Expert Journal of Economics. Volume 4, Issue 1, pp. 1-8, 2015
 ISSN 2359-7704
http://Economics.ExpertJournals.com

Law of One Price and Optimal Consumption-Leisure Choice Under Price Dispersion

Sergey MALAKHOV*

Pierre-Mendès-France University, Grenoble, France

In memory of Gulya – my wife, friend, and colleague

If the demand under price dispersion is formed by consumers with zero search costs and consumers with positive search costs, the law of one price holds at the equilibrium price level, where the lowest willingness to pay between consumers with zero search costs meets the willingness to accept or to sell of consumers with positive search costs. Consumers with positive search costs maximize their utility with respect to their optimal decisions when marginal losses in labor income during the search are equal to marginal savings on purchase. Optimal decisions move their willingness to accept to the equilibrium price level. Suboptimal decisions of consumers with positive search costs result in willingness to accept below the lowest willingness to pay of consumers with zero search costs and arbitrage takes place. Arbitrage drops down the equilibrium price to the level where willingness to accept of consumers with positive search costs meets the new lowest willingness to pay of consumers with zero search costs and where purchasing decisions of consumers with positive search costs become optimal.

***Keywords**: propensity to search, propensity to produce at home, consumption-leisure choice, Veblen effect*

***JEL Classification:** D11, D83*

1. Introduction

During last decades the problem of price dispersion has become one of the most intriguing issues of modern economics (Adams (1997), Burdett and Judd (1983), Carlson and McAfee (1983), Diamond (1971, 1987), Fishman (1992), Janssen and Moraga-González (2004), Janssen, Moraga-González, and Wildenbeest (2005), Lach (2002), Manning (1997), Pratt, Wise, and Zeckhauser (1979), Reinsdorf (1994), Rosenthal (1980), Rothschild (1974), Salop and Stiglitz (1977, 1982), Stahl (1989), Stigler (1961), Stiglitz (1979), Varian (1980)). In 1994, J. McMillan and M. Rothschild summarized the growing interest to the question of price dispersion in the "Handbook of Game Theory". In 2006 M.R. Baye, J. Morgan and P. Scholten presented the comprehensive overview of that problem for "Economics and Information Systems" where they introduced that phenomenon with the proposition that empirical studies had revealed the fact that price dispersion was the rule rather than the exception in many homogeneous product markets. In addition, the authors strengthened

* Corresponding Author:
Sergey Malakhov, Ph.D., Applied Economics, Pierre-Mendès-France University, Grenoble, France

Article History:
Received 5 February 2016 | Accepted 19 February 2016 | Available Online 6 March 2016

Cite Reference:
Malakhov, S., 2016. Law of One Price and Optimal Consumption-Leisure Choice Under Price Dispersion. *Expert Journal of Economics,* 4(1), pp.1-8

their opinion by very famous statement: "Economists have belatedly come to recognize that the "law of one price" is no law at all" (Varian 1980, p.651).

The persistence of price dispersion that cannot be eliminated by arbitrage is explained by many economic and institutional factors where the consumers' heterogeneity is one of the most important reasons for stable price differences. Usually analytical approaches to consumers' heterogeneity envisage two groups of consumers. There are consumers that do not search, i.e., price-takers, and there are consumers that search for low price: "Some consumers have zero search costs, while all others have a positive search cost" (Stahl, 1989, p.700). The model of the optimal consumption-leisure choice under price dispersion (Malakhov, 2013, 2014a, 2014b, 2014c, 2015) also uses this dual approach. Examining *shoppers* with zero search costs and *searchers* with positive search costs, the model proposes some additional reasoning to the question whether Walras' law holds or not under price dispersion in homogeneous product markets.

The model of the optimal consumption-leisure choice under price dispersion argues that market transforms everyday satisficing buying decisions into optimal consumption-leisure choices that equalize marginal costs of search with its marginal benefits. The model describes the analytical framework that demonstrates why an explicit satisficing decision becomes optimal. Observing behavior of *searchers*, this paper specifies the role of optimization of search costs in the establishment of the equilibrium price level.

