used by real estate managers.

However, the major *delimitation* of this study is that the data is provided by only one company operating on Russian real estate market and it is operating solely in one city – Saint Petersburg. Furthermore, the company is specializing mostly on constructing and selling of the so-called "low-cost" apartments – apartments which include only one or two living rooms with bathroom facilities and a kitchen. Therefore, the results of this study can only be generalized under a range of assumptions, including the following:

1. The characteristics of consumers in real estate markets are similar throughout the Russian Federation.
2. The real estate markets are similar throughout the Russian Federation in terms of the supply of apartments.
3. The apartments supplied by "low-cost" real estate markets are similar throughout the Russian Federation.

At this point, it is already possible to point out that in some regions of the Russian Federation (e.g. the Sakha Republic) the adverse climate conditions require the apartments to be built in accordance with particular regulations. This fact inherently undermines the third assumption. Nevertheless, most of the residential dwellings in Russia are constructed in regions without the regulations of this kind; hence, the assumption is true to a significant extent.

The current study is organized in the following manner: firstly, an applicable research method will be selected. Secondly, the data sources, as well as data collection methods, will be defined. Thirdly, a sample will be collected and described. Next, according to the data available the hypotheses will be stated aimed at closing the mentioned research gap. Further, the research methodology to prove or disprove the hypotheses will be outlined. Finally, the results of the study will be presented and discussion of those results will follow with possible scientific and practical contributions.

2. EMPIRICAL RESEARCH OF PRICE DISCRIMINATION IN REAL ESTATE MARKETS

Choosing the research method

The pieces of information which are required to obtain from the customers are their actual purchase price, their reservation price and the various characteristics of those customers. Whereas the latter can generally be observed and does not require the immediate interaction with a customer and the actual purchase price is stored in the archive data of the company providing the data for the research, the reservation price is an unobservable characteristic which requires interaction with the customer.

From the available methods of empirical research, two can be employed under the scope of this study: the **experiment** method and the **survey** method.

As for conducting the full-scale **experiment** on revealing the reservation prices, it is possible to employ some of the practices from non-durable goods research, for example, by doing an experimental auction for the goods, where the actual point-of-sale experience is simulated (which includes requiring the customer to purchase the product), which allows to minimize most of the possible biases (Becker et al, 1964). However, the main stumbling block is the inability to conduct such an experiment with apartments due to their significant price and value for customers.

On the contrary, the **survey** method, despite including the hypothetical bias in most of the cases on inquiring about the price, is viable in terms of the available resources in the scope of a master thesis, and, allows obtaining the results which would reliably reflect the actual willingness-to-pay of the customers if a corresponding WTP measurement method is employed. Moreover, the method can potentially be used not only to collect the information about the reservation prices of a customer, but also allows other questions concerning unobservable characteristics (e.g. income, marital status, et cetera) to be included in a questionnaire, which makes the research more flexible in terms of the availability of testing multiple hypotheses on the single set of data.

Hence, the current study will employ the survey method due to its viability and relative reliability. The further discussion on possible methods to reveal the customers' willingness-to-pay (under the scope of this research is equivalent to the reservation price, as mentioned in the previous chapter) will follow below.

Survey design

Since the research method chosen for this particular study is surveying, the data on customers of real estate companies will be obtained through surveying. The survey was conducted by the managers of OJSC "Normann" and the customers surveyed were the customers of this company.

Before all, it is sensible to describe OJSC "Normann" and its positioning in the primary real estate market in Russia. OJSC "Normann" was founded in 2004 in Saint Petersburg. Currently it is the twentieth largest construction company in Russia[12], operating mostly in Saint Petersburg and Leningrdaskaya Oblast. The company itself is a vertically-integrated holding, which serves as a constructor, developer and contractor. It is focusing on providing low-cost dwellings with high-quality standards, with apartments in blocks of flats sized from one- to four-room. As of 2016, the total floor space currently under construction of about 500,000 m^2 [13].

As for the vertical integration, OJSC "Normann" has all the capabilities to start and support projects on each step of the construction process: it has enough financial resources to serve as a developer (investor), can independently design and project the construction of residential housing, able to employ their own construction companies' resources to perform the construction and has subdivisions responsible for selling the property owned. Moreover, several subdivisions also provide professional real estate consulting services, including legal and technical services in the domain of real estate.

In order to increase incentive-compatibility of the research method, the customers were surveyed after they had purchased an apartment. Moreover, in order to compare the actual price of the purchase of a particular apartment with the reservation price of the same apartment, it is necessary for the deal to be closed. Otherwise, if the survey is conducted before the deal closure it may bias the customers to lower their reservation price and leave no incentives to reveal their actual reservation price. Thus, the actual deal closure price will also be lowered, therefore producing biased results. On the contrary, after the customer has already agreed on the price he theoretically may have less incentive to distort his actual reservation price for the deal.

It is evident that the customers surveyed had bought different apartments, which would violate the assumption of holding the characteristics of the apartment. However, this can be resolved by collecting the information on the purchased apartments from the company, which

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[12] Опубликован рейтинг девелоперов по объемам строительства жилья в России/ РБК. – Mode of access: https://realty.rbc.ru/articles/29/07/2015/562949996352680.shtml
[13] О Компании / «Норманн». – Mode of access: http://www.normann.ru/about

will allow comparing the apartments bought and sort the customers into buckets in accordance to the similarity of the apartments they purchased. Otherwise, if a sufficient number of observations is collected in one of the buckets, the study may very well limited to generalizing the inferences made on the basis of this bucket.

Speaking about the number of observations, it is expected to obtain no less than 30 observations per each bucket of different types of apartments, so that it will allow using most of the statistical methods for testing the hypotheses in accordance with the central limit theorem. In the optimistic scenario, each bucket will contain no less than 70 observations. In case the minimal required number is not obtained in the time allocated for the research, the assumptions of the homogenous character of the apartment might be further reinforced, thus allowing more actual differences in apartments, which would be considered to be of zero value for the customer in terms of hedonic prices. This measure will make merging of the buckets available, thus increasing the number of observation to the minimal required number and higher.

Choosing the method to measure WTP

As it has been described in the first chapter, the taxonomy which will be used to evaluate possible ways to measure a customer's WTP is proposed by Jedidi and Jagpal (2009).

The measurement methods can fall into one of two categories: purchase data and survey/experimental data.

The first group of methods – **purchase data** – supposes archival research methodology: the data on customers' WTP is collected on the basis of the history of purchases. In the light of current research, this method is beneficial due to the following reasons:

1) The provider of data, OJSC "Normann", stores the data about their sales and some information about the customers who did those purchases of apartments;
2) The data is readily available;
3) The data is free of *hypothetical bias*, since customers did actually but those apartments;
4) The data is incentive-compatible, which means that the method is providing an incentive to customers to provide their real WTP. In this regard, the customers have already conducted the purchase and they have no incentive to distort their actual WTP.

Nevertheless, the purchase data analysis method has one major disadvantage: it provides limited information about customers' WTP. This implies that the information only shows the

price which was below the threshold of the ceiling reservation price without revealing the customers' surplus, which does not allow to build an accurate demand curve for an apartment.

The group of survey/experimental methods includes four major ways to measure customers WTP. Those are self-stated WTP, contingent valuation, conjoint analysis and experimental auctions. The former three methods consider survey research method to be used, whereas the latter implies employing experiment research method.

The first method of **self-stating WTP** is the simplest one in terms of the required efforts both from the interviewee and interviewer sides. In essence, the customer is asked a straightforward question aimed at revealing his WTP. However, the main disadvantage of this method is that the method is highly prone to *the hypothetical bias*. Furthermore, the method is incentive-incompatible. As Jedidi and Zhang (2002) have revealed, customers generally tend to overstate their WTP when surveyed by this method.

Under the second method of **contingent valuation**, the customer is asked dichotomous questions about his reservation price and this procedure is iterated until the actual reservation price or its range is obtained. For instance, the customer is asked "Would you agree to buy an apartment for X rubles?", and if the customer replies negatively, the interviewer iterates the procedure by asking "Would you agree to buy an apartment for X-t rubles?", where t is the step size. The described method is also relatively easy to implement. Nevertheless, the method is also prone to *the hypothetical bias*, as well as *the starting-point bias*, which means that the result of the survey can be different with different starting points. On top of that, this method provides no incentive to the customer to reveal their actual WTP and can be cumbersome if the step is too small or starting point is chosen too far from the actual reservation price.

The third method – **conjoint analysis** – is divided into two types: rating based and choice based (CBC). The method, as it stated by Jedidi and Jagpal, is aimed at minimization of *the hypothetical bias* and incentive-compatible, since it allows the customers to choose the most suitable option for them from the options given. The main stumbling block of using this method is the necessity to develop the sets of products, in which the data provider can be limited (the number of construction projects available) and the requirement close collaboration with the data provider, since the choice of the sets of the apartments and the prices for those sets in order to eliminate the possible pre-selection biases.

