Perceptions of Risk: an Experimental Approach using Internet Questionnaires

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Abstract

Building on previous studies on perceptions of inequality, welfare and risk we investigate the structure of individuals' rankings of uncertain prospects in terms of risk and their relationship to individual preferences. We examine three interlinked propositions that are fundamental to the standard economic approach to risk: (i) that rankings by risk are simply the reverse of ranking by preference over distributions with a given mean; (ii) that risk-rankings respect the principle of mean-preserving spreads; (iii) that risk-rankings are independent of whether the individual is personally involved in the gains/losses associated with the uncertain prospects. To do this we use a set of questionnaires implemented through the Virtual Laboratory, a novel experimental setting for the study of normative issues in experimental economics. The results from the questionnaires provide an evaluation of the similitude between individual perceptions of risk and theoretical axioms. They also help identify the individual characteristics that might affect such perceptions.

Keywords: Inequality, risk, experiment, transfer principle, mean-preserving spread.

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1 Introduction

This paper brings together economic theory and innovative methodology in order to focus on some key questions that lie at the heart of the theory of choice under uncertainty. We investigate the structure of individuals' rankings of uncertain prospects in terms of risk and their relationship to individual preferences. Specifically, we examine three interlinked propositions that are fundamental to the standard economic approach to risk:

1. that rankings by risk are simply the reverse of ranking by preference over distributions with a given mean;

2. that risk-rankings respect the principle of mean-preserving spreads;

3. that risk-rankings are independent of whether the individual is personally involved in the gains/losses associated with the uncertain prospects.

To address these issues we use questionnaire-experiments, building on previous studies on perceptions of inequality, risk and welfare. While the use of experiments in economics has progressed rapidly in recent decades, mainly in the study of markets and individual interactions, similar work on normative economics and the study of preferences is still comparatively rare. The literature described in Amiel and Cowell (1999) developed an original experimental setting for studying the empirical validity of inequality measurement axioms. We extend this technique in a number of ways.

The basic intuition is that the agents' personal judgements may not be captured adequately by conventional theory. The benchmarks against which the axioms are compared are the perceptions and judgements from responses to carefully specified questionnaire experiments. The use of such experimental techniques is a valuable tool for investigating the structure of individual's judgments about distributions of outcomes in terms of welfare, risk and uncertainty. While previous studies focused mainly upon whether responses conform to standard axioms of inequality analysis, it is our aim to extend the approach to cover the main assumptions of risk theory.

The results from the questionnaires provide an evaluation of the differences and similarities between individual perceptions of risk and theoretical axioms with respect to the three questions we outlined above. The experimental results also help identify specific response patterns and systematic differences in the determinants of attitudes toward risk in terms of observable characteristics of the respondents. This will assist in developing an approach to risk in economics that is based on evidence rather than assumptions of mathematical convenience.

We implement our questionnaire experiments through the Virtual Laboratory, a novel web-based experimental tool for the study of normative issues and preferences in economics. The use of the Virtual Laboratory represents an important methodological development in the field, providing researchers with a new facility that supersedes the paper questionnaires on which previous research was based.

The paper is organised as follows. Section 2 starts with a brief discussion of the theoretical background in terms of basic principles and previous research on the issue. Section 3 contains a description of our experimental setup, reviews the content of the experiment, and illustrates the advantages of the novel experimental methodology employed here. Finally, in Section 4 we present some results from the questionnaires we administered to a set of students. Conclusions follow.

2 Theory and background

In recent years experimental methods in economics have been extended to the analysis of income distributions (Amiel and Cowell 1999). One of the main purposes of this literature is to establish whether conventional approaches to modelling inequality, welfare and related concepts are consistent with the way individuals view income distributions. Since both the theoretical and empirical settings of this paper originate in this literature, we will briefly summarize its development in order to set the context for our research after an introduction to our main research question.

2.1 The meaning of risk

In the abstract, the concept of risk is remarkably difficult to pin down. Standard reference works fall back on either generalised descriptions or a simple enumeration of alternative interpretations.[1] In short: "people disagree more about what risk is than about how large it is" (Fischhoff 1985).

In the economics literature one might immediately think of a standard paradigm derived from the conventional model of choice under uncertainty – the expected utility (EU) model. However, despite the ubiquity of the

[1] For example Pass et al. (1993) states that "risk reflects the variability of future returns from a capital investment". Yates (1992) lists ten different definitions of risk on page 1. "Risk should not, however, be confused with probability since it is an amalgam of both this probability and the size of the event. If the 1 in 10 chance of a loss is one of making a very big loss indeed, this can be a more risky event than one where the probable gains are exactly the same, but the risk of loss is much smaller." (Pearce 1983 page 287).

paradigm, there are good reasons to query it as the sole basis for the analysis of risk.

First, it is generally acknowledged that the EU model is somewhat restrictive: it imposes an additively separable structure on the utility function that implies strong assumptions about the way individuals perceive choices among alternative prospects. For this reason a number of alternative models – such as rank-dependent expected utility, for instance – have been considered as alternative models of individual preference under uncertainty with consequences for the formulation of risk.[2] Because the notion of risk itself is the product of a specific axiomatisation, in that the axioms relate to the preference structure from which the risk concept is extracted, risk-rankings derived from EU are special. It is clear that even if peoples' preferences do not conform to EU assumptions, they may yet have a coherent perception of risk.

Second, risk can be axiomatised directly, not as a derivation from a model of preference. This is arguably more general than a preference-based approach in that assessments in terms of risk may be considered to have applications over a broad range of distributional comparisons, and not just over situations in which an individual has a personal stake. This direct approach can be illuminated by considering risk in the context of a parallel literature.

2.2 Risk and inequality

There is a historic link between the analysis of economic inequality and that of risk and this link is informative in understanding the issues that are central to this paper.

Some of the early inequality literature uses the well-developed theory of choice under uncertainty and its associated model of risk and transposes the main concepts from one kind of distribution (probability) to another (income or wealth): inequality is just risk in new clothes (Atkinson 1970). The inequality-risk link has been made more formal through explicit axiomatisation, mainly but not only by Rothschild and Stiglitz (1970, 1971, 1973). In addition there is an approach that suggests that social choice among income distributions should be based on a choice amongst lotteries behind a "veil of ignorance" as to one's identity (Harsanyi 1953, 1955) – social aversion to inequality is then explicitly based on personal aversion to risk.

The close relationship between the two fields suggests that some of the research methods that have been applied to investigate further the axiomatic

[2] Kahneman and Tversky (1979) and Kahneman et al. (1982) are perhaps the most famous, but certainly not the only theoretical developments of non expected utility theories.

basis for inequality analysis may also be applicable to risk (Amiel and Cowell 1999). However, the social-welfare theoretic approach to income distribution can further assist in understanding points that we want to investigate in the context of risk. This approach can be briefly summarised as follows.

Suppose $\mathfrak{F}$ represents the set of all income distributions – each member of the set is a univariate distribution function[3] F. The problem is to rank $\mathfrak{F}$ according to criteria that suitably reflect social values: this is done either by using social-welfare functions or inequality measures, and by specifying the characteristics of a class of these functions that make clear what is meant by "suitable." It is conventional to assume:

- A social-welfare function W is endowed with "ethical" properties such as monotonicity and Schur-concavity; perhaps also with "structural" properties such as homotheticity and decomposability.
- Likewise the inequality measure I satisfies the Principle of Transfers (it is Schur-convex) and may be endowed with structure properties that complement those of W.
- For each F in a subset of $\mathfrak{F}$ with given mean μ there is a link between the two concepts, welfare and inequality

$$I(F) = \phi\left(W(F), \mu\right) \tag{1}$$

  where ϕ is strictly decreasing in its first argument.
- The selection of a particular W or I does not depend on an observer's own position in the income distribution. This is implied by, for example, the "veil of ignorance" assumption of Harsanyi.