2. Willingness to Pay, Equilibrium Price, and Willingness to Accept

The optimal consumer choice under price dispersion represents the result of the trade-off between consumption and leisure with respect to two constraints – the wage rate w and marginal savings on purchase, i.e., the price reduction with regard to the time of search S at the moment of purchase $\partial P/\partial S<0$. The trade-off between consumption Q and leisure H is provided by the propensity to search $\partial L/\partial S<0$, i.e., the propensity to substitute labor L for search as for another source of income. When the problem of the maximization of consumption-leisure utility $U(Q,H)$ is constrained by the equality of marginal values of search $w\partial L/\partial S=Q\partial P/\partial S$, where the left side of the equation represents the value of marginal loss in labor income during the search and the right side represents the value of marginal benefit of search, the marginal rate of substitution of leisure for consumption takes the following form (1):

$$\frac{\partial U/\partial H}{\partial U/\partial Q}=-\frac{w}{\partial P/\partial S}\partial^2 L/\partial S\partial H \quad (1)$$

The analysis of the propensity to search discovers the time-based structure of this apparently complex psychological variable with respect to the time horizon $T=L+S+H$ of the consumption-leisure choice (Malakhov, 2013, 2015):

$$w\frac{\partial L}{\partial S}=-w\frac{L+S}{T} \quad (2)$$

And the derivative of the propensity to search with respect to leisure time simplifies the presentation of the *MRS(H for Q)*:

$$-\frac{L+S}{T}=\frac{H-T}{T}\Rightarrow\partial^2 L/\partial S\partial H=\frac{1}{T} \quad (3)$$

$$\frac{\partial U/\partial H}{\partial U/\partial Q}=-\frac{w}{T\partial P/\partial S} \quad (4)$$

And we see that this consideration gives us another form of the constraint for the utility maximization problem:

$$w\frac{\partial L}{\partial S}=Q\frac{\partial P}{\partial S}\Rightarrow w(L+S)=-TQ\partial P/\partial S \quad (5)$$

The static maximization problem simply requires the equality of marginal values of search $w\partial L/\partial S=Q\partial P/\partial S$. It tells us that any optimal choice should respect this equality. However, a common consumer choice usually represents the result of some dynamic sequential search for the predetermined quantity Q. The search starts at the reservation level or the willingness to pay wL_0 and goes along the dispersion of prices that produce different marginal savings on purchase $\partial P/\partial S$. And the final decision, for example, the choice of the first quote below the reservation level of labor income $wL<wL_0$, that could be spent and restored by labor after the purchase, represents the choice of the price of purchase $P_P=wL$ for the given quantity Q with corresponding

marginal savings $Q\partial P/\partial S$. If we follow step by step a common purchasing decision, it gives us the following picture (Figure 1):

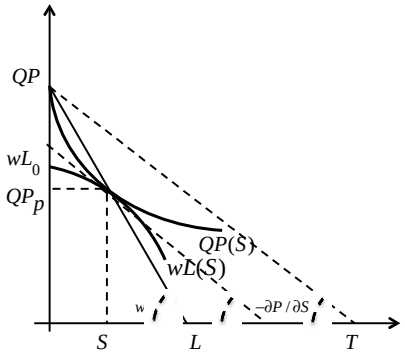

Figure 1. *Satisficing optimal decision*

We see the graphical presentation of consumer decision develops Equations 4 and 5. It gives us some price P at the zero-search-costs level. And this price is greater than the willingness to pay $WTP=wL_0$.

To understand better this hypothetical price let us take home production, say, preparing a meal, as a particular form of search where the purchase price is equal to the price of inputs for home production6 here meal's ingredients, or $QP_p=wL$, and costs of production are equal to their opportunity costs, or to the wS value. The model presented here simplifies the vision of the allocation of time. While it takes into account only labor, leisure, and search, the $\partial L/\partial S<0$ rule takes the search as any form of activity that reduces price of purchase. However this simplification doesn't look methodologically inconsistent because even the detailed analysis of the allocation of time can assume that "the price of time (is) the same for the shopper and for the home producer" (Aguiar and Hurst 2007, p.1536). And that "price of time" here really "does not necessarily equal a market wage (ibid.). Being compared with marginal savings on purchase, or $\mu=Q\partial P/\partial S$, it gives us $\mu=w\partial L/\partial S$. And the value of total costs $w(L+S)$ should give us the price of the prepared meal, or $w(L+S) =QP$. This assumption gives us an understanding that the value of our hypothetical price P at the zero-search-costs level is equal to the ***willingness to accept or to sell*** the prepared meal. The same thing happens when a consumer decides at what price he should sell the item that has been found and bought. If a consumer decides to sell this item he should recover not only labor costs wL but also search costs wS. Hence, the marginal rate of substitution of searcher's consumption to his leisure takes the final form:

$$\frac{\partial U/\partial H}{\partial U/\partial Q}=-\frac{w}{\partial P/\partial S}\partial^2 L/\partial S\partial H=-\frac{w}{T\partial P\partial S}=\frac{w}{P} \quad (6)$$

However, searchers are not willing to pay this price and they start the search with the reservation level wL_0. Who can pay this price? Obviously, there are consumers that are not interesting in search. Really, zero search costs don't mean that consumers have not the propensity to search at all. Equation (2) simply takes the following form:

$$w\frac{\partial L}{\partial S}=-w\frac{L}{T} \quad (7)$$

The search is not interesting for *shoppers* because at this price level, where all *shoppers* are still *price-takers* and therefore *price-reduction-takers*, the search, let's take for illustrative simplicity a single unit purchase, produces absolute marginal savings that are not greater then absolute marginal losses in labor income, or:

$$\left|-w\frac{L}{T}\right|\geq\left|\frac{\partial P}{\partial S}\right| \quad (8)$$

It means that the zero-search-costs level collects all buyers with willingness to pay higher or equal to the price that represents the full attractiveness of an item. However, the inequality of marginal values of search is not stable. *Shoppers* with very high wage rate need less time to restore their cash balances and they reduce the expected time-horizon. The cut in the expected time horizon by saving in labor time decreases the absolute value of propensity to search (Figure 2):

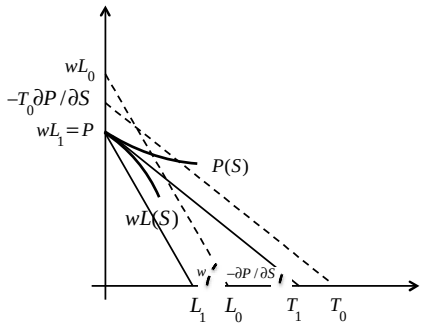

Figure 2. *Adjustment of high WTP*

$$wL_0 >> P; \left| w\frac{L_0}{T_0} \right| > \left| \frac{\partial P}{\partial S} \right| \Rightarrow wL_0 > -T_0 \frac{\partial P}{\partial S};$$

$$L_1 < L_0; T_1 = T_0 - dL;$$

$$\left| w\frac{L_1}{T_1} \right| = \left| \frac{\partial P}{\partial S} \right| \Rightarrow wL_1 = P = -T_1 \frac{\partial P}{\partial S} \quad (9)$$

The process of adjustment of time horizon of consumers with different high willingness to pay eliminates the inequality of marginal values of search in Equation (8) and all consumers with high willingness to pay equalize their marginal losses in labor income with marginal savings at this price level:

$$w_a L_a = w_b L_b = ... = w_n L_n = -T\partial P / \partial S = P \Rightarrow \frac{\partial P}{\partial S} = w_n \frac{L_n}{T} \quad (10)$$

However, when the value of price reduction is given, we see that at this price level market adjusts different perceptions of time horizons and makes itself really homogenous with the unique time horizon.

The existence of that unique or the ***equilibrium time horizon*** explains why economics prefers to envisage a calendar time horizon – a day, a week, a year. When markets are perfect and search costs are equal to zero, it is rational to compare consumers on the basis of some calendar period. However, consumers take into account another consideration. They esteem time horizon as the ***period from one purchase to another***. This period might correspond to the calendar and might be shorter or longer – two-three days, a couple of weeks, or some years. We will see that consumers with positive search costs have different time horizons. The equilibrium time horizon exists only for consumers with zero search costs because it corresponds to ***the level of equilibrium price***. If we do not take into account for the moment the existence of upper price niche where consumers with high willingness to pay, suffering from the "snob effect" at the equilibrium price level, can search and make ambitious purchases, we can say that the equilibrium price level is equal to the lowest willingness to pay between high-income consumers with zero search costs.