Finally, the **experimental auctions** method is clearly not viable in the light of current research, since it is inapplicable to durables (real estate also falls into this category) due to their significant price.

To conclude, under the scope of this research the decision was made to use the **self-stated WTP method**, as it allows obtaining the largest amount of observations in the harsh constraints of time and budget. However, the general limitation of this research will be the hypothetical bias, which will be discussed later in this work in the limitations section.

Sample description

The survey results are provided by OJSC "Normann" which conducted the surveying of their customers in 2015. The customers were surveyed by the company's managers after a customer had closed the deal on purchasing the apartment. Overall, the survey results contain 565 observations which were collected from January to December 2015. However, the customers have purchased apartments of different size (studio, 2-room, 3-room or 4-room), which allows distributing the customers into buckets concerning the purchased apartment size.

Apartments from OJSC "Normann" survey segmented by number of rooms

Number of rooms	Number of observations
1	378
2	139
3	36
4	8

Table 1. The buckets of the apartments by size

As it could be observed from the table above, most of the observations fall into the first bucket of studio apartments. Since it is necessary to control for the apartment characteristics in order to reveal the influence of other independent variables concerned with customer, the models will be built on the basis of the observations from the largest bucket to provide the highest number of observation, which would improve the reliability of the study. Furthermore, as it will be mentioned below, some of the data pieces might be missing for the observations, thus further reducing the number of usable observations in each of the buckets. Consequently, choosing the largest bucket will also reduce the possibility of not having enough observations to draw reliable inferences.

The questions of the survey can be divided into several groups:

1) Technical part: interviewer name, code number of the interviewee (the surveys were anonymized), survey date, et cetera;

2) Purchased apartment part: the type of the apartment purchased (number of rooms in the apartment), the price at which the deal was closed;

3) Purchase conditions part: the information on whether other offers of apartments from competitors were considered, whether the purchase was made on special conditions (e.g., special offering)

4) Reservation price part: the information on customer's reservation price per square meter of the apartment and overall price for the whole apartment. The questions asked included price ranges at which the customer would consider buying from a competitor and the range at which the customer would refuse to buy an apartment;

5) Transportation part: the information on the customer's usual transportation routes, the major means of transportation used, commute time, etc.;

6) Purchase intentions part: the intention for further use of the apartment (dwelling/investment), whether the customer is going to resell or lease the apartment, the reasons for the purchase (moving from another city, improving living conditions, et cetera), previous living conditions, etc.

7) Purchase funding part: whether a mortgage was used to purchase the apartment, the portion of the sum paid for the new apartment from selling the previous apartment

8) Observable characteristics part: customer age, gender, occupation

9) Unobservable characteristics part: customer income, car ownership, marital status, the family size, etc.

It is important to mention that some of the observations miss particular pieces of data in the parts described above. Thus, if an observation is used in the model and lacks the particular piece of data which must be used in the model, the observation is excluded from the sample used in the model. The decision not to use data imputation methods is dictated by the fact that it is expected that some of the variables used will be dummy-coded and data imputation based on mean may lead to biased results.

As it has previously been mentioned, the survey will incorporates several groups of questions concerning the characteristics of the customer.

In general, the customer characteristics can be divided into observable and unobservable ones. The difference between those categories can be described as whether the information about those characteristics can be obtained without the inquiring the customer herself. If the

information is evident (gender, in most of the cases) or can be obtained from open data sources (car ownership, then the characteristic is considered observable; otherwise, if the data can be obtained only by inquiring the customer (the reason for the purchase of a real estate object), the characteristic is unobservable. Nevertheless, in some instances the given framework of distinguishing between those characteristic can change, depending on the situation or the nature of the data. For instance, the data about financing the purchase of an apartment can be either obtained through corresponding financial institutions (in which case it would be regarded as an observable characteristic) or might only be available on an inquiry from the customer itself, if the purchase is financed from the customer's personal savings.

As it can be concluded from the character of the characteristics described above, the current research is of both exploratory and explanatory character, since the set of characteristics chosen is based both on the necessity of including some evident characteristics and the empirical observations of the employees of the company providing the data. At the same time, some of the characteristics are included without clear observations of possible effect on the reservation price (car ownership).

As for the reservation price, in this current research the answer for the question "At which price per apartment you will consider switching to the competitor?" will be taken as the reservation price for this customer. The rationale behind this decision was that this response helps to indicate a price point which definitely lies in the price reservation range, whereas the question "At which price per apartment you will not consider buying an apartment at all?" may lead to biased results due to possible intention for a customer to inflate the prices over their actual reservation price range due to ambiguous question wording.

Hypotheses

On the basis of the above described survey contents, as well as the stated objectives of this paper, the following hypotheses will be tested in the current research:

1. **The reservation prices of customers for the same apartment in primary real estate market in Russia are significantly higher than the actual prices paid.**
2. **There is a significant correlation between the reservation price for an apartment of a customer and his observable or unobservable characteristics.**

In this regard, the hypotheses are also required to be based on several assumptions.

First of all, the formulation of "the same apartment" is quite hypothetical, since in essence, every single apartment is unique in various regards: the floor number, the cardinal direction to which the windows are directed, the apartment layout, et cetera. Thus, the wording of "same apartment" implies that the apartment is the same from the point of view of *a construction company*, so that the company did not incur significantly higher marginal cost of building the apartment (such as, the apartments with the same layout situated on the same floor but with windows overlooking different cardinal directions from the standpoint of constructor have the same marginal construction cost). At the same time, building an *additional floor* of an apartment is surely to cost more for the constructor, which violates the assumption of the same marginal cost. However, since the project and the blueprint of a building is agreed upon upfront the construction, the construction company in practice does not decide to build an 8-storey building instead of an originally planned 10-storey one. Moreover, the building projects are typically standardized and any changes even in reducing the number of floors may actually incur higher marginal costs.

Consequently, proving the insignificance of marginal costs for apartments which are considered to be "similar" under the scope of this research is actually a topic for a standalone research. Hence, under the limitations of a master thesis the above mentioned assumption on the similarity of the apartments will hold.

Second of all, as it has already been discussed, the possibility of extrapolation of the observations on the whole Russian market based on the data provided by a single company specializing on a niche type of apartments is also valid under a set of assumptions. Nevertheless, since the type of dwelling provided by the company is quite popular in Russia[14], the generalization of the findings will be valid to a certain extent.

Methodology

Reservation and actual prices differences

In order to discover whether different customers are willing to pay significantly different amounts of money for supposedly the same apartment (as the first hypothesis states), it is possible to employ the paired-samples t-test to discover the significance of the difference between the actual price and the reservation price in a group of customers:

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[14]Где живут россияне/ Xmetra.ru – Mode of access: http://www.xmetra.ru/news/flats/Gde_zhivut_rossiiane.html

$$t = \frac{\overline{D} - \mu_D}{\frac{S_d}{\sqrt{N}}}$$

, where t – is the t-statistic for the test, $\overline{D}$ is the actual mean difference between the samples, μ_D is the null-hypothesis predicted mean difference between the samples, S_d is the standard deviation and N – the number of observation. In regard to this particular study, $\overline{D}$ will be the mean difference between the reservation price and the actual closure price for the chosen observations, and μ_D will be equal to zero, since the goal is to prove that the difference is statistically significant from being 0, i.e., the reservation price is not equal to the actual price agreed upon eventually.

The choice of the paired-sampled t-test is dictated by the fact that the sampling of the two sets of data – the reservation prices and actual prices – was basically made from the same people, which means that the values are based on the related data.

In this regard, it is possible to run multiple t-tests inside the bucket of the customers, which were distributed in accordance with the size of the apartment purchased. However, the possibility of running a t-test in each bucket will be dependent on the total number of observations in the bucket which contain the information about the reservation price.

Nevertheless, before running the t-test it is necessary to ensure that the sample satisfies the requirements of the normality of the distribution of the observation. In this regard, a number of normality tests will be run to ensure that the necessary assumptions for the parametric tests are holding:

- Additivity and linearity;
- The normality of the distribution (P-P plotting, Kolmogorov-Smirnov test);
- The homogeneity of the variance (residual plotting, Levene's test);
- Independence.

In case the above mentioned assumptions are not met, this will mean that the use of non-parametric test is required. Under these circumstances, the non-parametric analogue of paired-samples t-test will be used: the Wilcoxon signed-rank test.

Reservation prices and customer characteristics

In order to reveal the influence of various observable and unobservable characteristics of a customer on her reservation price in accordance with the second hypothesis, it is possible to

use an augmented Rosen (1974) model, which would (under a set of assumptions) control for the apartment's inherent characteristics, which define the hedonic price for the apartment for the customer on the basis its "components" (amenities, size, et cetera), and manipulate the characteristics of the customer. Given the required task, the following *multiple regression model* will be implemented.

