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Consumer desired price modeling – case study on the RCBS market

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Abstract

This paper is focused on the information asymmetry problem. When the consumer has a market overview then the optimal product can be chosen more or less easily. We model more realistic situation where the consumer does not have a market overview and so the process of search has to be performed. The harder the search is the higher information asymmetry is. The aim of the paper is to find if the information asymmetry prevents the consumer to find optimal product and if yes then to model what price rational consumer will choose. For this purpose we reworked Stigler’s model into the model more suitable for the small market needs. We used this model on the retail core banking services to individuals in the Czech Republic. On this market the information asymmetry was found within the European Union research as well as within our own research. We find that information asymmetry prevents even low search cost user the optimal price choice, we are abstracting from the influence of scattered knowledge, advertisement etc. However for more than half of the products on this market it is rational to search for the better price and so to generate positive savings. Also we state that information asymmetry is mostly caused by variable costs on search that express the task of a final price determination.

Keywords: retail core banking services; small market model; information asymmetry; search;

1. Introduction

Information asymmetry is a situation where one side of the market benefits from the information advantage at the expense of the second one. This situation does not necessarily mean the market disequilibrium. We can imply the F. A. Hayek’s thoughts (Hayek, 1958) and say that equilibrium can be achieved under the different levels of informedness. However the question is the market efficiency of these equilibriums, to be more specific who will gain the portion of other side’s surplus. Who carries the negative impact of the information asymmetry? We model the situation where the demand side, the consumers bear the impact of information asymmetry. This fact proves also the results of the numerous studies made or made for the European Union such as (DGHCP, 2009), (DGIMS, 2010) or (EC, 2009). One of the many issues that falls within this topic is asymmetric information on price. When the consumer has a market overview then the optimal product can be chosen more or less easily. Let us abstract from the influence of scattered knowledge, advertisement etc. and presume that the consumer has to perform the search to determine the price and that demanded goods are almost homogenous. As (Stigler, 1961) points out, the search is rational only if the marginal savings are greater or equal the marginal costs of search. Let us use the small market

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model on retail core banking services market (thereinafter only as RCSB) to find if the information asymmetry represented by costs on search is high enough to prevent the optimal price choice.

2. The problem and the model

Stigler (Stigler, 1961) is solving the situation where the consumer prefers the lowest price on homogenous product but the prices are yet to be discovered in order to make choice. The consumer tries to find the best price by doing the search – or better the searches. The search is the process of canvassing of one supplier. Applying this idea – Stigler’s approach shifts the consumer’s optimum by adding a new product price if the new one was lower than know minimum so far. There was introduced a way of rational consumer behavior by the balance of marginal costs and marginal returns on information. Marginal costs arise from the search. Marginal returns are gained through difference between the known price(s) and the best found price. The total amount of money, that is gained though identifying better price and so of switching actual product to more preferable one, is total savings variable. That is the problem to be solved. The question is not what product or price is the optimal one as it is usual. The question is the optimal amount of information that leads to the highest total savings.

The two basic extremes can happen. Let us presume e.g. uniform distribution of market prices of suitable products and consumer that uses expensive product. When the consumer’s threshold of acceptable price is high, then the acceptable price can be found more or less fast. But the price does not differ enough from the initial one and so total savings are very low or negative. On the other hand let us presume consumer with very low threshold of acceptable price. Low price differs from the initial one but the costs of the search for the very low price are high. Again the total savings are very low or negative.

However Stigler’s paper was a breakthrough in microeconomics, his model was not suitable for direct application. That is why we reworked original model to more suitable one. We presume normal distribution of the market prices unlike the uniform one used by Stigler. Stigler proposes to compute the optimal number of searches to be performed. We propose to compute the optimal price to be searched for. By term optimal price it is meant price that is optimal by search costs to search revenue, in other words total savings, and by the quality and quantity demanded (concerning the RCSB we mean range and frequency of the demanded services). The optimal price on the market will be probably different from the optimal price computed by the model because model optimal price counts in the costs on search and the probabilistic problem of search. For closer theoretical description of performed rework of the Stigler’s model please see (Hedvicakova, Soukal, & Draessler, 2012).

3. Market data

For the case study the appropriate data source is needed. To determine the supply there has to be set the model consumer has to be determined. We used the database of RCSB calculator project (thereinafter only as Calculator). The Calculator is a free tool for easy product RCSB offer comparison. Consumer just inputs his or hers individual usage of RCSB and the system advise the best 15 products, that offers all demanded services for best price. Calculator’s database holds the tariff data of almost 98 % share of the RCSB market in the Czech Republic, to be more specific it contains data on 45 current accounts offered. For more information about this project please see. We used data from Calculator as a source for a cluster analysis to identify the average bank client using e-banking profile (Soukal & Hedvicakova, 2010). Then we used Calculator to export the pricing of our computed consumer. 33 accounts offering demanded services were found. Still only 28 accounts can be described as inclusive, 1 account has debatable inclusivity and the rest is certainly exclusive. The exclusivity rule was set by charge policy when high amount of money (more than 20 000 €) has to be deposited or invested in the bank in order to get an account management free of charges. Even though only inclusive accounts were chosen, the price varies greatly from almost zero month fee to 10,2 €.