For the moment, these considerations follow the assumption that "the price in the high-price stores is the reservation price of shoppers with high willingness to pay, not their maximum willingness to pay for the good" (Diamond 1987, p.434). However, the possibility to adjust time horizon attracts to this price level or to the high-price store also some low-income consumers. Impatient low-income consumers can compensate at this price level the low wage rate by high propensity to search that results in earlier and more intensive consumption. The acceleration of consumption changes the time horizon. And impatient low-income consumers should accept not only the equilibrium price but also the equilibrium time horizon, which is shorter than the time horizon of their easy-going low-income neighbors. The reduction in the time horizon transforms the initial inequality of marginal values of search that encourages easy-going low-income consumers to search, into the optimal equation for their impatient low-income neighbors that eliminates the need to look or to wait for low price:

$$\left| w\frac{\partial L}{\partial S} \right| < \left| \frac{\partial P}{\partial S} \right|; -w\frac{L}{T_0} < \frac{\partial P}{\partial S}; T_1 < T_0; -w\frac{L}{T_1} = \frac{\partial P}{\partial S} \quad (11)$$

In fact, the famous example of tourists, looking for a restaurant (Salop and Stiglitz 1977), can be revised under this assumption of impatience. Even low-income tourists don't want to waste time, they choose the restaurant for a lunch on their way, and in the evening they become hungry earlier and they are ready to take a dinner.

Generally, low-income consumers do not accept the equilibrium price level, which is appropriate for their high-income friends or low-income impatient neighbors. Easy-going low-income consumers can take an advantage of their low wage rates and low propensity to search with respect to great marginal savings produced by the equilibrium price level. *Searchers* begin to look for low prices with regard to their willingness to pay. Of course, they esteem the total *aller-et-retour* time of search, i.e. the time to get in and out. Some of them search in out-of-town commercial centers and some of them at factories' outlets where purchase prices P_p are really different (P_a, P_b…P_n). However, ***wherever they make purchases their willingness to accept comes to the equilibrium price level*** (Figure 3):

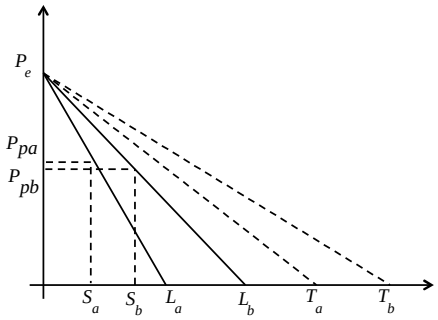

Figure 3. *Equilibrium price, purchase prices, and WTA of heterogeneous searchers*

$$w_a(L_a+S_a)=-T_a\partial P_a/\partial S_a=w_b(L_b+S_b)=-T_b\partial P_b/\partial S_b=...=w_n(L_n+S_n)=-T_n\partial P_n/\partial S_n=P_e \quad (12)$$

Really, our hypothetical price P from Figure1 is equal to the equilibrium price P_e. It equalizes different costs of purchase $w(L+S)$ of heterogeneous consumers with positive search costs.

3. Arbitrage of Suboptimal Purchases

What happens when price dispersion is distorted and some prices don't result in corresponding marginal savings? This is the same thing that takes place when ***satisficing decision seems to be suboptimal***.

Generally, *searchers* begin to look for low prices when the search is interesting, or the marginal loss in labor income is less than the marginal saving:

$$\left|w\frac{\partial L}{\partial S}\right|<\left|\frac{\partial P}{\partial S}\right| \quad (13)$$

Let us suppose that the satisficing choice of the first quote below the reservation level ($\partial^2L/\partial S^2<0$) stays suboptimal in accordance with Equation (13). However, if it is suboptimal, the *searchers*' willingness to accept or to sell stays below the equilibrium price level, more definitely, below the lowest zero-search-costs willingness to pay (Figure 4):

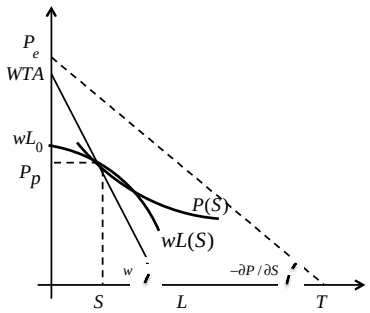

Figure 4. *Resale of suboptimal purchase*

$$\left|w\frac{\partial L}{\partial S}\right|<\left|\frac{\partial P}{\partial S}\right|;\left|-w\frac{L+S}{T}\right|<\left|\frac{\partial P}{\partial S}\right|\Rightarrow w(L+S)<-T\frac{\partial P}{\partial S}=P_e \quad (14)$$