Originally, the Rosen's hedonic price model is describing how the incremental characteristics of an apartment predict the perceived value of a client for this apartment:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_n X_{ni} + \varepsilon_i$$

, where Yi is the perceived value for the apartment (dependent variable), β_0 is the intercept for the perceived value, $\beta_{1..ni}$ are the slopes of Y with variables $X_{1...ni}$, whereas $X_{1...ni}$ are the "components'" presence in the apartment, which adds to the perceived value of the apartment for the customer, and ε_i is a random error term for the observation.

However, in this study the variables which describe the hedonic prices for the components are assumed to be hold constant, so that the multiple regression model described above is modified in the following manner:

$$Y_i = \beta_0 + \beta_1 X_{1ci} + \beta_2 X_{2ci} + ... + \beta_n X_{nci} + \varepsilon_i$$

, where Yi is the customer's reservation price for the apartment, and β_0 is the intercept defined by the hedonic prices described above, which is held constant to isolate the effects of the observable and unobservable characteristics on the reservation price, $\beta_{1..ni}$ are coefficients of variables $X_{1ci...nci}$, whereas $X_{1ci...nci}$ are the consumer characteristics which potentially influence the reservation price of this customer, and ε_i is a random error term for the observation.

Thus, by manipulating the independent variables it will be possible to observe the change in explanatory power of different variables in the model on the dependent variable (reservation price). Since the number of available independent variables is limited by the data available from the survey, the number of iterations to find the model with the best explanatory power is small enough to be completed under the scope of a maser thesis work.

However, as it has been with the t-test, a range of assumptions must hold true in order for the regression analysis to produce reliable results. In order to ensure that, a number of test will also be run simultaneously with testing the combinations of different independent variables to diagnose the following:

- The normal distribution of the error term (P-P plotting);
- Homoscedasticity of the error term (Residual plotting);
- Multicollinearity (VIF values);

In case the data will not satisfy the above mentioned conditions, the appropriate data transformation will be considered to normalize the data.

Variables

In the two tools chosen for testing the hypotheses the same variables will be used which will be coded from the survey data provided by OJSC "Normann".

As it can be observed below, some of the variables out of those described in the sample description part were not included in the so-called "short-list" after the first funneling: the variables from means of transport, funding and special offerings were omitted due to considerations that those variables may have no effect on the reservation price for the customer.

Thus, the variables' list after the first funneling is as follows:

Variables after the 1st funneling

Role	Name	Variable	Measure	Type
Dependent	*R_price*	Reservation price	Rubles	Scale
Control	*Rooms*	The number of rooms in the apartment	Amount of rooms	Ordinal
Independent	*Age*	Customer's age	Years	Ordinal
	Gender	Customer's gender	0 – male, 1- female	Nominal
	Intent	The stated purchase intention: for dwelling or as an investment	0 – for dwelling, 1 – for invsetment	Nominal
	Educ	The stated education of the customer	0 – secondary, 1- vocational, 2 – higher, not finished; 3 – higher, 4 – two higher, 5 - postgraduate	Nominal
	Auto	The possession of an automobile by the customer	0 – no, 1- one car, 2 – 2 cars, 3 – 3 cars and more	Ordinal
	Occup	The customer's stated occupation	0 – student, 1 – employee, 2 – manager, 3 – businessman, 4 – pensioner, 5 – temporarily unemployed, 6 –housekeeping, 7 - other	Nominal

	Reason	The customer's stated reason for the purchase	0 – moving from another city, 1 – moving from another country, 2- improving the living conditions, 3 – divorce, 4 – marriage/cohabitation, 5 – dwelling for the parents	Nominal
	Income	The customer's stated income	0 – between 15000 and 25000 rubles, 1- between 25000 and 40000 rubles, 2 – between 40000 and 60000 rubles, 3 – between 60000 and 80000 rubles, 4 – between 80000 and 100000 rubles, 5 – over 100000 rubles	Ordinal
	Financ	The source of the financing for the purchase of the apartment	0 – sold real estate, 1 – used mortgage financing, 2 – used loan financing, 3 – used instalments, 4 – used savings, 5 – used money from relatives and friends	Nominal
	Pr_liv	The previous living conditions of the customer	0 – lived in parents' house, 1- own apartment, 2 – rented apartment, 4 – dormitory, 5- multifamily unit, 6 – other	Nominal
	Fm_size	The number of family members intended to dwell in the purchased apartment	Number of people	Scale

Table 2. The description of the variables chosen from the survey.

However, out of the variables listed above some variables had to be omitted during the second funneling. The reasons behind that are as follows:

- Intent – the SPSS engine after several attempts of including those variables in the regressions both stepwise and simultaneously produced the result of missing correlations for those two variables. Since those variables are dummy-coded, no data manipulation can be done in those cases, which resulted in excluding those variables from the analysis.

- Reason, previous living conditions, income – insufficient amount of observations. It is supposed that the major reason for the reduced data set is the reluctance of customers to share the sensitive data, which was explained previously and is attributed to the *non-incentive bias*, meaning that in the selected mode of collecting the data the customers have no incentive to disclose the sensitive information about

themselves and their purchase. Furthermore, some data pieces could have been not provided by OJSC "Normann" due to the non-disclosure reasons.

Therefore, the final list of variables used in the testing of the hypotheses can be found in Table 2a.

Variables after the 2nd funneling

Role	Name	Variable	Measure	Type
Dependent	*R_price*	Reservation price	Rubles	Scale
Control	*Rooms*	The number of rooms in the apartment	Amount of rooms	Ordinal
Independent	*Age*	Customer's age	Years	Ordinal
	Gender	Customer's gender	0 – male, 1- female	Nominal
	Educ	The stated education of the customer	0 – secondary, 1- vocational, 2 – higher, not finished; 3 – higher, 4 – two higher, 5 - postgraduate	Nominal
	Auto	The possession of an automobile by the customer	0 – no, 1- one car, 2 – 2 cars, 3 – 3 cars and more	Ordinal
	Occup	The customer's stated occupation	0 – student, 1 – employee, 2 – manager, 3 – businessman, 4 – pensioner, 5 – temporarily unemployed, 6 –housekeeping, 7 - other	Ordinal
	Financ	The source of the financing for the purchase of the apartment	0 – sold real estate, 1 – used mortgage financing, 2 – used loan financing, 3 – used instalments, 4 – used savings, 5 – used money from relatives and friends	Nominal
	Fm_size	The number of family members intended to dwell in the purchased apartment	Number of people	Scale

Table 2a. The description of the variables chosen from the survey and funneled again.

3. RESULTS, FINDINGS AND DISCUSSION

Results for difference in reservation prices

In order to reveal the difference in the reservation prices, two variables from the observations from 1-room bucket were used: the actual price at which the deal on the purchase of this apartment was closed (*cl_price)* and the response to the question of the reservation price per apartment asked after the deal was closed, at which the customer would consider switching to a competitor (*r_price*).[15]

As it can be observed, the sample included only 33 observations due to the data collection imperfections: the data provided only had this number of observations in the 1-room bucket, which had both the reservation price indicated by the customer and the actual deal price. According to the observations, in most of the cases the actual deal price was omitted, which, as it is possible to assume, was done by the data providing company for non-disclosure reasons.

The descriptives of the data obtained are presented below:

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[15] «При покупке квартиры какая цена за квартиру показалась бы вам достаточно высокой, чтобы сменить застройщика»

Descriptives

			Statistic	Std. Error
	Std. Deviation		343452,00582	
	Minimum		1,15E+006	
	Maximum		2,50E+006	
	Range		1350000,00	
	Interquartile Range		500000,00	
	Skewness		,259	,409
	Kurtosis		-,204	,798
	Mean		1435030,3030	42346,14497
	95% Confidence Interval for Mean	Lower Bound	1348774,0284	
		Upper Bound	1521286,5777	
	5% Trimmed Mean		1432777,7778	
	Median		1500000,0000	
	Variance		59175467803,	
CI_price	Std. Deviation		243260,08263	
	Minimum		1,03E+006	
	Maximum		2,00E+006	
	Range		972000,00	
	Interquartile Range		345000,00	
	Skewness		-,293	,409
	Kurtosis		-,353	,798

Table 3. Descriptives for the price of the closed deal and stated reservation price.

A range of normality tests has also been run on the sample described above:

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
R_price	,129	33	,179	,960	33	,255
Cl_price	,211	33	,001	,908	33	,009

a. Lilliefors Significance Correction

Table 4. Test of Normality for reservation price and corresponding customer's actual price of the closed deal.

