

Zimmermann, Florian

Conference Paper

Experimental Evidence on Preferences for Information

Beiträge zur Jahrestagung des Vereins für Socialpolitik 2010: Ökonomie der Familie - Session:
Experimental Tests of Theories and Institutions, No. D13-V3

Provided in Cooperation with:

Verein für Socialpolitik / German Economic Association

Suggested Citation: Zimmermann, Florian (2010) : Experimental Evidence on Preferences for Information, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2010: Ökonomie der Familie - Session: Experimental Tests of Theories and Institutions, No. D13-V3, Verein für Socialpolitik, Frankfurt a. M.

This Version is available at:

<https://hdl.handle.net/10419/37214>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Experimental Evidence on Preferences for Information ^{*}

Florian Zimmermann

Bonn Graduate School of Economics, University of Bonn

26th August 2010

Very Preliminary — please do not cite or circulate without permission.

Abstract

In a recent paper, Kőszegi and Rabin (2009) propose a dynamic model of reference-dependent preferences, where people are assumed to be loss averse with regard to anticipated changes in beliefs about future consumption. Their model makes a novel prediction about people’s attitudes towards noninstrumental information, i.e. information about “fixed but unknown future outcomes”. People prefer to get information “clumped together” rather than piecewise. We use a controlled lab experiment to examine this prediction. We find no evidence in support of the model by Kőszegi and Rabin.

1 Introduction

People often evaluate outcomes not in absolute terms, but relative to a reference point. Furthermore, they feel losses relative to that reference point more heavily than gains, leading to a kink in the utility function. Reference-dependence of preferences and loss aversion are key aspects of Kahneman and Tversky’s (1979) famous “Prospect Theory”. A central question for this theory is what determines the reference point? Is it driven by past outcomes, the status-quo, or does it depend on people’s expectations? In two influential papers, Botond Kőszegi and Matthew Rabin (2006, 2007) propose a theory of reference-dependent preferences, where the reference point is determined by rational expectations. By building a model where the reference point is determined endogenously, Kőszegi and Rabin allow for easy application of their model to various settings of economic relevance.¹

In a recent paper, Kőszegi and Rabin (2009), put forward their theory. They develop a dynamic model of reference-dependent preferences. Central assumption in their model is that utility depends on anticipated changes in beliefs about current and future consumption. Beliefs are rational and people are loss averse with regard to changes in their beliefs. Thus bad news about future consumption decrease utility more than good news increase it. Furthermore it is assumed that people care less about changes in beliefs, the further away the time of belief change lies from the actual point of consumption. In other

^{*}Financial support from the Bonn Graduate School of Economics (BGSE) is gratefully acknowledged.

¹See for example Heidhues and Kőszegi, 2008 or Herweg et al., forthcoming.

words, a person is assumed to be less sensitive to changes in beliefs, the more time lies inbetween news and the time of consumption.

The model by Kőszegi and Rabin has implications for informational preferences i.e. preferences towards information about “fixed but unknown” events. The model predicts, that decision-makers are not indifferent towards the timing of information about uncertain outcomes which cannot be affected by the decision-maker. While most economic models neglect preferences towards the timing of information, a couple of theoretical papers have analyzed informational preferences. Kreps and Porteus (1978) examine tastes for the temporal resolution of uncertainty in an axiomatic choice-theoretical framework. Caplin and Leahy (2001) incorporate anticipatory emotions towards uncertainty into an expected utility framework and analyse effects, for example on portfolio choice. In another paper, Caplin and Leahy (2004), use an expected utility framework with anticipatory emotions to analyse how much information an expert should transmit to a poorly informed person. While these models assume a certain preference towards the timing of information, Kőszegi and Rabin derive such preferences from their model. The novel implication of their model is that people prefer to get information in one piece rather than piecewise.