If it happens, ***searchers will sell their purchases to shoppers***. This extra supply drops the equilibrium zero-search-costs price level down to the level where arbitrage becomes unprofitable for *searchers*, i.e., to the level where they equalize marginal values of search, and, to its turn, this equality matches their willingness to accept with a new equilibrium price.

In addition, this new equilibrium price level reinforces the team of *shoppers* by newcomers from lower income bracket of *searchers* that makes the high-price store noisy and the equilibrium price level really becomes intolerable for snobs among *shoppers*.

The same effect takes place when a *searcher* finds an unexpected great discount, which results in unexpected low price. And, facing Equation (13), either the *searcher* adjusts the time horizon of his choice according to Equation (11), for example, due to shorten shelf-life of a product (Malakhov, 2014a), or he makes an arbitrage. Adjustments of time horizon, i.e., decision to cut or to extend products' lifecycles at the moment of purchase reduce possibilities of arbitrage. The analysis of the increase in the time horizon with the increase in quantity to be purchased when the quote is dissatisfying is presented in Malakhov (2014b). It means that we can expect resale to be a common economic phenomenon in markets with fixed time horizons where adjustments are not possible. And it really takes place in markets of tickets for events (Courty, 2003).

Hence, arbitrage and adjustment of time horizon transform suboptimal decisions of *searchers* into satisficing optimal choices. Finally, the equilibrium price level collects different willingness to accept of *searchers* with different wage rates and different propensities to search.

Thus, the equilibrium price is equal to the willingness to accept of *searchers*, which is equal to the lowest willingness to pay of *shoppers* with zero search costs and where *all individuals* equalize their marginal losses in labor income with their marginal savings on purchases.

This assumption takes us back to the classical optimal consumption-leisure choice:

$$\frac{\partial U/\partial H}{\partial U/\partial Q}=-\frac{w}{\partial P/\partial S}\partial^2 L/\partial S\partial H=-\frac{w}{T\partial P/\partial S}=\frac{w}{w(L+S)}=\frac{w}{P_e} \quad (15)$$

We see, that slight modifications in Stigler's revolutionary equation do not change the general economic sense of exchange. The "law of one price" holds in spite of persistent price dispersion. Consumers with positive search costs optimize their purchasing decisions that result in the corresponding marginal rate of substitution of leisure for consumption not with respect to the purchase price but with respect to the equilibrium price.

The detailed answer to the question, whether sellers agree with that conclusion or not, stays beyond the scope of this paper but it might be framed by some comments.

In the model presented here sellers meet different willingness to pay. They try to discriminate *shoppers* and to propose additional services to consumers with very high willingness to pay that could suffer from the "snob effect" at the equilibrium price level in order to separate them. The discrimination might be explicit when sales are made on high streets where consumers get a positive externality of prestige purchases, or implicit, like it happens in web 'clearinghouses' where a set of different prices does not exhibit the total sellers' heterogeneity. However, *searchers* can adjust their propensity to search to different quotes when they reconsider time horizons of their purchases with regard to seller's reputation, post-purchase services, etc. When this uncertainty begins to worry *shoppers* they become *searchers*. They either begin to investigate seller's reputation, or they look for a new market with more guarantees. The appearance of stable upper price niche, i.e., ***the organization of a new market***, does not change the logic of consumers' decision-making. The search model presented here slightly decorates a Walrasian market. ***The stable upper price niche can be considered as a new market if it creates a new group of zero-search-costs consumers.*** If such a group appears, other consumers with high willingness to pay become *searchers* and they either make satisficing optimal purchases when they search for prestigious items, or their purchases are suboptimal and a new *searchers* immediately finds some *shopper* who can buy at zero search costs an item that has been already found and bought. And numerous web sites for resale of luxuries demonstrate that it is possible. If such a group does not appear, all consumers with high willingness to pay can make resale only at the original equilibrium price level and a consumer who has overpaid for an item can sell it only with a loss at this level to other zero-search-costs consumers. The satisficing purchases are made within the "common model" of behavior even on markets of luxuries. This is not true for the "leisure model" of behavior that produces Veblen effect (Malakhov, 2015).