As it can be concluded, the data is not normally distributed according to Kolmogorov-Smirnov test statistic's significance for *r_price*, which restricts any proper usage of the parametric tests. Hence, instead of the above mentioned dependent t-test, its non-parametric will be used: the Wilcoxon signed-rank test. The SPSS output of this test run on the above mentioned non-normalized sample is presented below:

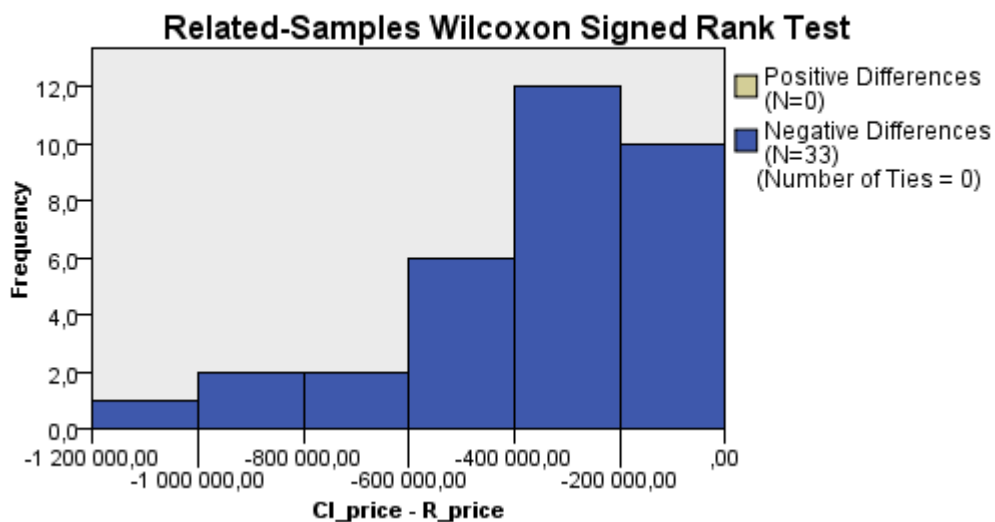Figure 7. Wilcoxon signed-rank test output for reservation price and corresponding customer's actual price of the closed deal.

Related-Samples Wilcoxon Rank Test Statistics

Total N	33
Test Statistic	.000
Standard Error	55,948
Standardized Test Statistic	-5,014
Asymptotic Sig. (2-sided test)	.000

Figure 7a. Wilcoxon signed-rank test statistics output.

According to the Wilcoxon signed-rank test, the difference between the means is statistically significant, which allows to reject H_0 and claim that there is a difference between the actual price at which the deal was closed and the reservation price of a customer for this particular apartment. Despite the fact that the test was two-tailed, the difference is interpreted in the way that reservation price is significantly higher than the actual price for this deal, as it can be seen from Figure 7, which indicates only negative differences between actual closure price and reservation price.

Results for reservation prices and customer characteristics

In order to test the hypothesis considering the influence of the observable and unobservable characteristics of a customer on their reservation price, the following multiple regression model was used:

r_price = β_0 + β_1*Age + β_2*Gender + β_3*Occup + β_4*Auto + β_5*Educ + β_6*Financ + β_7*Fm_size

Hence, the regression above is aimed at discovering the coefficients of the variables which describe observable and non-observable characteristics of the customer.

The description of the sample of the variables is included below:

Descriptive Statistics

	Mean	Std. Deviation	N
R_price	1839423,08	219738,710	104
Gender	,57	,498	104
Age	40,08	13,479	104
Educ	2,38	,987	104
Auto	,92	,664	104
Occup	1,54	1,198	104
Financ	3,7596	2,14745	104
Fm_size	2,4519	1,07829	104

Table 5. Descriptives for the multiple regression model's dependent and independent variables

The above described sample originally included 378 observations, but in the preliminary sample only 135 observations were included due to numerous missing values for some of the crucial variables (*r_price, cl_price)* were omitted. The sample was afterwards trimmed to 104 observations in order to exclude the outliers which were the reason for the violation of the normality assumptions.

In order to ensure the applicability of the multiple regression, it is necessary to test the dependent variable on the basis of the necessary normality assumptions. The P-P plot for the untrimmed *r_price* is outlined below:

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: R_price
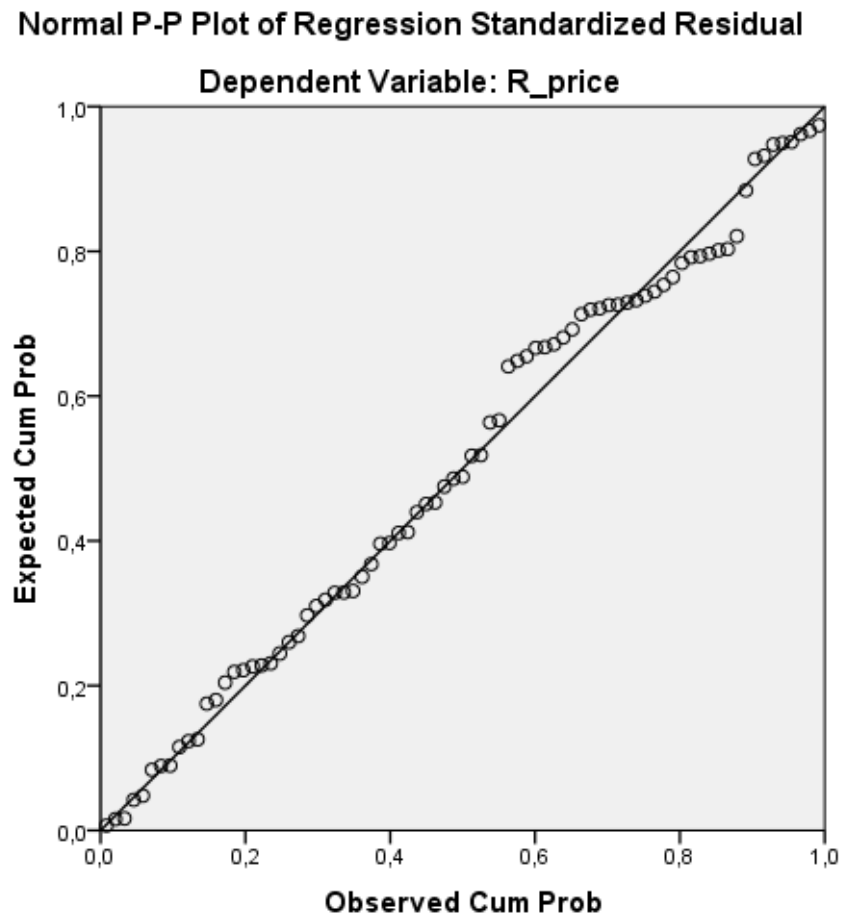
Figure 8. P-P plot for the untrimmed reservation price sample

The P-P plot demonstrates that the data should be transformed in order to fit the normality assumptions. In order to achieve a normal distribution of the residuals, the sample was trimmed to exclude severe outliers, which in its turn normalized the distribution of the residuals:

Figure 9. Boxplots for untrimmed (left) and trimmed (right) reservation price sample

Figure 10.P-P plots for untrimmed (left) and trimmed (right) reservation price sample
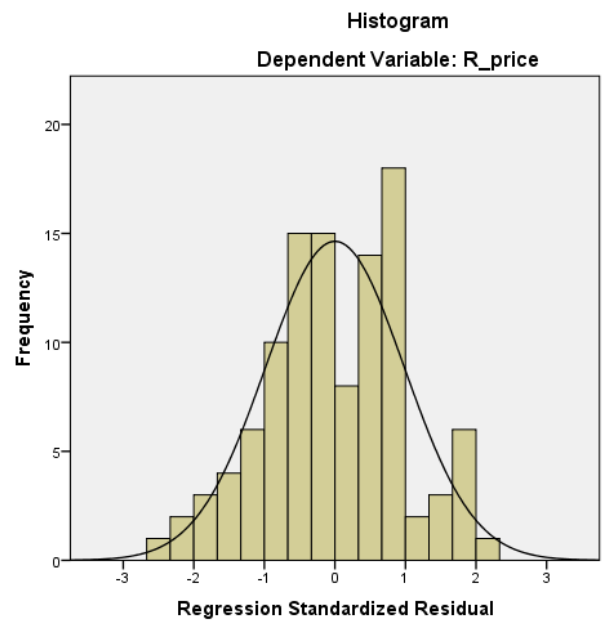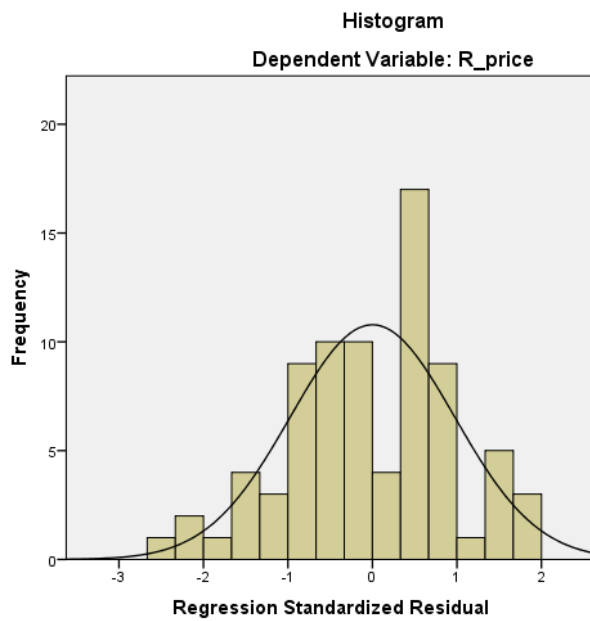
Figure 11. Residuals distributions for untrimmed (left) and trimmed (right) reservation price sample