To clarify, consider the following example. Imagine the soccer world cup final just took place. Unfortunately you could not watch it, but you have heard that it was decided by penalty shootout. You now have two options to learn who the new world champion is, either watch a replay or simply check the outcome on the internet. Assume you do not get utility from watching the shootout as such, but the outcome matters a lot to you. Will you decide to watch the replay or check the outcome via internet right away? Kőszegi and Rabin predict that you choose the internet. The replay will expose you to piecewise information and thus fluctuations in your beliefs on who won the final, whereas the internet informs you right away.

In this paper we use a controlled lab experiment to test the prediction that piecewise information is utility-decreasing. By doing so we directly test for central implications of the model. To our knowledge, we are the first to do so. Furthermore we add to the existing experimental literature on informational preferences.² This literature so far has focused on examining whether people have a preference for early or late resolution of uncertainty.

We believe that lab experiments are well suited to examine Kőszegi and Rabin’s predictions, in particular, because they allow us to control for the noninstrumentality of information. In field settings this appears to be much more difficult. In our experiment, subjects were presented a lottery and were asked to state their willingness to pay for the lottery. We systematically varied the timing of the resolution of uncertainty in the lottery in a between-subjects design. Either subjects learned the outcome of the lottery in one piece, or they were sequentially informed about it. Information in this setting is non-instrumental in the sense that the lottery is a completely exogenous event, which cannot be influenced by the subjects. The model by Kőszegi and Rabin predicts, that subjects should have a higher willingness to pay if the outcome of the lottery is revealed in one piece. Therefore, comparison of the average willingness to pay between subjects in different information conditions provides a clean test of Kőszegi and Rabin’s prediction. In order to be able to examine on an individual level, if subjects behave according to the model’s predictions, we ran additional treatments, where subjects could directly choose between the two information conditions in an incentive compatible way.

We do not find evidence in favour of Kőszegi and Rabin’s model. In fact, average willingness to pay

²See Eliaz and Schotter (2007, 2009), van Winden et al. (2008), Kocher et al. (2009).

for the lottery is about 2 Euro higher when subjects are sequentially informed about the outcome of the lottery. When subjects can directly choose between the two information conditions, our data suggest that most subjects are indifferent between the two conditions. We conclude that for the kind of decision situations we can create in the lab, the predictive power of the model is limited. The remainder of the paper is organized as follows. The next section briefly describes the model of Kőszegi and Rabin and states the prediction we want to test, Section 3 presents the experimental design, Section 4 shows the results and Section 5 concludes.

2 The Model of Kőszegi and Rabin

In this section we present the basic model of Kőszegi and Rabin, focusing on the elements necessary to derive their propositions regarding informational preferences. We very closely follow their notation. For a more detailed presentation of the model we refer to the original paper, Kőszegi and Rabin (2009).

The model is in discrete-time with $T + 1$ periods, 0 through T . Decision-makers consume K goods. In all periods $t \geq 1$, consumption $c_t = (c_t^1, \dots, c_t^K)$ is realized. At the beginning of period t , the decision-maker holds beliefs $F_{t-1} = \{F_{t-1,\tau}\}_{\tau=t}^T$, with $F_{t-1,\tau} = (F_{t-1,\tau}^1, \dots, F_{t-1,\tau}^K)$ being the belief about the consumption vector in period τ . Then, some signals may arrive and the decision-maker accordingly forms new beliefs $\{F_{t,\tau}\}_{\tau=t}^T$, where no uncertainty is left regarding consumption in period t .

Instantaneous period- t utility depends on consumption in t and on belief changes in t regarding contemporaneous and future consumption:

$$u_t = m(c_t) + \sum_{\tau=t}^T \gamma_{t,\tau} N(F_{t,\tau} | F_{t-1,\tau})$$

$m(c_t)$ denotes reference-independent consumption utility and the terms $N(F_{t,\tau} | F_{t-1,\tau})$ represent “gain-loss utility” from belief changes. $\gamma_{\tau,\tau} \geq \gamma_{\tau-1,\tau} \geq \dots \geq \gamma_{0,\tau} \geq 0$ are the weights on gain-loss utilities. $\gamma_{t,t}$ is normalized to 1. The weights γ represent the importance of new information depending on how far in advance of actual consumption the news are received. Importance decreases, the earlier new information realized.