The sellers' tactics in front of *searchers* is definitely artless – they redistribute transaction costs in order to charge consumers' costs of search, especially when search entails travel costs. The idea to sell for *searchers* at the equilibrium price level, like it is presumed by the Diamond's Paradox, is not fruitful even if sellers have a monopoly power to reinforce consumers to pay a monopoly price. There, producers should incorporate all transaction costs and they sell at the zero-search-costs level only in the high-price store. If

searchers should buy at this equilibrium price, they will bring to labor market all time of search. This extra labor supply decreases wage rates and makes the equilibrium price level unattainable. Hence ***sellers should also stay heterogeneous***. And information clearinghouses, newspapers and web sites, simply "discount" different terms of sale to some one-dimension list of price quotes. In practice, readers of newspapers and sites' visitors see only the vertical axis of Figure 3, where the price dispersion is evident. It might not be stable if some searchers find a possibility of arbitrage. But in general these information clearinghouses demonstrate some persistent price dispersion where different price quotes correspond to different income levels, different propensity to search, and different time horizons.

4. Conclusion

The analysis of propensity to search that optimizes satisficing purchasing decisions shows that the "law of one price' holds in an imperfect homogenous market if there are consumers with zero search costs. These consumers have different willingness to pay but they make purchases at the level of the lowest zero-search-costs willingness to pay. Consumers with positive search costs are also heterogeneous but they have the same willingness to accept or to sell that matches the lowest willingness to pay of consumers with zero search costs at the equilibrium price level. Arbitrage adjusts not only prices but also the propensity to search that equalizes marginal losses in labor income during the search with marginal savings on purchase on a new equilibrium price level. When purchase decisions of consumers with positive search costs are optimal arbitrage doesn't take place.

The equilibrium price level does not eliminate price dispersion. Consumers have different willingness to pay and they meet heterogeneous sellers. Sellers try to discriminate consumers and, if they find a zero-search-costs demand, the new market is organized.

The arbitrage of suboptimal purchasing decisions can be used as the starting point for the analysis of equilibrium price level under persistent price dispersion. There are some important issues that should be covered by following studies. Usually, arbitrage does not represent a common practice but there are searchers who can use it by definition, i.e., marginal searchers who live near productive units. They are still consumers but they also operate as part-time sellers. Saturday markets represent the perfect exhibition of this practice.

Although the re-allocation of transaction costs from producers to consumers does not cover the total sellers' heterogeneity it can be followed by very interesting studies. Producers also might differ in their search tactics. Some of them are sellers with zero search costs, here in search for buyers, and some of producers are searchers. This type of heterogeneity needs some efforts in the theory of games because here sellers meet searching consumers and shoppers meet searching producers.

References

Adams, F.A., 1997. Search Costs and Price Dispersion in a Localized, Homogenous Product Market: Some Empirical Evidence, *Review of Industrial Organization*, 12(5-6), pp.801-808.

Aguiar, M. and Hurst, E., 2007b. Life-Cycle Prices and Production, *American Economic Review*, 97(3) pp.1533-1559

Baye,M., Morgan, J. and Sholten, P., 2006. Information, Search, and Price Dispersion In: T.Hendershott (Eds.) Economics and Information Systems, Vol.1, Elsevier, Amstersdam, pp.323-376

Burdett, K. and Judd, K., 1983. Equilibrium Price Dispersion, *Econometrica,* 51(4), pp.955-969.

Carlson, J.A. and McAfee, R.P., 1983. Discrete Equilibrium Price Dispersion, *Journal of Political Economy,* 91(3), pp.480-493.

Courty, P., 2003. Some Economics of Ticket Resale, *Journal of Economic Perspectives*, 17(2), pp.85-97.

Diamond, P., 1971. A Model of Price Adjustment, *Journal of Economic Theory*, 3, pp.156-168.

Diamond, P., 1987. Consumer Differences and Prices in a Search Model, *Quarterly Journal of Economics*, 102, pp.429-436.