Now that the model satisfies the necessary assumptions, the input of the sample with transformed dependent variable into the model yielded the following result:

Model Summary[g]

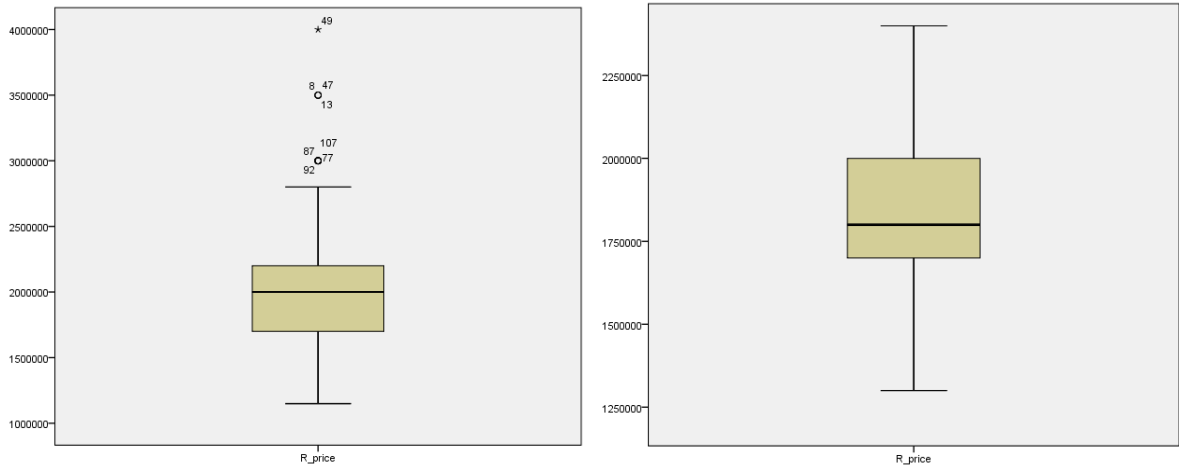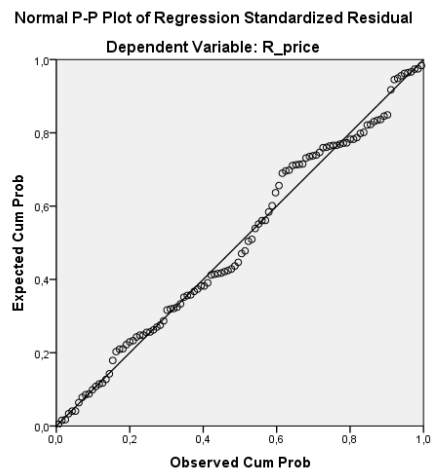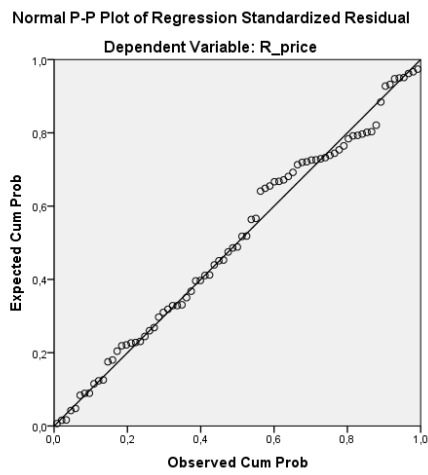| Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	df1	df2	Sig. F Change
1	,313[a]	,098	,032	216164,404	,098	7	96	,180
2	,313[b]	,098	,042	215047,450	,000	1	96	,990
3	,312[c]	,097	,051	214052,295	-,001	1	97	,758
4	,300[d]	,090	,053	213830,216	-,007	1	98	,375
5	,280[e]	,079	,051	214076,381	-,011	1	99	,270
6	,231[f]	,054	,035	215881,910	-,025	1	100	,103

a. Predictors: (Constant), Fm_size, Gender, Financ, Educ, Auto, Occup, Age

b. Predictors: (Constant), Fm_size, Gender, Educ, Auto, Occup, Age

c. Predictors: (Constant), Fm_size, Gender, Auto, Occup, Age

d. Predictors: (Constant), Fm_size, Auto, Occup, Age

e. Predictors: (Constant), Auto, Occup, Age

f. Predictors: (Constant), Occup, Age

g. Dependent Variable: R_price

Table 6. Summary for the regression models with the variables entered using backward method.

The summary table reveals that the adjusted R square, which demonstrates the explanatory power of the regression model adjusted for multiple elements, is highest in models 4 (family size, car possession, occupation and age as predictors = 0.053) and 5 (car possession, occupation and age as predictors = 0.051). As it will be concluded from the table below (Table 7), those models also have the highest significance level of all the models concerned.

ANOVA[a]

Model		df	F	Sig.
1	Regression	7	1,491	,180[b]
	Residual	96		
	Total	103		
2	Regression	6	1,757	,116[c]
	Residual	97		
	Total	103		
3	Regression	5	2,109	,071[d]
	Residual	98		
	Total	103		
4	Regression	4	2,443	,052[e]
	Residual	99		
	Total	103		
5	Regression	3	2,840	,042[f]
	Residual	100		
	Total	103		
6	Regression	2	2,857	,062[g]
	Residual	101		
	Total	103		

a. Dependent Variable: R_price

b. Predictors: (Constant), Fm_size, Gender, Financ, Educ, Auto, Occup, Age

c. Predictors: (Constant), Fm_size, Gender, Educ, Auto, Occup, Age

d. Predictors: (Constant), Fm_size, Gender, Auto, Occup, Age

e. Predictors: (Constant), Fm_size, Auto, Occup, Age

f. Predictors: (Constant), Auto, Occup, Age

g. Predictors: (Constant), Occup, Age

Table 7. F-statistics values and their significance for the models

As it can be noticed, only models 4 and 5 are worth considering since they have significant and close to significant F-values at 95% significance level. Next, it is important to observe the coefficients and their significance in the mentioned models to understand the influence of the outlined characteristics of a customer on the reservation price. The further table will discuss the particualrs of both of the models considered:

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
2	(Constant)	1647614,244	119179,538		13,825	,000	1411075,851	1884152,638
	Gender	-42537,278	47833,871	-,096	-,889	,376	-137474,270	52399,715
	Age	4841,155	1908,470	,297	2,537	,013	1053,370	8628,939
	Educ	-7217,180	23404,776	-,032	-,308	,758	-53669,182	39234,821
	Auto	50666,453	33758,397	,153	1,501	,137	-16334,620	117667,526
	Occup	-43458,389	19990,912	-,237	-2,174	,032	-83134,815	-3781,963
	Fm_size	24125,063	20906,339	,118	1,154	,251	-17368,231	65618,358
3	(Constant)	1627581,121	99453,552		16,365	,000	1430218,783	1824943,459
	Gender	-42443,272	47611,548	-,096	-,891	,375	-136926,839	52040,294
	Age	4899,839	1890,170	,301	2,592	,011	1148,858	8650,820
	Auto	50938,778	33590,676	,154	1,516	,133	-15720,826	117598,382
	Occup	-41549,858	18920,720	-,227	-2,196	,030	-79097,412	-4002,305
	Fm_size	23023,694	20503,662	,113	1,123	,264	-17665,157	63712,544
4	(Constant)	1634638,623	99035,089		16,506	,000	1438131,521	1831145,725
	Age	4253,277	1743,667	,261	2,439	,016	793,464	7713,090
	Auto	49844,326	33533,405	,151	1,486	,140	-16693,225	116381,877
	Occup	-43798,709	18732,336	-,239	-2,338	,021	-80967,729	-6629,690
	Fm_size	22716,329	20479,494	,111	1,109	,270	-17919,429	63352,088
5	(Constant)	1696262,618	82079,018		20,666	,000	1533420,183	1859105,052
	Age	3859,375	1709,088	,237	2,258	,026	468,594	7250,157
	Auto	54785,412	33274,482	,165	1,646	,103	-11230,213	120801,036
	Occup	-40353,677	18494,339	-,220	-2,182	,031	-77045,918	-3661,436
6	(Constant)	1774724,298	67391,869		26,334	,000	1641036,958	1908411,638
	Age	3028,177	1646,597	,186	1,839	,069	-238,229	6294,583
	Occup	-36829,802	18525,014	-,201	-1,988	,050	-73578,447	-81,157

Table 8. Coefficients, t-values and coefficients' significance for the 5 models concerned

As it can be seen from Table 8 above, both in the models 4 and 5 only the coefficients of age (*age)* and occupation of the customer (*occup)* are significant (0.016 and 0.021 respectively in the model 4). At the same time, it is possible to outline that the signs for those two variables are constant throught all 6 models. The coefficients of age and occupation are 0.261 and -0.231 respectively, which supposes the following relationship: the higher the age of the customer, the higher is her reservation price; the higher the education of the customer (the highest level of education obtained), the lower is their reservation price.