Gain-loss utilities are specified such that decision-makers make ordered comparisons between current and previous beliefs about consumption. It is assumed that decision-makers compare the worst percentile of outcomes under current beliefs to that under previous beliefs, the second-worst percentile under current and previous beliefs and so on.

Formally we define percentile p implicitly by stating that for any distribution F over R and any $p \in (0, 1)$, the consumption level at p , $c_F(p)$ is defined by $F(c_F(p)) \geq p$ and by $F(c) < p$ for all $c < c_F(p)$. Then we can define gain-loss utility from the change in beliefs in consumption dimension k as:

$$N^k(F_{t,\tau}^k | F_{t-1,\tau}^k) = \int_0^1 \mu(m^k(c_{F_{t,\tau}^k}(p)) - m^k(c_{F_{t-1,\tau}^k}(p))) dp$$

$\mu(\cdot)$ is a “standard” gain-loss utility function with the following properties taken from Bowman et al. (1999):

1. $\mu(x)$ is continuous for all x , twice differentiable for $x \neq 0$, and $\mu(0) = 0$.
2. $\mu(x)$ is strictly increasing.
3. If $y > x \geq 0$, then $\mu(y) + \mu(-y) < \mu(x) + \mu(-x)$.
4. $\mu''(x) \leq 0$ for $x > 0$ and $\mu''(x) \geq 0$ for $x < 0$.
5. $[\mu'_-(0)]/[\mu'_+(0)] \equiv \lambda > 1$, where $\mu'_+(0) \equiv \lim_{x \rightarrow 0} \mu'(|x|)$ and $\mu'_-(0) \equiv \lim_{x \rightarrow 0} \mu'(-|x|)$.

Within these properties, loss aversion is captured in properties 3 and 5, diminishing sensitivity is captured by property 4.

Total gain-loss utility in period t is now assumed to be the sum of gain-loss utilities in each dimension, i.e. $N(F_{t,\tau} | F_{t-1,\tau}) = \sum_{k=1}^K N^k(F_{t,\tau}^k | F_{t-1,\tau}^k)$.

As a last step, it is assumed that the decision-maker wants to maximize the expected sum of instantaneous utilities,

$$U^t \equiv \sum_{\tau=t}^T u_\tau$$

We now have all the ingredients necessary to make predictions about informational preferences. These predictions follow directly from the basic underlying of Kőszegi and Rabin's model, loss-averse preferences over belief-changes. Following Kőszegi and Rabin, information here means information regarding "fixed but unknown future consumption". In other words, information has to be on exogenous events that cannot be influenced by the decision-maker.

For simplicity, we now assume that consumption takes place only in period T . Decision-makers may receive information about consumption from period 1 to $T - 1$. σ be a sequence of signals, s_1, s_2, \dots, s_J and $t(s_j | \sigma)$ denote the time of arrival of signal s_j under σ .

We want to make predictions about decision-makers preferences towards different information structures. For this purpose we introduce the following terminology. We call σ' to be (t_a, t_b, j) -equivalent to σ if both involve the same sequence of signals, if in both σ and σ' only s_j and s_{j+1} arrive between t_a and t_b (with $t_b > t_a$) and if for all $i \neq j, j + 1$, we have that $t(s_i | \sigma') = t(s_i | \sigma)$. Thus, if two sequences of signals are (t_a, t_b, j) -equivalent, they only differ in the timing of the two signals s_j and s_{j+1} .

The model of Kőszegi and Rabin makes the following central prediction. Clumping information is utility-increasing as long as no information is delayed through clumping. This is captured by Proposition 1.