Clearly, either W or I could be taken as the basic concept and the relationship (1) establishes an equivalence between the class of social-welfare functions and the class of inequality measures.

Now the approach to risk could be characterised in similar terms: $\mathfrak{F}$ would represent the set of all probability distributions relating to some random endowment of income and the problem would be to rank $\mathfrak{F}$ according to criteria that "suitably" reflect individual preferences in the face of uncertainty. This would be done by specifying a class of utility functions or a class of risk measures. In the risk literature the following is usually assumed, explicitly or implicitly:

[3]The support of F is usually taken to be the set of all nonnegative numbers. For any income $x \geq 0$, $F(x)$ represents the proportion of the population less than or equal to x.

- A suitable utility function U is endowed with standard properties such as monotonicity and quasi-concavity. For a conventional EU approach separability and other structural properties are also required. For some applications further structural properties such as constant absolute risk aversion or constant relative risk aversion may also be imposed.

- Likewise the risk measure R satisfies the principle of mean-preserving spreads (MPS) – the counterpart of quasi-concavity for U (Rothschild and Stiglitz 1970).

- For each F in a subset of $\mathfrak{F}$ with given mean μ there is a link between the two concepts, utility and risk

$$R(F) = \phi\left(U(F), \mu\right) \tag{2}$$

  where ϕ is strictly decreasing in its first argument. Once again ϕ establishes an equivalence relation between the class of utility functions and the class of risk measures.

- The selection of a particular R does not depend on an observer's own involvement in the risk.

Each of the points in this list is open to challenge. For example, in the context of the preference-related approach to risk, it is not self-evident that individuals' preferences conform to the EU paradigm;[4] if one examines attitudes to risk – either directly or inferred from preferences – these may violate the MPS principle in some parts of the distribution. Rankings according to U may differ from R-rankings because of a confusion between "better-than" relationships and pure risk comparisons. Moreover, it is possible that individuals' preference orderings over risky choices that directly affect their own personal wellbeing may differ from risk orderings that are applicable to impersonal comparisons, or comparisons involving others (with varying degrees of proximity).

2.3 The approach

A comprehensive study that successfully disentangled the concept of risk *per se* from the language of preference would require the investigation of several key axioms twice over – for the functions U and R defined above. This

[4] For a review of experimental evidence on the EU model and other paradigms of individual decision making see Camerer (1995).

would clearly be demanding. We have a more narrowly-focused agenda that concentrates on some of the key assumptions about risk highlighted in Section 2.2. Specifically, we want to investigate:

1. whether rankings by risk are simply the reverse of ranking by preference over distributions with a given mean;

2. whether risk-rankings respect the MPS principle

3. that risk-rankings are independent of whether the individual is personally involved in the gains/losses associated with the uncertain prospects.

We will pursue this using a methodology that has been established in the context of inequality and social welfare.

3 Experimental Setting

3.1 Methodology – previous experiments

The collection of evidence on the validity of axioms is a central task in the literature on inequality perceptions (Amiel and Cowell 1999), and is also central for answering our previous questions on risk theory. The benchmarks against which the axioms are compared are the perceptions and judgements from ordinary individuals. While stressing the obvious point that the axioms cannot be right or wrong, it is still interesting to know the extent to which the principles used by social scientists are relevant or coincide with the values of individuals.

How is this to be done? Eliciting such preferences or attitudes from economic data is not an easy task, as some of the studies trying to obtain "revealed preferences" from economic aggregates have found. The solution may lie in the field of experimental economics.

The use of experiments in economics has progressed rapidly from relative obscurity to Nobel prize-winning prominence; they are now seen to provide an important source of empirical information as an alternative to market observations, and experiments are now well established in a number of economic applications. They are used, for instance, to analyse behavioural choices where an econometric approach to market outcomes is inappropriate because of lack of data, measurement difficulties or thinness of samples. However, standard experimental approaches concentrate on participatory experiments designed to investigate the way people behave, for instance, in laboratory markets, or in interactions in provision-of-public-goods types of

settings. Although there is a large literature on experimental bargaining and the problem of experimental design in such contexts, similar work on normative economics and the analysis of preferences is still rare. Our aim, as in the inequality perceptions literature, is not to analyse actual behaviour, but to unearth the basic implicit principles that guide individual judgements. With these objectives in mind, traditional experimental settings are unlikely to be useful.

The research programme described in Amiel and Cowell (1999) has developed an original experimental setting to study inequality perceptions and related concepts. Amiel and Cowell (1999), Gaertner and Jungeilges (1999) and Schokkaert and Devooght (1998) are examples of these experimental techniques applied to normative issues. The original approach consists in using questionnaire-experiments to establish the type of assumptions about inequality comparisons implicitly made by the experimental subjects in their choices.

The original experiments on inequality perceptions, whether paper or computer based, shared a set of similar characteristics. Since the aim was the comparison of distributions, the respondents faced a series of pairs of vectors, and were asked to compare them. Typically, respondents were confronted with two sets of distributions, and asked to rank them according to some criteria (more/less unequal, better/worse...). The following section, the "verbal" question, consisted of a long question that enunciated the principle on which the questionnaire was focusing, and provided different versions of the theoretical principles underlying the choices between distributions. Respondents had to choose which option (if any) they agreed with. All this was done with a fictional underlying story (for instance, policy options in some non existent country), and the fact that there were no correct answers was stressed to encourage pure statement of preferences. Section 3.2 and the Appendix contain a detailed description of our specific setting.

An important feature of these experiments was that there was not one but at least two versions of each, with the same income distributions and the same type of verbal question; the difference was that while half of the copies were asking questions in terms of what was "more unequal", the other half would be termed, for instance, "riskier" (for *inequality-risk* experiments) or "better" (for *preference-inequality* experiments). See Amiel and Cowell (1999, 2002) for a complete set of questionnaires and a lengthy discussion of their administration.

The questionnaire approach has provided important insights on the issues discussed above, namely, (a) whether or not standard assumptions made in the formulation of distributional orderings are appropriate, and (b) the factors accounting for systematic differences between certain groups of persons

in their attitudes on issues such as inequality, poverty and social welfare. We aim to establish whether these insights also apply to the theory of risk.

Results from previous studies have found rejections of some of the basic inequality axioms, which sometimes respond to specific patterns. For instance, Amiel and Cowell 1999 find that while studying economics and being male increases the likelihood of responses being consistent with economic orthodoxy, other background variables such as income, political attitudes and age are relatively unimportant.

In the light of these results, obtained with experiments exploiting the analogies between risk and inequality, our research question becomes all the more relevant. Using the methodology developed for the inequality field, we will focus on the question – what is the meaning of risk comparisons?

3.2 The experimental setting

As discussed above, a specific model of preference – expected utility – is usually taken as the vehicle for the microeconomics of choice in the face of uncertainty. However, there are alternative possibilities – potentially "appropriate" axiom structures – for representing risk comparisons. Our experiment aims to distinguish fundamentally different patterns of risk comparisons.