Entering other variables in the model did not prdocued significant t-values for the coefficients, meaning that they can not be included in the model at the current (95%) level of confidence.

Finally, on the basis of the above mentioned findings, the model can be finalized as follows:

Model 5 Summary

Variable	Coefficient	Coefficient t-Statistics	Significance
Age	0.237	2,258	0.026
Auto	0.165	1,646	0.103
Occup	-0.220	-2,182	0.031
F-statistic = 2,840			
Significance = 0.042			
$R^2 = 0.280$			
Adjusted R^2 = 0.051			

Table 9. The summarized description of Model 5 at 95% significance level

Discussion of the findings, limitations and further research

Discussion of the findings

The following table summarizes the findings of the analyses, during which the hypotheses stated were tested:

Hypotheses testing results

Group	Hypothesis	Outcome
I	Statistically significant difference between reservation and actual prices	H_0 rejected
II	The age of the customer significantly predicts the reservation price	H_0 rejected
	The size of the family to be dwelling in the apartment significantly predicts the reservation price	H_0 confirmed
	The occupation of the customer significantly predicts the reservation price	H_0 rejected
	The possession of a car significantly predicts the reservation price	H_0 confirmed

Table 10. The summary of the hypothesis testing

It is evident that the first group of hypotheses was proven true, as the results show that the customers indeed have higher reservation prices compared to the prices at which they closed their deals. On the basis of this data demonstrated from the statistical tests, the following assumptions can be made:

- Customers do indeed have higher reservation prices compared to the actual prices provided by OJSC "Normann";
- Due to hypothetical bias, the customers non-deliberately distort their actual reservation prices, since they are not required to purchase the apartment at their self-stated reservation prices.

Since the willingness-to-pay (the question about the reservation price) was self-stated by the customers, it could have actually lead to the distortion of the responds, thus a different method of inquiring the willingness-to-pay could have been employed to produce more reliable results. On the other hand, it can also be argued that since OJSC "Normann" pursues the lowest-possible-price strategy, the company manages to attract the customers by low prices, it leads to the fact the customer pay significantly lower actual price compared to their reservation prices.

As for the second group of hypotheses, it can be concluded that for some of the variables no statistically significant relationship between the outlined observable and unobservable characteristics and the stated reservation prices has been yielded from the sample. The following inferences can be made:

- There is indeed no correlation between those characteristics of a consumer and their reservation prices, as the reservation price is only influenced by the hedonic characteristics of an apartment;
- The correlation could not be established due to the non-deliberate distortion of the self-stated reservation prices;
- The list of the observable and non-observable characteristics is not exhaustive enough and have not covered the characteristics which could have been deemed significant for the reservation prices;
- The customers deliberately distorted the information concerning the characteristics included into the regression model.

Since the study has been mostly conducted in exploratory manner, a more extensive collaboration with the representatives of construction companies could have resulted in a more exhaustive list of the characteristics to be included in the model in accordance with the companies' empirical observations.

As for the established relationship, it can be purported that the relationship between age and occupation can be explained as follows:

- Age – the higher the age of the customer, the higher is the reservation price. With age people have more savings, which means that they are more willing to spend little more money.
- Occupation – the higher the occupation of the customer the less he is willing to spare more money on the deal of purchasing a real estate apartment. This can be explained by the fact that with higher occupation people tend to have higher education (partially proven by the negative coefficient of the corresponding variable (*educ)* in Model 2) or have higher experience in deal closure, which limits the manager on conducting price discrimination.

Limitations

Since the current study has been done in the scope of a master thesis, several assumptions were made in order to fit the scope of the current study format. Those assumptions, combined

with objective shortcomings, in their turn produced a number of limitations under which the current study should be regarded.

Data availability limitations imply that under the scope of the study it was possible to obtain data about customers and the purchases only from single construction company operating on the market of Saint Petersburg. On top of that, the company positions itself as aiming at low-cost apartments, which also bears certain limitation concerning the degree of representativeness of the sample used. Hence, it can be argued whether the findings can be applied on the rest of the market, whether other Saint Petersburg dwellings or other cities' markets are considered.

Simplification limitations are mostly concerned with the assumption made in the outset of the empirical part of this study. The assumption that all of the apartments sold in each of the bucket are similar to a significant degree may have led to the distortion in reservation prices, since, in fact, it is hardly possible to hold all the variables concerned with the hedonic prices for the apartment. Even in the same block of flats the apartments differ by the floor, not to mention the layout of the apartments, which inevitably influences the hedonic price for the apartment for the customer. Additionally, currently the Russian real estate market is going through a crisis, whereas it was tacitly implied that market conditions do not influence the reservation prices.

Surveying limitations are concerned with the fact that the most suitable methods (according to Jedidi and Jagpal, 2009) of inquiring the willingness-to-pay for the apartments could not be used under the scope of the master thesis research, since it would require extensive collaboration with data providers (construction firms) in developing proper survey sets (in case of conjoint analysis) or providing incentives to customers to complete surveys with significantly higher number of question iterations (in case of contingent valuation). Hence, the study has encountered several issues, such as *hypothetical bias* (which implies that since the customers were not obliged to buy the apartment at the stated reservation price, they could safely inflate the actual reservation price) and *non-incentive bias* (meaning that the customers were not given any motivation to disclose their actual reservation price and could actually distort it to make it seem lower than actual, even though the deal was closed).

Further research

It can be stated that there is still a room for further research in the scope outside master thesis format, which could drastically increase the existing study and produce new reliable findings. The further research is to be first of all aimed at eliminating the above mentioned limitations, which can be done in several ways.

Data availability limitations can be eliminated by providing the incentives for other companies, operating in different markets in Russia and worldwide for sharing the information on the purchases and client surveying.

It is also possible to overcome the simplification limitations by including more information about the apartments in the research. According to the amount of the information on the apartment provided by construction companies, it will be possible to further subsegment the buckets of apartments in order to make the comparison between fairly similar apartments. Moreover, a Rosen hedonic prices model can be applied to estimate the hedonic prices part of the customer reservation price slope to increase the level of the confidence in holding those variables constant.

Surveying limitations can be abolished by collaborating with construction companies on negotiating of providing incentives to the customers to complete more sophisticated surveys, which require more effort and time both from the interviewer and interviewee sides. It can be suggested that the construction companies are also interested in collecting more information about their customers in order to be able to upsell them various services, such as decoration services, et cetera.

On top of that, the range of observable and unobservable characteristics can also be augmented by those not covered in this study. For instance, the questions about religious views and political preferences may very well produce interesting results, which can afterwards be used by managers in a relatively applicable manner.

Furthermore, it is also possible to explore other possibilities of price discrimination in accordance with the taxonomy proposed by Storchevoy et al (2016). As the current study was mostly concerned with price discrimination *based on visible characteristics*, those could be merely mediators for other factors which could result in successful *self-selection* price discrimination. For instance, it could be established that people of certain occupation (e.g., artists) prefer apartments with decoration that allows for more open space (e.g., studio apartments). The exploration of such mediation effects will still leave much room for real estate managers to perform successful price discrimination.

CONCLUSION

The study has produced two major findings:

1. There is a significant negative difference between the actual price paid for an apartment and the reservation price
2. There is a significant correlation between the customer occupation, their age and the reservation price for their apartment.

The study was subject to a number of limitations, which could have severely affected the reliability of the research. Elimination of those could produce more reliable results and lead to new valuable conclusions.

As a result, the viability of conducting price discrimination in real estate markets in Russia is proven feasible. However, according to the results of the current study, only a limited number of characteristics was indetified on the basis of which the discrimination by segmentation of the customer could be done. Thus, further research is required in order to develop further recommendations on the practical ways of conducting price discrimination and expanding the range of characteristics for conducting price discrimination.