Proposition 1: *Say that σ' is (t_a, t_b, j) -equivalent to σ and $t(s_{j+1} | \sigma') = t(s_j | \sigma') \leq t(s_j | \sigma) < t(s_{j+1} | \sigma)$. Then we have that $U(\sigma') > U(\sigma)$ for any $\gamma_{t,T} > 0$ nondecreasing in t .*

Thus decision-makers should prefer if different signals are collapsed into 1 signal if no signals are delayed in the process.³ In our experiment we want to test this prediction.

³For a proof of this proposition we refer to Kőszegi and Rabin (2009).

3 Experimental Design and Hypothesis

3.1 Experimental Design

In each session, subjects met on a Monday in the *BonnEconLab*. Subjects were welcomed and assigned into cabins, then instructions were passed and read aloud. Each subject was endowed with a lottery ticket. Part of the lottery was a starting endowment of 30 Euro. All payments from the lottery were paid to the subjects on Friday of the same week, i.e. subjects had to come to the lab twice. The lottery worked as follows. A fair dice was thrown three times and the numbers thrown were added up. If the total sum after three throws was larger or equal than 13, subjects won 50 Euro which were added to their starting endowment of 30 Euro. In case the total sum was smaller than 13, subjects lost 15 Euro which were deducted from their starting capital. The lottery has an expected value of about 32 Euro and a standard deviation of 28,5.

Central feature of the lottery was that it offered a natural sequence of signals on the outcome of the lottery. Each of the three dice throws represented a piece of information, allowing subjects to update their beliefs regarding the outcome of the lottery.

Our experiment consisted of two main treatments, the Clumped Early treatment (CE) and the Piecewise treatment (P), which differed in the information structure. In the CE-treatment, subjects learned the outcome of the lottery at one point in time, whereas in the P-treatment, subjects were informed sequentially, learning one outcome of the dice throws after the other.

How did we inform subjects about the outcome of the lottery? From tuesday to thursday, subjects had to call the experimenter once a day.⁴ Subjects were told that failure to call in would lead to the loss of all their earnings from the experiment. During the phone calls, subjects were informed about whether they won in the lottery or not. We chose to inform subjects via telephone because we wanted to make sure that they actually absorb the information. Via phone calls we achieved complete control over when information was received and absorbed, which was necessary to make clear theoretical predictions. In the CE-treatment, subjects were informed on tuesday whether they won in the lottery or not and which numbers were thrown for them. In the P-treatment, subjects learned the result of one dice throw each day. Thus they usually did not know before thursday whether they won in the lottery or not.⁵ Note that in both treatments subjects had to call once a day from tuesday to thursday and that the duration of the phone calls always was approximately one minute.⁶ This was made clear to subjects in the instructions. The design was between subjects, so each subject only participated in one treatment.

We chose to run the experiment over days, in order to make the changes in the information structure quite drastic. In principal, Kőszegi and Rabin's model leaves open how long one time period t is, i.e. it could be one second or one month. When testing predictions of their model, we implicitly make assumptions about the length of a time period. To be precise, we assume that the different signals in the Piecewise treatment belong to different time periods in the perception of the subjects.

⁴Subjects could call from 9am to 12pm and from 2pm to 5:30pm. Alternatively they could show up personally in the experimenter's office which only one subject chose to do.

⁵Of course sometimes subjects already knew on wednesday whether they won or lost. To be precise this was the case when the sum after two throws was either 12, or lower than 7.

⁶Apart from informing them about the outcome of the lottery, subjects were reminded of their duty to call in the next day, the time they could pick up their money and they were asked whether they remembered the cabin number they were seated in during the session.

The only decision subjects had to make was to choose their willingness to pay for the lottery. We used an incentive compatible multiple price list format to ask subjects which certain amount (also to receive on Friday) they would prefer over the lottery.⁷ Subjects had to make 25 choices between the lottery and a certain amount which was increased from 13 Euro to 37 Euro in increments of 1 Euro. One of the 25 choices was afterwards randomly selected and implemented. If subjects behaved consistently, they at maximum switched ones between the lottery and the fixed payment. This switching point represents subjects' willingness to pay for the lottery. Comparison of the average willingness to pay for the lottery between the CE-treatment and the P-treatment allowed us to gain clean evidence on Kőszegi and Rabin's prediction. Due to the between-subjects design, subjects only learned about one of the two information conditions. Therefore experimenter demand effects were unlikely to play a role.