Our setting for the study of risk draws from these original designs, but also contains a series of innovations. While the underlying vectors and questions are similar, our research implied a higher level of involvement from the individual respondents. In previous experiments, the judgements about the whole society required some form of "Olympian detachment", but in terms of risk, the individual's perceptions required him or her to be involved. Given that our respondents were students, we decided to ask our questions in terms of potential jobs. The vectors of incomes would not represent the distribution of income in a society, but the earning possibilities of two different jobs.

However, how close should the individual be? Should the hypothetical situation refer to him/herself, or to someone close? To analyse the effect of the level of involvement, we study the issue of whether individuals would recommend the same prospects for themselves or for a friend.[5]

The experiment, then, follows the structure of previous studies (Section 3.1), consisting of six numerical questions and one verbal question. Our experiment is an extension of the original setting by Amiel and Cowell (2002), focusing on the three specific issues highlighted in Section 2.3.

Regarding the specific issue of whether risk-rankings respect the MPS principle, we adopted for the numerical questions the same income vectors as

[5] We owe this variation of the experiment to a suggestion by Yoram Amiel.

Amiel and Cowell (2002).[6] For each pair of vectors, the first can be obtained from the second by a mean preserving spread, and thus the agreement of the respondent with the MPS principle can be easily deduced.

Dealing with the other two points raised (whether rankings by risk are simply the reverse of ranking by preference over distributions with a given mean, and whether risk-rankings are independent of personal involvement by the individual), however, is not self-evident. Ideally, one would like to ask to the same person similar questions in terms of riskiness and preference, and with and without involvement, to test whether any of these two issues make a difference with respect to the nature of risk perceptions and judgements. Clearly, it is not possible to do this, since asking the same or very similar questions would bias the respondent's answers. We thus adopted the randomisation procedure described in the previous section and in Amiel and Cowell (2002). While we cannot ask similar questions to the same respondent, we can still assign different types of questionnaires at random. With a sufficiently large and carefully selected sample, we can test whether different questionnaire formats matter for answers to questions with the same underlying structure. We are thus able to examine the structure of both types of comparison (risk/preference rankings, and personal involvement) simultaneously with the procedure outlined below.

We use four similarly structured versions of the questionnaire. There is a randomisation between the *risk* and *preference* types of questionnaire, and also with respect to the way in which the questions are phrased: respondents are asked to choose a job for themselves, or alternatively which option they would recommend to a friend. This results in four types of questionnaires, with categories defined as follows:

- *Friend/Self*: the questionnaires ask about a prospective job offer to be considered by the respondent (*self*), or for advising a friend (*friend*).
- *Risk /Preference*: in the numerical questions, the options are labeled "More risky" (*risk*) or "Better" (*preference*).

The Appendix contains a template of the full questionnaire, with the content of the verbal question as well.[7] We reproduce here the first numerical question and its introductory blurb in the four formats:

[6] The differences in the fictional prospective incomes are relatively large. While this may be considered unrealistic, we believe there is an implicit contract between the researcher and the experimental subject about the fictional nature of the setting.

[7] The four versions are also available online: http://darp.lse.ac.uk/types.htm

Risk-Self: *"Below are two alternative lists of incomes A and B (in the same currency). Each list represents the five possible outcomes of the A-job or the B-job respectively after you have accepted it. Please state which you consider would result* in higher risk *for yourself by clicking the appropriate button."*

Preference-Self: *"Below are two alternative lists of incomes A and B (in the same currency). Each list represents the five possible outcomes of the A-job or the B-job respectively after you have accepted it. Please state which you consider would* be better *for yourself by clicking the appropriate button."*

Risk-Friend: *"Below are two alternative lists of incomes A and B (in the same currency). Each list represents the five possible outcomes of the A-job or the B-job respectively after your friend has accepted it. Please state which you consider would result* in higher risk *for your friend by clicking the appropriate button."*

Preference-Friend: *"Below are two alternative lists of incomes A and B (in the same currency). Each list represents the five possible outcomes of the A-job or the B-job respectively after your friend has accepted it. Please state which you consider would* be better *for your friend by clicking the appropriate button."*

A (2, 5, 9, 20, 30)
B (2, 6, 8, 20, 30)

- *A more risky / A better*
- *B more risky / B better*

Apart from the differing introductions from the numerical questions and corresponding differences in wording of the verbal question, all the questionnaires are exactly the same. The experiments are implemented on the Internet (see Section 3.3 below). After logging on to the questionnaire site, the respondent is presented with a general preamble, followed by an explanation about the format of the numerical questions. The preamble stresses the fact that there are no right or wrong answers, and that the researchers are interested solely in the respondent's judgements and preferences. The six following windows correspond to the numerical questions. A brief text then explains the background to the verbal questions, which consists of a set of pre-defined multiple choice answers and a box for the user to complete. Finally, there are two sets of questions about the respondent's background

and characteristics, followed by a page thanking the respondent for his/her participation in the experiment.

The Appendix contains images of the screens presented to the respondents, with the whole text of the setting and the questions. There is also a "live" demonstration of the experiment accessible through the World Wide Web.[8]

3.3 Beyond paper based questionnaires: the Virtual Laboratory approach

Most of the empirical work described in Section 3.1 used paper questionnaires and worked with student samples (see for instance Amiel 1999; Amiel and Cowell 1999). The general form of these experiments has been as follows:

- Respondents are asked numerical and/or verbal questions about alternative distributions in carefully specified hypothetical environments.
- Internal controls for consistency of responses are incorporated in the question design.

For this study, we developed an extension of the original methodology that supersedes the paper based "questionnaire experiments". At the core of the research is a new Internet-based technology, the Virtual Laboratory, a facility for designing and running questionnaire experiments. The motivation of the Virtual Laboratory is three-fold: (a) individual respondents can participate remotely; (b) interaction with the Web-server is designed in a way that allows observation of the process of reaching decisions as well as final judgments; (c) researchers at remote locations can develop and redesign experiments and download results automatically.

It still has to be established whether the format of the questionnaire (paper or electronic) has any effect on the nature of the results. Whereas the present experiment was only administered electronically, ongoing research is seeking to establish if there is any kind of bias using the R4A4 experiment (see for instance Amiel 1999; Amiel and Cowell 1999) for which both paper based and electronic questionnaires are available.[9]

[8] It can be accessed by following the link:
http://darp.lse.ac.uk/test/0302b/start.asp
Note that since this is the same version administered to our respondents, the resulting questionnaire will be one of the four versions described above, chosen at random by the web server. To see each of the four different versions, please use the following link:
http://darp.lse.ac.uk/types.htm

[9] An example of the original experiment from Amiel and Cowell (2001), can be found at http://darp.lse.ac.uk/experimentdemo.htm

We now turn the nature of our sample and present our results.

4 Data and Results

4.1 Characteristics of the respondents

4.1.1 Selection of the sample

The questionnaire experiment was administered to a sample of ninety-two LSE students during the academic years 2001/2002 and 2002/2003. The students were mostly undergraduates from Economics and other social sciences.

Considering the choice of the respondent sample and the mechanisms to induce participation, there are two main issues in experimental economics: the source of participants, and the incentives to participate.

Regarding the participants, whereas we make intensive use of Internet technology, we did not want to have a respondent base drawn from the random flow of Internet users. For that reason, we limited our sample by contacting our own students by email, briefly explaining in general terms the purpose of the research and giving them a URL to follow. This ensured a relatively high quality of responses, which in our view is far more important than a potentially large sample size with low quality responses. The issue of whether students are representative of the population and the need to extend the respondent base beyond universities is left for further research.