Scientific contribution

As it has been mentioned before, so far almost no studies were published investigating the issue of the role of customer characteristics in forming of their reservation price for real estate objects, namely low-cost residential dwellings in blocks of flats. Consequently, the following work could very well be one of the first attempts to estimate the influence of observable and non-observable characteristics of a customer on their willingness-to-pay for a particular apartment.

However, as it has been already outlined, the current study has failed to discover any significant relations between particular observable and non-observable characteristics and reservation prices due to a significant number of limitations. Nevertheless, the study has founded a basis for further research and outlined the challenges and limitation which must be overcame in further research to establish sound scientific conclusions about the absence of any relationship between reservation prices and customer characteristics.

Furthermore, the study is an attempt to augment the existing Rosen model of the hedonic prices for real estate objects. In case the further research is successful to establish the relationship between WTP and customer characteristics, this could be a significant contribution

to the existing theory of hedonic prices. Furthermore, the research opens possibilities for studying a larger range of factors which could possibly influence the reservation price for a particular real estate objects, including hedonic characteristics and customer characteristics.

Moreover, the concepts mentioned in this study (the new price discrimination taxonomy by Storchevoy et al (2016), the taxonomy of methods of WTP measurement by Jedidi and Zhang (2002) were used not to a full extent and can be further developed in consequent studies on this topic of real estate.

Practical contribution

As it was discovered, the managers of real estate can take into consideration the age and the occupation of the consumer to accordingly decide on employing the techniques of price discrimination, being aware of the possible effects of these two variables on the reservation price of their customers, thus increasing the margins of their business.

In case the further research is done and some significant correlation is discovered between other characteristics of a customer and their reservation price, this possibility could provide new ways for the managers of construction companies to increase the profit margins of their companies by extracting more consumer surplus due to successful application of price discrimination.

On the other hand, when it comes to the non-observable characteristics, a straightforward question asked by a manager in order to reveal them might trigger a protective psychological mechanism in a customer, which in its turn could lead to deliberate distortion of the answers and thus will obstruct the manager from performing the price discrimination. However, if a significant correlation between a non-observable characteristic and its influence on the customer's reservation price is established, managers can come up with "proxy" questions to reveal the values of non-observable characteristics of a customer. For instance, in order to evaluate the income (which is regarded as an unobservable characteristic) of a customer, the manager in the course of the first interaction (vis-à-vis, via telephone, etc.) can ask the customer about his past travel experiences, obliquely inquiring about the frequency of travelling of this particular customer. Therefore, an inference about possible income can be obtained, given that there is a positive correlation between the frequency of travelling and customer's income. Furthermore, it is possible to come up with more "proxies" to learn about sensitive non-observable characteristics of a customer for managers to use.

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Appendix 1. The survey conducted by OJSC "Normann"

Опрос на тему:	«Изучение Клиентов Normann»
ID / номер анкеты /	
ИНТЕРВЬЮЕР / ИМЯ, ФАМИЛИЯ /	
НОМЕР КЛИЕНТА / У АДМ. СЛУЖБЫ СЕРВИСА /	
ДАТА	Число Месяц Год / / 2014 г.

ОПРОСНЫЙ ЛИСТ

Здравствуйте, меня зовут _____. **Компания NORMANN** проводит исследование среди дольщиков своих объектов с целью повышения качества продукции и улучшения сервиса. Мы просим Вас ответить на несколько вопросов, это не отнимет у Вас много времени. Все данные, полученные в ходе исследования, будут использоваться только в обобщенном виде.

Q1. КАКУЮ КВАРТИРУ ВЫ ПРИОБРЕЛИ?

1). Студию   **2).** 1-к. квартиру   **3).** 2-к. квартиру   **4)** 3-к. квартиру

Q2. УКАЖИТЕ, ПОЖАЛУЙСТА, ПРЕДЛОЖЕНИЯ КАКИХ ЗАСТРОЙЩИКОВ ВЫ РАССМАТРИВАЛИ ДЛЯ ПРИОБРЕТЕНИИ КВАРТИРЫ (НЕ МЕНЕЕ 3-Х)? (ПО ВОЗМОЖНОСТИ, ПРОСИМ УКАЗАТЬ НАЗВАНИЕ ОБЪЕКТОВ И КРАТКО ПРИЧИНУ, ИЗ-ЗА КОТОРОЙ ВЫ ОТКАЗАЛИСЬ СДЕЛКИ). /ОТКРЫТЫЙ ВОПРОС/

	Застройщик		Объект		Причина отказа
2.z1		2.o1		2.p1	
2.z2		2.o2		2.p2	
2.z3		2.o3		2.p3	
2.z4		2.o4		2.p4	

Q3. СКАЖИТЕ, ПОЖАЛУЙСТА, ПРИ ПОКУПКЕ КВАРТИРЫ КАКАЯ ЦЕНА ЗА КВ. МЕТР ПОКАЗАЛАСЬ БЫ ВАМ?

/ЗАЧИТАТЬ!/ ВНИМАНИЕ! НЕОБХОДИМО ВПИСАТЬ КОНКРЕТНУЮ СУММУ В РУБЛЯХ!

№		рубли
1).	Слишком высокой, Вы бы не купили квартиру у любого застройщика	
2).	Слишком низкой, Вы начали бы сомневаться в качестве квартиры, надежности застройщика	
3).	Достаточно высокой, чтобы сменить застройщика	

Q4. СКАЖИТЕ, ПОЖАЛУЙСТА, ПРИ ПОКУПКЕ КВАРТИРЫ КАКАЯ ЦЕНА ЗА КВАРТИРУ ПОКАЗАЛАСЬ БЫ ВАМ?

№		рубли
1).	Слишком высокой, Вы бы не купили квартиру у любого застройщика	
2).	Слишком низкой, Вы начали бы сомневаться в качестве квартиры, надежности застройщика	
3).	Достаточно высокой, чтобы сменить застройщика	
4).	Достаточно высокой, чтобы сменить застройщика, если предположить, что вы приобретаете квартиру с полной чистовой отделкой	

Q5. ПОЖАЛУЙСТА, ПРОРАНЖИРУЙТЕ ПРЕДЛОЖЕННЫЕ ФАКТОРЫ, В ПОРЯДКЕ УБЫВАНИЯ ИХ ВАЖНОСТИ ДЛЯ ВАС. «1» СООТВЕТСТВУЕТ НАИБОЛЬШЕЙ ВАЖНОСТИ, «8» - НАИМЕНЬШЕЙ / ЗАЧИТАТЬ И РЯДОМ ПОДПИСАТЬ СООТВЕТСТВУЮЩИЕ ЦИФРЫ!/

1).	Цена
2).	Репутация застройщика
3).	Расстояние до метро
4).	Расстояние до центра
5).	Инфраструктура (расположение поблизости магазинов, банкоматов, аптек, и т.д.)
6).	Социальная инфраструктура (расположение по близости детских садов, школ)
7).	Расстояние до места работы
8).	Экология

Q6. ВЫ ПРИОБРЕЛИ ЖИЛЬЕ, ВОСПОЛЬЗОВАВШИСЬ КАКОЙ-ЛИБО АКЦИЕЙ (СПЕЦИАЛЬНЫМИ УСЛОВИЯМИ) КОМПАНИИ? КАКИМИ?

ЕСЛИ «НЕТ»   ➔ Q.7.
ЕСЛИ «ДА»   ➔ Q.6.

Q7. ЕСЛИ БЫ АКЦИИ (СПЕЦИАЛЬНОГО УСЛОВИЯ) НЕ БЫЛО, КАК БЫ ИЗМЕНИЛСЯ ВАШ ВЫБОР? ЗАКРЫТЫЙ ВОПРОС

1).	Все равно купили бы данную квартиру сейчас
2).	Все равно купили бы данную квартиру позже

3).	Купили бы квартиру у другого застройщика

Q8. НА КАКОМ ВИДЕ ТРАНСПОРТА ВЫ ЧАЩЕ ВСЕГО ПЕРЕДВИГАЕТЕСЬ ПО ГОРОДУ (ПРОРАНЖИРУЙТЕ, ЕСЛИ НЕСКОЛЬКО)? / ЗАЧИТАТЬ /

1).	Личный автомобиль	4).	Коммерческие маршрутки
2).	Метро	5).	Велосипед
3).	Наземный общественный транспорт	6).	Другое (что именно?)

Q9. УКАЖИТЕ ОСНОВНЫЕ ПУНКТЫ ВАШИХ ПЕРЕМЕЩЕНИЙ В ТЕЧЕНИЕ ОБЫЧНОГО РАБОЧЕГО ДНЯ (ПРОРАНЖИРУЙТЕ, ЕСЛИ НЕСКОЛЬКО) / ЗАЧИТАТЬ /

1).	Работа	4).	Заведение культуры, спорта, досуга
2).	Место учёбы ребёнка	5).	Магазин, торговый центр
3).	Медицинское учреждение	6).	Другое (что именно?)