The disadvantage of a between-subjects design was that we could not determine on an individual level, whether subjects were averse against piecewise information. Therefore we also ran a third treatment. Subjects played a lottery which was identical to that in the first two treatments. What changed was the method we used to elicit subjects' preferences over the two information conditions. We introduced both information conditions, Clumped Early and Piecewise, to the subjects and let them choose between them. We again used the incentive compatible multiple price list format to possibly get a measure on how much subjects preferred one information condition over the other. Subjects had to make a total of nine choices, from which one would be randomly chosen and implemented. Each choice was between the two information conditions, where a fixed Euro-amount was added to one of the two information conditions. The amounts were varied in 50 Cent-intervals, starting from 50 Cent and going up to 2 Euro. One choice was simply between the two information conditions, giving us nine choices in total.

We ran an additional fourth treatment to test the robustness of our results. Treatment 4 was basically identical to treatment 3, only the lottery changed. In treatment 4 we put the payoff differences in the lottery to the limit, letting subjects either gain 500 Euro or zero.⁸ The lottery worked as follows. In three rounds three dice were thrown simultaneously. Subjects won in the lottery, if in at least one round, all three dice showed a six. The lottery has an expected value of about 7 Euro, and a standard deviation of roughly 58,7. The two information conditions were identical to the other treatments. In the Clumped Early condition, subjects learned whether they won or not during the first phone call on Tuesday. In addition, on Tuesday they were informed about the exact results of the dice throws for all three rounds. Accordingly, in the Piecewise condition subjects learned the results of one dice throw per day, from Tuesday until Thursday. As in treatment 3, subjects could directly choose between the two information conditions in a price list format. Subjects had to make a total of nine choices where one was chosen randomly and implemented. We slightly changed the fixed amounts that were added to the alternatives.⁹

Note that information in this setting is non-instrumental in the sense that the lottery is a completely exogenous event which cannot be influenced by the subjects. One might however argue that information has some instrumental value because it may allow subjects to improve their decision whether to stop participating in the experiment or not, i.e. to stop calling in or to not pick up their money on Friday, depending on whether they won in the lottery or not or on their chances of winning in the lottery. If this were the case, subjects should have preferred the CE-treatment over the P-treatment, because it provided them with all the information on Tuesday, allowing them to decide on Tuesday whether the revenues from

⁷See Holt and Laury (2002) for the multiple price list format.

⁸In addition, in treatment 4 subjects received a show-up fee of 15 Euro.

⁹Fixed amounts in treatment 4 started with 25 Cents and then were doubled up to 2 Euro.

the experiment outweigh the cost of calling in and picking up the money. We argue that the minimum payoff from the lottery (15 Euro) is big enough for subjects to continue with the experiment, even if they know they lost in the lottery. This is supported by the low number of subjects who failed to call in or to collect their revenues from the experiment and by the fact that these numbers are not different between treatments. Furthermore, in case this argument were valid, it would only bias our results in favour of Kőszegi and Rabin’s model.¹⁰

In the Clumped Early and the Piecewise treatment, at the end of the experiment, we also elicited a measure for risk preferences. Subjects faced 25 choices between a lottery and a fixed payment. The lottery was the same across choices and paid zero or 3 Euro, each with probability 0.5. The fixed amount was increased in 10 Cent increments, starting from 30 Cent and going up to 270 Cent. Again, one choice was randomly picked and implemented.