On the other hand, incentives (and, especially, remuneration linked to experimental outcomes) are seen as highly important in market-based experiments to ensure that participants will put in effort and behave rationally. In our setting, however, there are no correct answers, and this type of incentive is not necessary. However, we set up a random draw of 25 GBP as a way to motivate the student's participation in the experiment. While it might be argued that this lottery would attract students with biased preferences over risky prospects, the results outlined below are roughly consistent with previous findings obtained in non remunerated experiments and questionnaires.

4.1.2 The respondent sample

Table 1 contains summary statistics of the respondents' characteristics collected at the end of the questionnaire. As can be expected from a group consisting mainly of undergraduate students, the average age is only 20.2 years, with 82% of respondents between 18 and 21 years old. The sample contains a majority of males (58%), which reflects the composition of the courses in which the experiments were administered. A relatively high 41%

Table 1: Characteristics of respondents

Characteristics Variable	Obs	Mean	σ	Min	Max	PV Risk	PV Fr.
Age	87	20.24	2.12	18	31	0.329	0.372
Females	92	42%	0.5	0	1	0.736	0.422
Employed	92	41%	0.5	0	1	0.571	0.806
Family inc. (1-7)	85	4.5	1.12	2	7	0.913	0.971
Inc. prospect (1-7)	84	5.2	0.92	2	7	0.173	0.780
Subject=Econ.	92	63%	0.49	0	1	0.837	0.874
Pol. Views (1-7)	85	4.1	0.95	2	6	0.433	0.515
Left	92	21%	0.41	0	1	0.867	0.719
Right	92	30%	0.46	0	1	0.447	0.317

of the students declared themselves to have been employed, though given the nature of their degrees this probably refers mostly to part time jobs. Regarding the subject of study, 63% of the respondents follow an economics degree (or a mixed economics degree - i.e., "Economics and Finance", etc.). In terms of political views, respondents were asked to classify themselves in a one to seven scale, where four represented the centre, lower values the left and higher values the right. The mean of this variable, 4.1, suggests that the sample is relatively balanced with respect to political views.

Finally, for a set of reasons (privacy, the international nature of the sample, avoiding missing answers from indiscreet questions), students were not asked about their current incomes, but instead were required to classify their family incomes in 1990 and their expected future income in 2010 in a one to seven scale (one being poor and seven rich). We can see that our group of respondents are relatively optimistic about the future, with a mean of past family income of 4.5 and future income of 5.2.

These characteristics are the main controls that will be used in the analysis of the results.

4.1.3 Types of questionnaires

As explained in Section 3.2, our experiment consists of four different types of questionnaires from the mix of *friend/self* and *risk/preference* categories. In order to make inferences about the relevance of these categories for the experiment's answers, we must verify that there was no bias in the assignment of the respondents.

Reassuringly, the evidence confirms that the sample is well balanced among categories. The questionnaires were assigned randomly to the stu-

Table 2: Types of questionnaires

Type of Questionnaire	Respondents	%
Preference-Self	25	27.17%
Preference-Friend	17	18.48%
Risk-Self	20	21.74%
Risk-Friend	30	32.61%
Total	*92*	*100%*

dents by a computer handled randomisation which worked correctly. While we can observe in Table 2 that there are relatively more *risk-friend* and less *preference-friend* questionnaires, this is mostly due to the small size of the sample (simulations with the Virtual Laboratory show that increasing the number of questionnaires would result in a convergence of 25% for each category). Most importantly, Table 1 contains the p-values of t-tests of differences in means in respondent characteristics between the *risk* and *preference* and the *friend* and *self* questionnaires. As can be appreciated in the table, none of the differences are even barely significant at the standard levels, confirming that the allocation of questionnaires was truly random.

4.2 Results

4.2.1 Numerical questions

As explained above, in the numerical questions the respondents were asked to choose between two vectors of possible outcomes. Table 3 presents the results for the total number of questions answered (523) from the groups of 90 respondents with complete characteristics. It should be stressed that in the *risk* questionnaire, the choice of option A ("A more risky") corresponds to the agreement with the MPS principle, while in the *preference* questionnaire this "orthodox" view is represented by the choice of option B ("B better"). This is because in all numerical questions the vector represented by A is obtained from B by a mean preserving spread (see Section 3.2). We will present the answers in terms of options A, AB and B in this first table, but for the rest of the document we will reclassify the answers and deal with categories defined as agreement/indifference/disagreement with the MPS principle.

From this table we can extract some preliminary conclusions. While agreement with the MPS principle is high, it seems to be higher for the risk questionnaire (61.3 versus 55.9% of the answers). While the t-tests of this difference (not reported) are not significant at the 5% level, the differences in the indifference and rejection rates of the MPS are strongly significant (28.2%

Table 3: Answers by type of questionnaire

Risk Answers	**Friend**	%	**Self**	%	**Total**	%
A	106	63.1%	70	58.8%	176	61.3%
AB	44	26.2%	37	31.1%	81	28.2%
B	18	10.7%	12	10.1%	30	10.5%
Total	*168*	*100%*	*119*	*100%*	*287*	*100%*

Preference Answers	**Friend**	%	**Self**	%	**Total**	%
A	32	31.7%	24	17.8%	56	23.7%
AB	19	18.8%	29	21.5%	48	20.3%
B	50	49.5%	82	60.7%	132	55.9%
Total	*101*	*100%*	*135*	*100%*	*236*	*100%*

vs. 20.3%, and 10.5% vs. 23.7% , for *risk* and *preference* respectively). However, the small differences in answers between the *self* and *friend* versions do not appear to be significant at standard levels. We will return to this point when dealing with the multivariate analysis.

Full agreement with the principle requires a simple but strict pattern of responses: "AAAAAA" in the case of *risk,* and "BBBBBB" in the case of *preference*. The subsample adopting this "pure" form of response is sparse: *preference-self*: 5 respondents, *preference-friend*: 1 respondent, *risk-self*: 3 respondents and *risk-friend*: 9 respondents.

Because of this sparseness, in the following tables we have re-classified the answers in three categories as explained above (agreement / indifference to / disagreement with the MPS). Rather than conducting the analysis at the level of individual questions, we aggregated the answers by respondent, assigning them to one category only if 50% or more of the answers corresponded with one of these categories.

With this new definition, we can observe in Table 4 that around 68% of the respondents agree with the MPS principle. However, a non-negligible 32% does not accept it (weakly and/or strongly), and in the case of strongly rejecting it, it was much more important for questions asked in terms of preference (21%) than risk (4%).

Table 5 presents information about the same reclassification, but this time breaking down answers by *self* or *friend* questionnaires. It appears that there is a much higher probability of a strong rejection of the MPS if the questionnaire was of the *friend* type (17%) than the *self* (7%).