Although the model usage profile was successfully computed and determined the costs of the search is more complex task since there are no empirical data available. The alternative approach was chosen and instead of average consumer costs on search, the lower bound was searched for. There was chosen the consumer with
predisposition of very low costs on search. The reason is to research the situation for lower bound of search costs and state that for the rest of the population the situation is likely worse. Mentioned predispositions of very low costs on search were high IQ, high ICT uses literacy, above average knowledge of banking terminology. The next presumption concerns the time value. Let us presume that time can be substituted by work and vice versa. Then the time unit value can be derived from the average or median wage. The net median wage was used and it set the cost of one minute at 0.0769 €. To measure the savings there has to be set an actual price. There was chosen the modus that is also the median of 5,16 € from the RCBS prices. The last variable that has to be determined before the computation is the price structure stability. It very hard to determined pricing policy structure stability because of the lack the data however there can be used expert guess. We asked P. Nacher that is the owner of the company providing the Calculator and other public beneficial financial literacy services. He claims that maximum period without any fundamental change in tariffs is 1,5 year for the last 5 years. However the last year was very dynamic at pricing changes and so it is safer to presume 1 only. Because it cannot be determined when exactly the search is performed (at the beginning or at the end of stability period) 6 moths was set as the time period of price structure stability.

The first task of time costs determination simulation was to identify own usage profile. From previous cooperation it was known that our test subject was in average bank client e-banking activated cluster but there was needed the simulation of common consumer. The first task of the pre-search phase was usage profile determination from the last statements and creation of the table with the demanded services and usage frequencies (the turnover, average balance and card services demand was regarded too). The second task of this phase was the supply identification. Test subject used Google and searched total time noted. The costs of this phase were 2,61 €.

The second phase (the search) was conducted by random choice of found accounts. When account was selected the tariff was found, fees for demanded services noted and the final price computed. This task is much easier for the accounts with tariff base policy. The longest computation is needed for the bundle or package products. There have to be computed at least two or three alternates before the best one could be chosen. The average costs of search (the costs of canvassing one product and its price) is then 1,61 €.

4. The price modeling

Using IBM PASW there was performed the normality test. Both normality tests (K-S and S-W test) were passed successfully and so there cannot be rejected the hypothesis that our empirical prices are the choice from the normal distribution. Then all variables were established and the optimal price was computed. The highest savings are gained when the price of 2,38 € is being searched for. Total savings gained, when the optimal price is chosen and the actual product of 5,16 € is switched to the optimal one, are 3,58 €. High influence on the result has time of price structure stability and then the costs of one search see the figures 1 and 2. It is clear that in general the initial price or the price distribution has even greater influence but the paper is focused on the information asymmetry. How hard is to create the information (cost of one search) and how long is this information valid (price structure stability) are the school-book examples of information asymmetry.
On the figure 1 there can be seen that for our model consumer both extremes mentioned earlier hold. In case of search for too low month price there are too high costs on search. On the other hand high prices cannot generate enough of savings even though the search is easy. The test subject’s average search costs were 21 minutes (the bold curve). So the positive savings are generated for price $x \in (0,95;3,94)$. Also there can be seen the optimal price to be searched for of 2,38 €. Hence the median price was used as the actual consumer’s product, then the chart can be interpreted that more than one half of the RCBS offer the search for better price is rational. Still there has to be mentioned that low search costs model subject was studied. As the average costs on search rise from 21 minutes, there can be seen the shift of the optimal price to higher one and so the decrease of total savings.

The second figure shows the influence of the price structure stability in months on total savings. This influence is relatively greater than the one of the average costs on search. Any more month of price structure stability higher the total savings. For the stability of one quarter and less the savings cannot be generated at all and any search is not rational. The process of constructing the adequate market overview is costly but the periodic reconstruction of it is greater problem. Apart from the fact that pricing structure has greater influence the attention should be paid more on the problem of the average search costs. Solving this problem greatly would help to solve the problem of the price structure. We propose ICT solution of pricing database based on actual tariff information and on typical usage patterns. For the raw outline please see (Soukal, Hedvicakova, & Draessler, 2012).

5. Conclusion

The paper was focused on the RCBS market in the Czech Republic. There was used the small market model (reworked Stigler’s model) to describe the influence of the average costs on search and the price structure stability on the total savings. For this task the real market data were used (average consumer with e-banking activated) and low search cost test subject was studied. It was found that it is rational even under the information asymmetry to search for better product on one’s own – without regard to the advertisement. The highest savings are gained when the price of 2,38 € is being searched for. Although the optimal price was computed and so the savings it has to be stated that the results of the average consumer are likely worse. Out finding that half of the products on the market is rational to search for the better and so to replace is the lower bound of the set of the results.

The more complex the product is the narrower is the interval for savings. Foremost there has to mentioned that the complex packages, bundling of RCBS and other financial products such as insurance, loans (consumer loans, credit cards), saving accounts are causing the largest portion of average search costs. Those pricing policies are often used as consumer loyalty policy. However some sources, such as (Gans, 2005) using the term “confusofopoly” or (Zettelmeyer, 1998) with his model, indicates that this behavior is intentional. However the studies of the EU did not shared this conclusion and considers information asymmetry more as the collateral damage of cross-selling and product tying.
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