3.2 Hypothesis

What behavior do Kőszegi and Rabin predict? It should be fairly obvious that the model predicts that willingness to pay for the lottery is higher in the CE-treatment, because in that treatment the signals are collapsed into one. This can be easily shown by iteratively applying proposition 1. Consider a hypothetical information sequence σ^h where subjects learn the result of the first dice throw on tuesday and on wednesday they learn the final outcome, i.e. whether they won or lost. Clearly, for the comparison of σ^h with the information sequence in the P-treatment, one can see that proposition 1 applies, stating that subjects should strictly prefer σ^h . For the comparison of σ^h and the information sequence in the CE-treatment, we can again apply proposition 1, giving us that subjects should strictly prefer the sequence of the CE-treatment to σ^h . Therefore, subjects should strictly prefer the CE-treatment over the P-treatment and consequently average willingness to pay for the lottery should be higher in the CE-treatment.

HYPOTHESIS 1: The average willingness to pay for the lottery should be higher in the CE-treatment than in the P-treatment.

Regarding treatments 3 and 4, we call subjects who are willing to sacrifice money for one information condition to have a strong preference for this information condition. Accordingly, if subjects are not willing to sacrifice money, we interpret their decision in the choice where no fixed amount was involved as revealing a weak preference for the chosen information condition.

Thus in treatments 3 and 4, Kőszegi and Rabin predict that all subjects should at least reveal a weak preference for the Clumped Early Condition, and that some subjects might reveal a strong preference for Clumped Early information.

HYPOTHESIS 2: In treatments 3 and 4, all subjects reveal a weak preference for the Clumped Early condition and some may reveal a strong preference for Clumped Early.

¹⁰One might also argue that information in our setting might be instrumental in the sense that early information allows subjects to improve their intertemporal consumption smoothing. We believe that this effect is neglectable in our setting, given that consumption smoothing occurs over a whole life-span. Again, if this effect were present, it would only bias our results in favour of Kőszegi and Rabin’s model.

4 Results

All experiments were conducted using paper and pencil and took place at the *BonnEconLab* at the University of Bonn. A total of 101 subjects participated in the experiment. Subjects were students from different fields such as Agriculture, Economics, Geography, Law, Mathematics etc. Some subjects had participated in a lab experiment before.

In the Clumped-Early and the Piecewise treatment, a total of 56 subjects participated in four sessions. 3 subjects failed to make consistent choices in the multiple price list format, giving us a total of 53 observations, 28 in the CE-treatment and 25 in the P-treatment.¹¹ The average willingness to pay for the lottery over the 53 subjects was 25,94 Euro, the standard deviation was 5,24.

In the Clumped Early treatment, the average willingness to pay for the lottery was 24,85 Euro. In the Piecewise treatment, we find an average willingness to pay of 27,16 Euro (see Figure 1). Thus, on average, subjects valued the lottery more than 2 Euro higher in the P-treatment than in the CE-treatment, contrary to the prediction of Kőszegi and Rabin. This difference is however not statistically significant using a two-sided Wilcoxon rank-sum test¹² (p-value=0,19).¹³