Table 4: Answers by type of questionnaires - risk

Answer	Preference	Risk	Total
Disagreement w/MPS	21%	4%	12%
Indifference	13%	26%	20%
Agreement w/MPS	66%	70%	68%
Total	*100%*	*100%*	*100%*
N	*38*	*46*	*84*

Table 5: Answers by type of questionnaire-self

Answer	Self	Friend	Total
Disagreement w/MPS	7%	17%	12%
Indifference	23%	17%	20%
Agreement w/MPS	70%	66%	68%
Total	*100%*	*100%*	*100%*
N	*43*	*41*	*84*

Finally, Table 6 presents the same information but broken down by the four types of questionnaires. Not surprisingly in the light of previous comments, the "preference-friend" type has the highest strong rejection rate (33%), while no "disagreement" with the MPS principle occurring in the "risk-self" case. This is important because this case is perhaps the most standard way of presenting the question. Of course, this is due to the reclassification of the results that amalgamate the answers to six questions into one category: in Table 3, we can observe that there were as many as 30 answers (from a total of 523) rejecting the MPS principle in the *risk-self* category.

After these basic results, we present a multivariate regression analysis that allows us to control not only for the type of questionnaire, but also for individual characteristics of the respondents.

4.2.2 Multivariate analysis of numerical questions

The question immediately arises whether the type of question remains an important determinant of heterodox responses once we control for personal characteristics of the respondents. We are also interested in knowing if any of these characteristics have a systematic effect on answers. To address this issue we use a standard probit regressions of the form:

$$\Pr(\text{Response Pattern}) = \Phi(b_1 y_1 + b_2 y_2 + ... + b_n y_n) \tag{3}$$

where y_j is a measure of personal or background characteristic j, $(b_1, ..., b_n)$ is a vector of coefficients and Φ is the normal distribution function. Given

Table 6: Answers to numerical questions

Num. Questions	**Pref.-Self**	**Pref.-Fr.**	**Risk-Self**	**Risk-Fr.**	**Total**
Disagr. w/MPS	13%	33%	-	8%	12%
Indifference	17%	7%	30%	23%	20%
Agreement w/MPS	70%	60%	70%	69%	68%
Total	*100%*	*100%*	*100%*	*100%*	*100%*
N	*23*	*15*	*20*	*26*	*84*

that there were m separate numerical questions (where $m = 6$ in our case) there are two main interpretations of "Response Pattern" in (3) of particular interest to us:

1. We first look at a single response pattern which we defined as a majority of answers in agreement / indifference to / disagreement with the MPS principle, in which case we have N observations.

2. We then turn to the analysis of the m separate responses (each of which could be agreement / indifference to / disagreement with the MPS). This gives us mN observations; however, since we have repeated observations for each respondent, we will cluster the observations by respondent. Not doing so would introduce a spurious downward bias in the coefficient's standard errors.

Table 7 and Table 8 display the results of these two interpretations, reporting the marginal effects at the mean of the dependent variable.[10] The three dependent variables are coded as one for agreement / indifference / disagreement with the MPS; as explained above, in Table 7 we refer to a *majority* of answers of a certain type, while in Table 8 we consider every answer individually. The dependent variables are age, political opinion coded as left and right (smaller or greater than 4, the centre value), and dummies for gender (1 for male), work status and economic subject.[11] Moreover, we control

[10] The "marginal effect" in these tables and elsewhere is interpreted as follows. Let P denote the relevant probability on the left-hand side of (3). Then, given the probit model, it is clear that for the ith explanatory variable, the marginal impact of an increase in y_i on the probability is proportional to the coefficient b_i thus:

$$\frac{dP}{dy_i} = b_i \, \varphi \left(\sum_j b_j y_j \right)$$

where $\varphi(\cdot)$ is the normal density function.

[11] The variables income rank in 1990 and income rank in 2010 were not included in the regressions because they were not significant in any of the specifications, and caused

whether the respondent answered a *risk* or *preference* questionnaire (with the indicator *risk* being one), and *self* or *friend* (with one corresponding to the *self* case).

Table 7 contains interesting results regarding both individual characteristics and type of questionnaire. Firstly, none of the variables seem to have any effect on the probabilities of agreeing or being indifferent to the MPS. However, there are strongly significant determinants of the disagreement indicator. Regarding personal characteristics, it is interesting to note the lack of any gender effect or any effect from pursuing an economics degree, which had been identified as important factors in previous research. Being older has a negative and significant effect on the probability of disagreeing with standard economic theory, which may be proxying for the small subset of postgraduate students in our sample who have been more exposed to the standard axioms of economic theory. Finally, being employed or at the left of the political spectrum significantly increases the probability of the respondent having a point of view not consistent with standard economic assumptions.

Regarding the type of questionnaires, the Risk type clearly reduces the probability of disagreement with the MPS; the Self type also reduces this probability, but the level of significance of this coefficient is much lower.

The results in Table 8 correspond to the case in which we consider the answer to all questions. This allows us to increase significantly the number of observations and thus precision (although as stated above we control for repeated observations by clustering on individual respondents – observations from the same person are not considered independent in the regression), and avoids the biases that might be introduced by the aggregation procedure we used for the previous table, which is arbitrary up to a certain point. This regression also includes controls for each of the six numerical questions, since they imply different mean preserving spreads and thus we can expect respondents to evaluate them differently.

We notice again that none of the variables on questionnaire type or individual characteristics seem to have any effect on the probabilities of agreeing or being indifferent to the MPS (except for a barely significant effect from "right" in the indifferent case). But again, we find strong predictors of the "heterodox" position. There is now a slightly significant effect of gender, with males having a higher probability of answering in a conventional way. Being older again has a negative and significant effect on the probability of disagreeing with standard risk theory, while being employed has a positive and significant effect on heterodoxy. Finally, there is no effect from pursuing

colinearity problems in some of the regressions. The results were not qualitatively altered by this omission.

Table 7: Probit Results, Numerical Questions – Aggregated Responses

	Disag. w/MPS		Indifferent		Agrees w/MPS	
Male	-0.0428	[1.24]	0.0428	[0.47]	0.0069	[0.06]
age	-0.0267	[1.93]*	0.0071	[0.32]	0.0246	[0.82]
Risk	-0.1241	[3.64]***	0.1433	[1.62]	0.0405	[0.37]
Self	-0.0608	[1.79]*	0.1034	[1.25]	0.032	[0.30]
employed	0.1028	[2.59]***	-0.0117	[0.12]	-0.168	[1.42]
left	0.1604	[2.05]**	-0.1539	[1.49]	0.0617	[0.45]
right	0.0117	[0.31]	-0.0741	[0.76]	0.1291	[1.08]
econ	0.0284	[1.07]	-0.0293	[0.30]	-0.0364	[0.33]
Pseudo R^2	0.316		0.077		0.035	

Notes:

N=83

Level of significance: *10%, **5%, ***1%

Robust z statistic in brackets,

Except for age, $\frac{dF}{dx}$ is for discrete change of dummy from 0 to 1

Table 8: Probit Results, Numerical Questions – All Responses

	Heterodox		Indifferent		Orthodox	
Male	-0.0656	[1.65]*	-0.0003	[0.00]	0.0838	[1.09]
age	-0.0283	[2.25]**	-0.0165	[0.79]	0.04	[1.48]
Risk	-0.1445	[3.80]***	0.0938	[1.58]	0.072	[0.98]
Self	-0.0598	[1.63]	0.0472	[0.81]	0.0333	[0.45]
employed	0.07	[1.77]*	0.0152	[0.22]	-0.0993	[1.14]
left	-0.0158	[0.30]	-0.0337	[0.45]	0.0514	[0.52]
right	0.0065	[0.17]	-0.1341	[1.88]*	0.1318	[1.54]
econ	0.0402	[1.13]	-0.0049	[0.07]	-0.0455	[0.58]
Question 2	-0.0836	[2.15]**	0.383	[6.09]***	-0.2585	[4.32]***
Question 3	-0.0278	[0.84]	0.0807	[1.94]*	-0.0284	[0.56]
Question 4	0.0194	[0.46]	-0.0795	[1.26]	0.0375	[0.63]
Question 5	-0.1187	[2.67]***	-0.0094	[0.15]	0.1864	[2.53]**
Question 6	-0.0398	[1.02]	0.1877	[3.59]***	-0.1112	[1.94]*
Pseudo R^2	0.145		0.124		0.09	

Notes:

N=517

Level of significance: *10%, **5%, ***1%

Robust z statistic in brackets, clustered by respondent

Except for age, $\frac{dF}{dx}$ is for discrete change of dummy from 0 to 1

an economics degree or from political views.