Fishman, A., 1992. Search Technology, Staggered Price-Setting, and Price Dispersion, *American Economic Review*, 82(1), pp.287-298.

Janssen, M. and Moraga-González, J.L., 2004. Strategic Pricing, Consumer Search and the Number of Firms, *Review of Economic Studies,* 71(4), pp.1089-1118.

Janssen, M. and Moraga-González, J.L., Wildenbeest, M., 2005. Truly Costly Sequential Search and Oligopolistic Pricing, *International Journal of Industrial Organization* 23(5), pp.451-466.

Lach S., 2002. Existence and Persistence of Price Dispersion: An Empirical Analysis, *Review of Economics and Statistics*, 84(3), pp.433-444.

Leibenstein H., 1950. Bandwagon, snob, and Veblen effects in the theory of consumers' demand, *Quarterly Journal of Economics*, 64,(2), pp.183-207.

McMillan, J. and Rothschild, M., 1994. Search' In Handbook of Game Theory, Volume 2, R.J. Aumann and S. Hart (eds.) Elsevier Science B.V., pp.906-927.

Malakhov, S., 2013. Money Flexibility and Optimal Consumption-Leisure Choice' *Theoretical and Practical Research in Economic Fields*, IV (1), pp.77-88. [online] Available at: http://www.asers.eu/asers_files/tpref/TPREF%20Volume%20IV%20Issue%201_7_%20Summer%202013_last.pdf)

Malakhov, S., 2014a. Satisficing Decision Procedure and Optimal Consumption-Leisure Choice.' *International Journal of Social Science Research*, 2 (2), pp.138-151 [online] Available at: http://dx.doi.org/10.5296/ijssr.v2i2.6158

Malakhov, S., 2014b. 'Sunk Costs of Consumer Search: Economic Rationality of Satisficing Decision, *Theoretical and Practical Research in Economic Fields*. V: 1(9), pp.53-62 [online] Available at: http://www.asers.eu/asers_files/tpref/TPREF%20Volume%20V%20Issue%201(9)%20Summer%202014.pdf

Malakhov, S., 2014c. Willingness to Overpay for Insurance and for Consumer Credit: Search and Risk Behavior Under Price Dispersion, *Expert Journal of Economics*, 2(3), pp.109-119 [online] Available at: http://economics.expertjournals.com/wp-content/uploads/EJE_213malakhov2014pp109-119.pdf

Malakhov, S., 2015. Propensity to Search: common, leisure, and labor models of behavior, *Expert Journal of Economics*, 3(1), pp.63-76 [online] Available at: http://economics.expertjournals.com/wp-content/uploads/EJE_308malakhov63-76.pdf

Manning, R., 1997. Budget-Constrained Search' *European Economic Review*, 41(9), pp.1817-1834

Pratt J,W., Wise D.A. and Zeckhauser R.I., 1979. Price Differences in Almost Competitive Markets, *Quartely Journal of Economics*, 93, pp.189-211.

Reinsdorf, M., 1994. New Evidence on the Relation Between Inflation and Price Dispersion, *American Economic Review*, 84(3), pp.720-731.

Rosenthal, R.W., 1980. A Model in Which an Increase in the Number of Sellers Leads to a Higher Price, *Econometrica*, 48(6), pp.1575-1579.

Rothschild, M., 1974. Searching for the Lowest Price When the Distribution of Prices Is Unknown, *Journal of Political Economy*, 82(4), pp.689–711.

Salop, S. and Stiglitz, J., 1977. Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion, *The Review of Economic Studies*, 44, pp.493- 510.

Salop S. and Stiglitz J.E., 1982. The Theory of Sales: A Simple Model of Equilibrium Price Dispersion with Identical Agents, *American Economic Review*, 72(5), pp.1121-1130.

Stahl, D. O., 1989. Oligopolistic Pricing with Sequential Consumer Search' *American Economic Review*, 79(4), pp.700–712.

Stigler, G., 1961. The Economics of Information, *Journal of Political Economy*, 69(3), pp.213-225.

Stiglitz J.E., 1979. Equilibrium in Product Markets with Imperfect Information, *American Economic Review*, 69(2), pp.339-345.

Varian, H.R., 1980. A Model of Sales, *American Economic Review*, 70(4), pp.651-659.