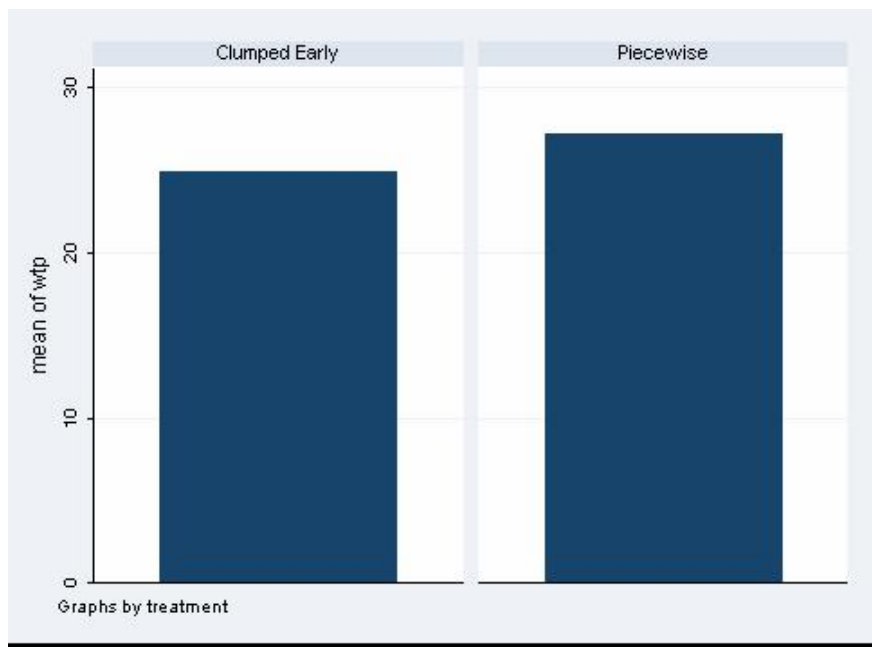


Figure 1: average willingness to pay by treatment

Given that there might be gender differences in risk preferences, we also consider men and women separately.¹⁴ Considering only male subjects we find a significant treatment effect using the rank-sum test (p-value=0,05). For female subjects, there is no significant effect. Thus, in our sample men show a

¹¹3 subjects failed to call in, 1 in the CE-treatment, 2 in the P-treatment. Removing them from the sample does not change results.

¹²All tests reported here are two-sided.

¹³Using OLS, we can also not reject the nullhypothesis that the coefficient of the treatment dummy is zero. When including a gender dummy, the p-value is 0,16.

¹⁴For a survey on the literature on gender differences in risk aversion, see Croson and Gneezy (2009).

preference for piecewise information. Given the low number of observations (23 men in our sample), we do not want emphasize this result too much.

Adding our measure for risk aversion in an OLS regression does not change results. The risk measure itself however is highly significant (p-value < 0,001) and has the expected sign. More risk averse subjects have a lower willingness to pay for the lottery.

RESULT 1: *From our two main treatments, we clearly find no support for Kőszegi and Rabin's model. If anything, we find weak evidence that subjects prefer piecewise information to clumped information, contrary to the model's predictions.*

When looking at behavior on the individual level, the picture remains the same. In treatments 3 and 4, a total of 45 subjects participated in four sessions, 22 subjects in treatment 3 and 23 in treatment 4.¹⁵ Remember that we call subjects who are willing to sacrifice money for one information condition to have a strong preference for this information condition. Accordingly, if subjects are not willing to sacrifice money, we interpret their decision in the choice where no fixed amount was involved as revealing a weak preference for the chosen information condition.

In treatment 3, only 2 subjects out of the 22 revealed a strong preference for one of the information conditions. Both of them were willing to sacrifice 50 Cent to be in the Piecewise condition. Thus no subject showed a strong preference for the Clumped Early condition. The remaining 20 subjects only showed a weak preference over the information conditions. 11 of them weakly preferred the Clumped Early condition, 9 weakly preferred the Piecewise Condition.¹⁶

In treatment 4, 13 subjects showed a preference (either strong or weak) for Clumped Early information, 8 showed a preference for Piecewise information. Compared to treatment 3, more subjects revealed a strong preference for either of the two conditions. Out of the 21 subjects, 2 showed a strong preference for the Clumped Early condition and three showed a strong preference for the Piecewise condition.

If we put treatments 3 and 4 together we find that 24 out of 43 revealed a preference for the Clumped Early condition (either strong or weak), whereas 19 revealed a preference for the Piecewise condition. Thus, also on an individual level we do not find support for Kőszegi and Rabin's model. Using a simple Binomial Test, we cannot reject the nullhypothesis that subjects randomized (with 50-50 probability) between choosing Clumped Early or Piecewise (p-value = 0,54).

RESULT 2: *Putting treatments 3 and 4 together, only 56 percent of subjects acted according to Kőszegi and Rabin's prediction. We cannot reject the nullhypothesis that subjects randomized between the two information conditions.*

5 Conclusion

In a recent paper, Kőszegi and Rabin (2009) make an interesting prediction about people's attitudes towards noninstrumental information. Their model suggests that people prefer to get information "clumped together" rather than piecewise. We use a controlled lab experiment to examine this prediction.