As in the previous regressions, the Risk case clearly reduces the probability of non standard answers, while the small effect of the Self questionnaire we noticed in the previous table now disappears.

We now turn to the analysis of the verbal question.

4.3 The verbal question

4.3.1 Descriptive analysis

The question itself is very similar to the ones used in previous studies on perceptions of inequality. Respondents face a set of statements, and they have to choose which correspond to their views - multiple selections are allowed. There are five possible responses, including "none of the above". The choice of these responses was designed to cover the views corresponding to the MPS principle. Individuals are allowed to check more than one response, and only response "d" is consistent with the standard risk theory view.

Table 9: Answers to verbal question

Answer	Freq.	Percent
a	10	11.49
ac	3	3.45
ad	1	1.15
ab	2	2.3
b	25	28.74
bc	2	2.3
c	14	16.09
cd	2	2.3
d	16	18.39
e	12	13.79
Total	*87*	*100*

The fact that respondents were allowed to make multiple selections from question 7 means that we can interpret consistency with economic orthodoxy in either a broad or narrow sense. On the narrow interpretation – whether for *preference* or for *risk* questionnaires – people should have checked "d" and nothing else. However, it might be reasonable to look at cases where, because of difficulties with understanding the question, or some perceived ambiguity, respondents checked both "d" and one or more other possibilities.

We can see in Table 9 that 19% chose the orthodox answer, and less than 22% chose this option or this option combined with some other. These

Table 10: Probit Results – Verbal Question

	Heterodox	
Male	0.1694	[0.0986]*
age	-0.0484	[0.0234]**
Risk	-0.0235	[0.0795]
Self	0.0086	[0.0847]
employed	0.2014	[0.0828]**
left	0.0155	[0.1083]
right	-0.1511	[0.1158]
econ	0.0307	[0.0966]
Pseudo R^2	0.105	

Notes:
N=87
Level of significance as in previous tables
Robust z statistic in brackets
Except for age, marginal effects for dummies

numbers were higher in the case of Risk and Friend questionnaires (not reported). Support for the pure MPS seems to be very low when spelled out directly.

We now turn to a brief regression analysis of the determinants of answers to the verbal question.

4.3.2 Regression analysis

Let us look once again at the role of personal factors on the response to the verbal question using probit regressions. Table 10 presents the results of a probit estimation of a model like (3), using the same independent variables as in the two previous regression tables. The dependent variable, in this case, is an indicator that takes value one if the respondent did not choose option "d" or option "d" combined with some other choice in the verbal question.

Employment and age continue to be significant, with the same signs as before. The indicator for male respondents is again significant, but in this case with a positive (though not highly significant) coefficient: in the verbal question, being male increases the chance of a non-orthodox response. Finally, political opinion and economics subject are not significant.

Regarding the type of questionnaire, this table indicates that there does not seem to be any type of questionnaire effect on answers to the verbal question.

4.4 Comparison with previous results

While Amiel and Cowell (2002) find persistent evidence of an "orthodox" effect from studying an economic subject in inequality comparisons, in the case of risk we do not find any significant effect from this individual characteristic. This may be an artefact of the sample selection in this case: the LSE students approached were either economics specialists or pursuing courses that have a high economics component.

They also found that being male had similar impact – more conventional numerical responses; in our case, we find the same for the numerical questions, although for verbal questions this result is reversed (males appear to be more heterodox than females).

5 Conclusions

By means of our questionnaire experiments, we find evidence that a minority of respondents do not respect the principle of mean-preserving spreads in their risk-rankings. Moreover, we find some evidence that rankings by risk are **not** simply the reverse of ranking by preference over distributions with a given mean. Comparisons in terms of preference seem to induce a higher proportion of disagreement with the MPS for similar underlying questions.

However, we find significant evidence that risk-rankings are independent of whether the individual is personally involved in the gains/losses associated with the uncertain prospects, at least as far as our experimental setting is concerned. Finally, we also find that there is almost no effect in the response pattern from the "gender" of the respondent, or the fact that he/she is studying economics.

The results we obtained are broadly consistent with previous work done with paper questionnaires on risk and inequality. Future work will focus on significantly increasing the sample to test the robustness of our findings.

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Appendix 1 – Sample Questionnaire

This appendix contains a sample questionnaire. Following is the sequence of screens seen by a respondent who completed the *risk-friend* type of questionnaire. We prefer to use these images rather than the text to give the reader an idea of the whole "look and feel" of the questionnaire. A "live" version of the questionnaire is available on the World Wide Web and can be found at:

http://darp.lse.ac.uk/test/0302b/start.asp

The questionnaire below corresponds to the *risk/self* category. The other categories are defined as follow:

- *Friend/Self*: the questionnaires ask about a prospective job offer to be considered by the respondent (*self*), or for advising a friend (*friend*).
- *Risk / Preference*: in the numerical questions, the options are labeled "More risky" (*risk*) or "Better" (*preference*).

Please note that the "live" version will randomise between the four types of questionnaire available. To see a particular version, please follow the URL:

http://darp.lse.ac.uk/types.htm

Apart from these different categories, all the questionnaires are exactly the same. After logging, the respondent is presented with a general preamble about the questionnaire, followed by an explanation about the numerical questions. The six following windows correspond to the numerical questions. A brief text explains the background to the verbal questions, which consists in a set of pre-defined multiple choice answers and a box for the user to complete. Finally, there are two sets of questions about the respondent's background and characteristics, following by a page thanking the respondent for participating in the experiment.

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

RISK QUESTIONNAIRE

This questionnaire concerns people's attitude to the risk associated with income prospects. We would be interested in **your** view, based on hypothetical situations. Because it is about attitudes there are no "right" answers. Some of the possible answers correspond to assumptions consciously made by economists: but these assumptions may not be good ones. Your responses will help to shed some light on this, and we would like to thank you for your participation.

The questionnaire is in three parts. Parts 1 and 2 each consist of a brief background "story" and then some questions. The third part is a request for some information about yourself. The whole questionnaire will probably take you about 10 to 15 minutes to complete.

The questionnaire is anonymous.

Click here to start: [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:
- Introduction

RISK QUESTIONNAIRE

Background to Part 1

You are considering a choice between two job offers A and B. The monetary payoff to either job offer is not known with certainty. In job A or job B you could, with equal probability, be assigned to any one of five different positions with known incomes. Apart from the income prospects you believe the jobs to be equally attractive.

In each of the following six questions two alternative lists of incomes A and B (in the same currency) are given. Each of these pairs represents the outcomes of the A-job and the B-job in terms of the monetary rewards in each of the five possible positions. In each case please state which job offer you consider would present the higher risk.