Q10. СКОЛЬКО ВРЕМЕНИ ВЫ ТРАТИЛИ НА ДОРОГУ ДО НАИБОЛЕЕ ВАЖНЫХ ПУНКТОВ С ПРОШЛОГО МЕСТА ЖИТЕЛЬСТВА, И СКОЛЬКО БУДЕТЕ ЗАТРАЧИВАТЬ С НОВОГО? / ЗАКРЫТЫЙ ВОПРОС /

Q.9_1	Старое место жительства	1	до 20 мин.	2	20-40 мин.	3	41 мин. -1,5 час	4	от 1,5 ч. до 2,5 ч.	5	более 2,5 ч.
Q.9_2	Новое место жительства	1	до 20 мин.	2	20-40 мин.	3	41 мин. -1,5 час	4	от 1,5 ч. до 2,5 ч.	5	более 2,5 ч.

Q11. КАКУЮ ПО ВРЕМЕНИ ПОЕЗДКУ ВЫ СЧИТАЕТЕ НЕДОЛГОЙ, А КАКУЮ КРИТИЧЕСКОЙ (ОЧЕНЬ ДОЛГОЙ)
/ ОТКРЫТЫЙ ВОПРОС

1).	недолгая	2).	критическая

Q12. ЗА КАКУЮ СКИДКУ ОТ ИТОГОВОЙ СТОИМОСТИ ВАШЕЙ КВАРТИРЫ ВЫ БЫЛИ БЫ ГОТОВЫ ОБМЕНЯТЬ ЕЕ НА ТАКУЮ ЖЕ КВАРТИРУ, НО НА ПЕРВОМ ЭТАЖЕ? НА ПОСЛЕДНЕМ? СУММА В РУБЛЯХ.

Q13. ВЫ ПРИОБРЕЛИ КВАРТИРУ В КОМПАНИИ «NORMANN» ДЛЯ: /ЗАЧИТАТЬ/

1). Жилья   ➔Q.11
2). В качестве инвестиционного вложения ➔Q.10
3). Другое (уточнить): _____

Q14. ВЫ ПЛАНИРУЕТЕ В ДАЛЬНЕЙШЕМ / ЗАЧИТАТЬ /

1). Перепродать   ➔Q.12
2). Сдавать в аренду   ➔Q.12

Q15. ВЫ ПРИОБРЕЛИ КВАРТИРУ ВСЛЕДСТВИЕ? / ЗАЧИТАТЬ /

1).	Рождения ребёнка	5).	Распада семьи (развода)
2).	Переезда из другого города	6).	Создания новой семьи
3).	Переезда из другой страны	7).	Приобрели жилье для детей/родителей
4).	Желания улучшить жилищные условия	8).	Другое (что именно?)

Q16. КАКОВЫ БЫЛИ ВАШИ ЖИЛИЩНЫЕ УСЛОВИЯ ДО ПРИОБРЕТЕНИЯ КВАРТИРЫ В «NORMANN»? / ЗАЧИТАТЬ /

1).	Квартира родителей (родственников)	5).	Комната в коммунальной квартире
2).	Собственная квартира	6).	Другое (что именно?)
3).	Съемная квартира		
4).	Общежитие		

Q17. ДЛЯ ПРИОБРЕТЕНИЯ ЖИЛЬЯ В КОМПАНИИ «NORMANN» ВЫ? /ЗАЧИТАТЬ! ВОЗМОЖНО НЕСКОЛЬКО ВАРИАНТОВ ОТВЕТА /
1). Продавали имеющуюся недвижимость ➔ Q.17
2). Брали ипотечный кредит ➔ Q.18
3). Брали потребительский кредит ➔ Q.18
4). Пользовались рассрочкой строительной компании➔ Q.18
5). Использовали накопления ➔ Q.18
6). Помощь родственников и друзей ➔ Q.18

Q18. КАКУЮ ДОЛЮ СОСТАВИЛА СУММА ОТ ПРОДАЖИ ВАШЕЙ НЕДВИЖИМОСТИ В ПОКУПКЕ НОВОЙ. ПОЖАЛУЙСТА, УКАЖИТЕ ПРИМЕРНЫЙ ПРОЦЕНТ. ЕСЛИ СУММА ПРОДАЖИ ПРЕВОСХОДИТ СУММУ ПОКУПКИ, НАПИШИТЕ - 100%

1)._____/ЗАПИШИТЕ /

Q19. КТО ИГРАЛ В СЕМЬЕ ОСНОВНУЮ РОЛЬ В ВЫБОРЕ ВАРИАНТА?

1). _____/ЗАПИШИТЕ /

И В ЗАКЛЮЧЕНИЕ НЕСКОЛЬКО ВОПРОСОВ О ВАС ЛИЧНО

Q20. СКОЛЬКО ЧЛЕНОВ В ВАШЕЙ СЕМЬЕ, КОТОРЫЕ ОБЪЕДИНЕНЫ ОБЩИМ БЮДЖЕТОМ

1). Один 2). Два 3). Три 4). Четыре 5). Пять и более

Q21. КАК ВЫ СЧИТАЕТЕ, К КАКОЙ ГРУППЕ ВЫ МОГЛИ БЫ ОТНЕСТИ СВОЮ СЕМЬЮ? / ПОСЛЕ ОТВЕТА СООТНЕСТИ СО ЗНАЧЕНИЕМ ИЗ ВТОРОГО СТОЛБЦА, ЗАДАВ УТОЧНЯЮЩИЙ ВОПРОС/

Q21.	Группа населения	**Q21.1.**	Укажите совокупный доход Ваш семьи (в месяц)
1).	Денег хватает только на продукты питания и одежду	1).	От 15 001 до 25 000 руб.
2).	Можем позволить себе приобретение товаров длительного пользования (телевизор, холодильник и т.п.)	2).	От 25 001 до 40 000 руб.
3).	Можем позволить себе приобрести новый отечественный автомобиль	3).	От 40 001 до 60 000 руб.
4).	Можем позволить себе приобрести новый импортный автомобиль среднего класса	4).	От 60 001 до 80 000 руб.
5).	Можем позволить себе приобрести однокомнатную квартиру	5).	От 80 001 до 100 000 руб.
6).	Ни в чем себе не отказываем	6).	Более 100 000 руб.
7).	Отказ отвечать	7).	Отказ отвечать

Q22. ПОЛ РЕСПОНДЕНТА: 1). Мужской 2). Женский

Q23. ВАШ ВОЗРАСТ: _____ (полных лет)

Q24. ВАШЕ ОБРАЗОВАНИЕ:

1).	Среднее	4).	Высшее
2).	Среднее специальное	5).	Два высших образования
3).	Незаконченное высшее	6).	Ученая степень, научное звание

Q25. ВАША ДОЛЖНОСТЬ: _____

(НАПР.: ДИРЕКТОР, СЕКРЕТАРЬ, БУХГАЛТЕР, СВАРЩИК, МАЛЯР)

Q26. ИМЕЕТ ЛИ ВАША СЕМЬЯ В СВОЕМ РАСПОРЯЖЕНИИ АВТОМОБИЛЬ? ЕСЛИ ДА, ТО СКОЛЬКО

1).	Нет	3).	2
2).	1	4).	3

Q27. УКАЖИТЕ ВОЗРАСТ И КОЛИЧЕСТВО ЧЛЕНОВ СЕМЬИ, КОТОРЫЕ БУДУТ ПРОЖИВАТЬ В НОВОМ ЖИЛЬЕ? / ЗАПИСАТЬ ЦИФРУ В НУЖНУЮ ГРАФУ /

	Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во
1).	0-5		5).	21-25		9).	41-45		13).	61-65		17).	81-85	
2).	6-10		6).	26-30		10).	46-50		14).	66-70		18).	86-90	
3).	11-15		7).	31-35		11).	51-55		15).	71-75		19).	91-95	
4).	16-20		8).	36-40		12).	56-60		16).	76-80		20).	96-100	

Q28. УКАЖИТЕ ВОЗРАСТ И КОЛИЧЕСТВО ЧЛЕНОВ СЕМЬИ, ПРОЖИВАВШИХ С ВАМИ В ПРОШЛОМ ЖИЛЬЕ? / ЗАПИСАТЬ ЦИФРУ В НУЖНУЮ ГРАФУ /

	Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во		Возраст	Кол-во
1).	0-5		5).	21-25		9).	41-45		13).	61-65		17).	81-85	
2).	6-10		6).	26-30		10).	46-50		14).	66-70		18).	86-90	
3).	11-15		7).	31-35		11).	51-55		15).	71-75		19).	91-95	
4).	16-20		8).	36-40		12).	56-60		16).	76-80		20).	96-100	