¹⁵In treatment 4, two subjects failed to answer consistently, leaving us 21 observations.

¹⁶Note that one of the subjects failed to call in at one day and one subject failed to pick up the money. One of them had a weak preference for Clumped Early information, the other a weak preference for the Piecewise condition.

By doing so we directly test for central assumptions of the model. Furthermore we add to the existing experimental literature on informational preferences.

We find no evidence in support of the model of Kőszegi and Rabin. We conclude from this that in the kind of settings one can create in a laboratory environment, the predictive power of the model is limited.

However, we clearly do not conclude that the predictive power of the model is low in general. The model assumes that people anticipate the utility consequences that follow belief changes about future consumption. It might very well be that for example in settings like medicine diagnosis, where very strong emotions are present, the model by Kőszegi and Rabin predicts behavior rather well. We therefore encourage field experimental work in settings where the presence of strong emotions can be expected.

6 References

- Bowman, David, Deborah Minehart and Matthew Rabin (1999). "Loss Aversion in a Consumption-Savings Model", *Journal of Economic Behavior and Organization*, Vol. 38(2), pp. 155-178.
- Caplin, Andrew, and John Leahy (2001). "Psychological Expected Utility Theory and Anticipatory Feelings." *Quarterly Journal of Economics*, Vol. 116(1), pp. 55-79.
- Caplin, Andrew, and John Leahy (2004). "The Supply of Information by a Concerned Expert." *The Economic Journal*, Vol. 114(497), pp. 487-505.
- Croson, Rachel and Uri Gneezy (2009). "Gender Differences in Preferences", *Journal of Economic Literature*, Vol. 47 (2), pp. 1-27.
- Eliasz, Kfir and Andrew Schotter (2007). "Experimental Testing of Intrinsic Preferences for Non-Instrumental Information", *American Economic Review (Papers and Proceedings)*, Vol. 97, pp. 166-169.
- Eliasz, Kfir and Andrew Schotter (2009). "Paying for Confidence: An Experimental Study of the Demand for Non-Instrumental Information", working paper.
- Heidhues, Paul and Botond Köszegi (2008). "Competition and Price Variation when Consumers Are Loss Averse", *American Economic Review*, Vol. 98(4), pp. 1245-1268.
- Herweg, Fabian, Daniel Müller and Philipp Weinschenk (forthcoming). "Binary Payment Schemes: Moral Hazard and Loss Aversion", *American Economic Review*.
- Holt, Charles A. and Susan K. Laury (2002). "Risk Aversion and Incentive Effects", *American Economic Review*, Vol. 92 (5), pp. 1644-1655.
- Kahneman, Daniel and Amos Tversky (1979). "Prospect Theory: An Analysis of Decision Under Risk", *Econometrica*, Vol. 47 (2), pp. 263-291.
- Kocher, Martin, Michal Krawczyk and Frans van Winden (2009). "Let me dream on! Anticipatory emotions and preference for timing in lotteries", working paper.
- Köszegi, Botond and Matthew Rabin (2006). "A Model of Reference-Dependent Preferences", *Quarterly Journal of Economics*, Vol. 121(4), pp. 1133-1165.
- Köszegi, Botond and Matthew Rabin (2007). "Reference-Dependent Risk Attitudes", *American Economic Review*, Vol. 97(4), pp. 1047-1073.
- Köszegi, Botond and Matthew Rabin (2009). "Reference-Dependent Consumption Plans", *American Economic Review*, Vol. 99(3), pp. 909-936.
- Kreps, David and Evan Porteus (1978). "Temporal Resolution of Uncertainty and Dynamic Choice Theory", *Econometrica*, Vol. 46(1), pp. 185-200.
- Van Winden, Frans, Michal Krawczyk and Astrid Hopfensitz (2008). "Investment, Resolution of Risk, and the Role of Affect", working paper.