Click here for the questions: [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:
- Introduction
- Alfaland

RISK QUESTIONNAIRE

Below there are two alternative lists of incomes A and B (in the same currency). Each list represents the five possible outcomes of the A-job and the B-job respectively after you have accepted it.

Please state which policy you consider would result in higher risk for yourself by clicking the appropriate button...

A (2, 5, 9, 20, 30)

B (2, 6, 8, 20, 30)

A more risky ○
B more risky ○
Same risk in A&B ○ [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:
- Introduction
- Alfaland
- question 1

RISK QUESTIONNAIRE

Here is question 2. Again, this pair represents the five possible outcomes of the A-job and the B-job after you have accepted it. Indicate which you consider would result in higher risk for you by selecting A or B

A (2, 5, 9, 20, 30)

B (3, 5, 9, 20, 29)

A more risky ○
B more risky ○
Same risk in A&B ○ [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:
- Introduction
- Alfaland
- question 1
- question 2

RISK QUESTIONNAIRE

Question 3 is in exactly the same format. Please indicate which job-offer seems to present the higher risk.

A (2, 5, 9, 20, 30)

B (2, 6, 9, 20, 29)

A more risky ○
B more risky ○
Same risk in A&B ○ [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:
- Introduction
- Alfaland
- question 1
- question 2
- question 3

RISK QUESTIONNAIRE

Same again for question 4:

A (2, 5, 9, 20, 30)

B (2, 9, 10, 15, 30)

A more risky ○
B more risky ○
Same risk in A&B ○ [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:

- Introduction
- Alfaland
- question 1
- question 2
- question 3
- question 4

RISK QUESTIONNAIRE

Question 5:

A (10, 10, 10, 10, 30)

B (10, 10, 10, 20, 20)

A more risky ○
B more risky ○
Same risk in A&B ○ [OK]

Questionnaire - Microsoft Internet Explorer provided by Virgin.net

Navigation...

Use this panel if you want to return to previous pages to check your response.

To move on through the questionnaire use the [OK] button.

Go back to:

- Introduction
- Alfaland
- question 1
- question 2
- question 3
- question 4
- question 5

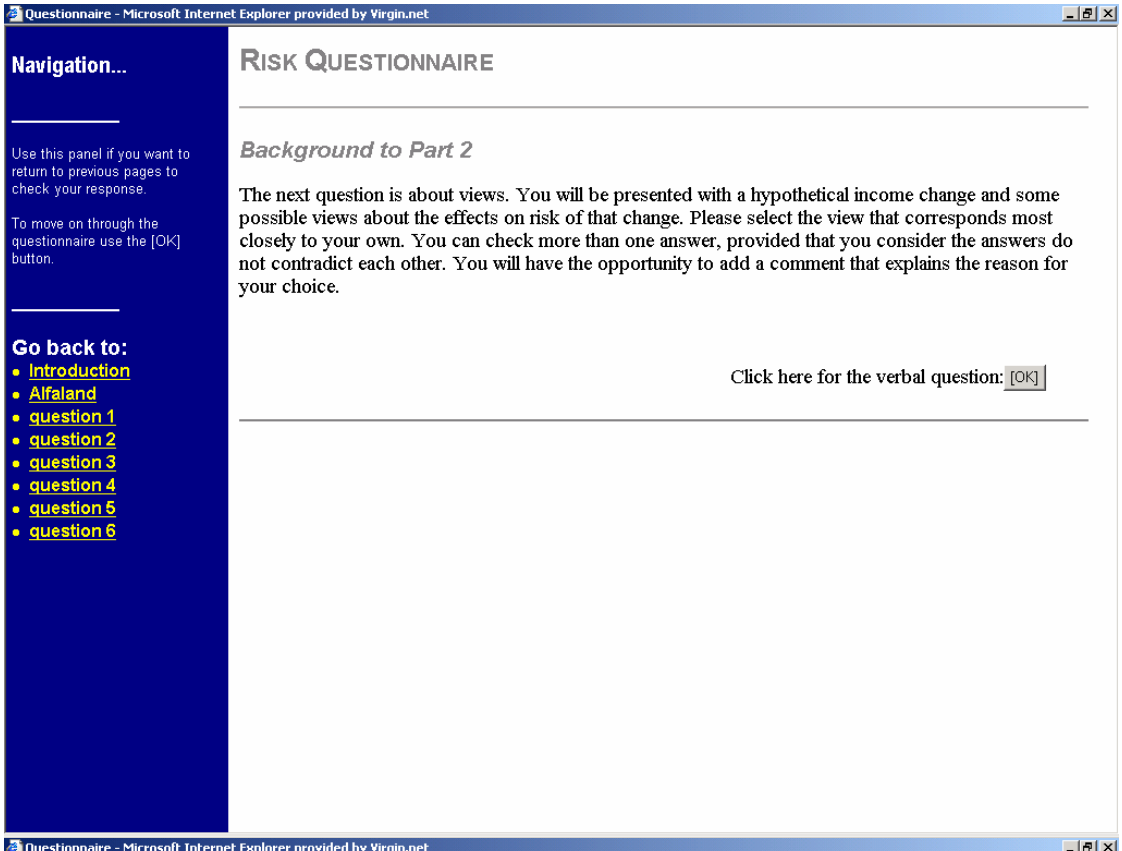
RISK QUESTIONNAIRE

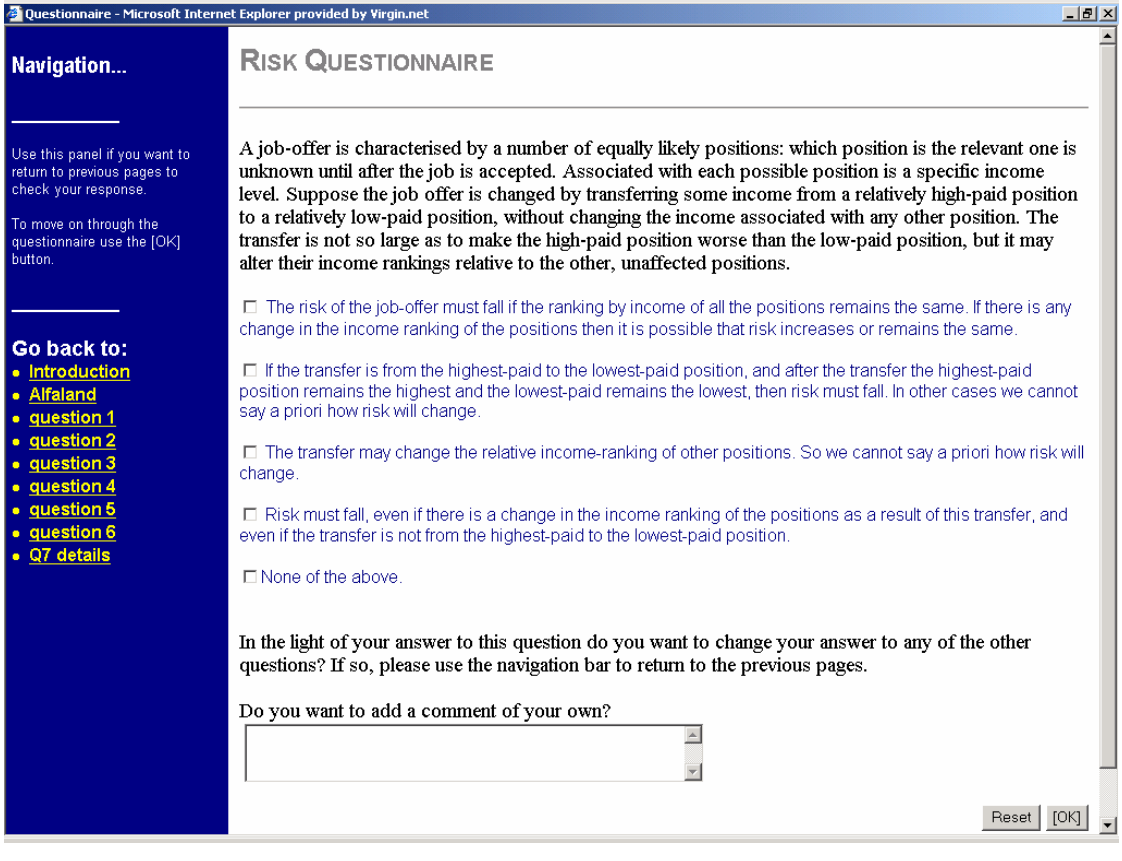
Question 6 is the last of the questions in Part 1:

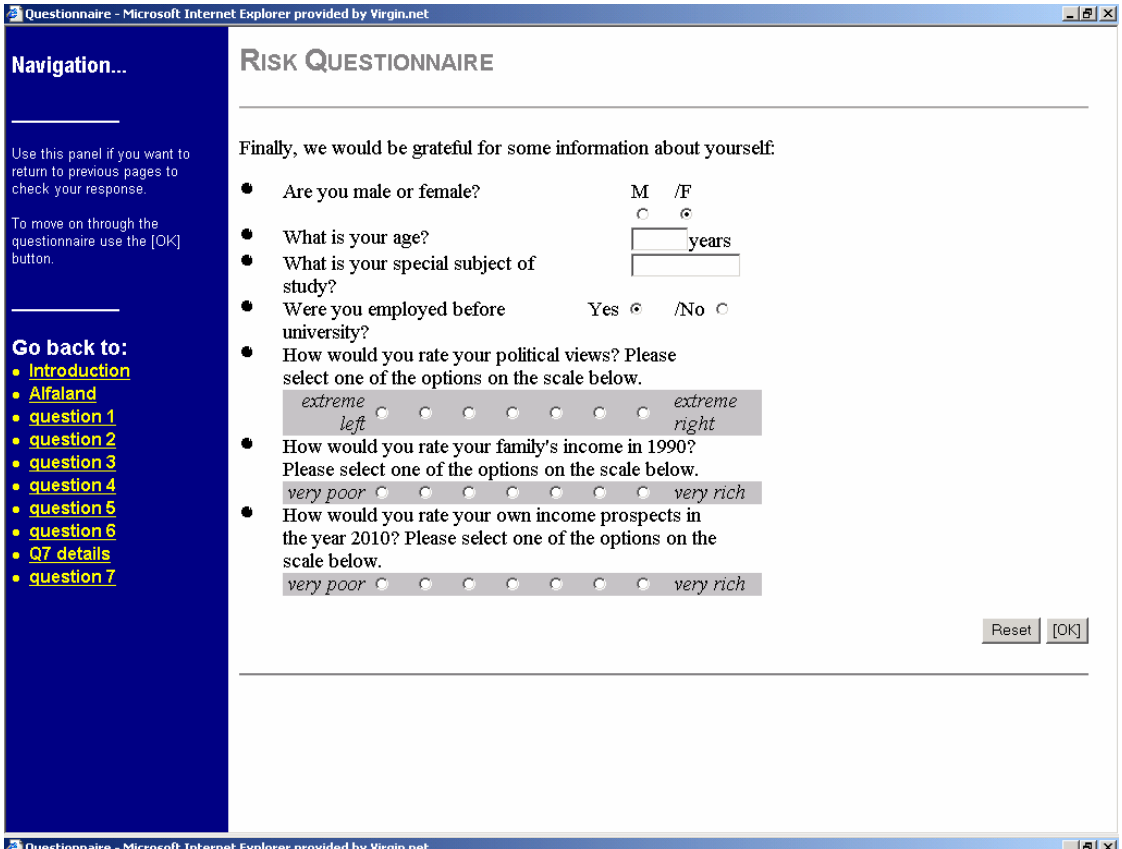
A (2, 5, 9, 20, 30)

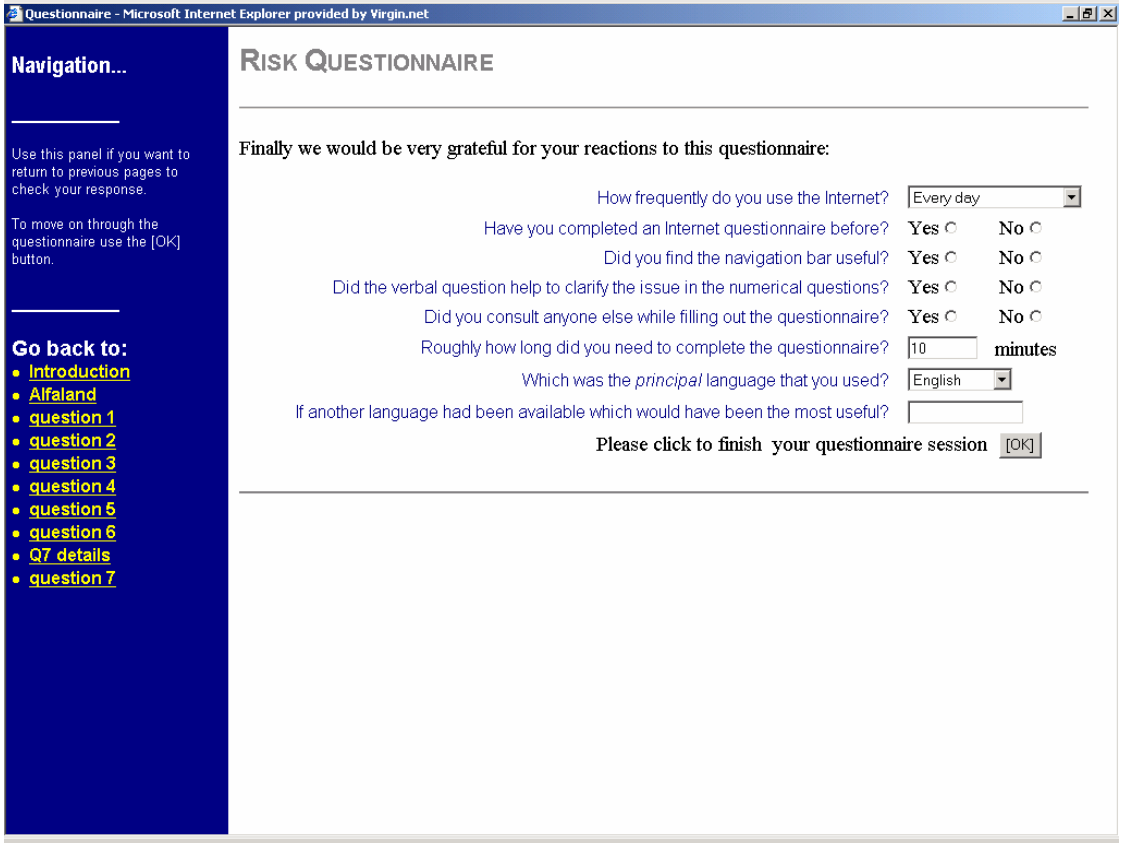
B (2, 6, 9, 19, 30)

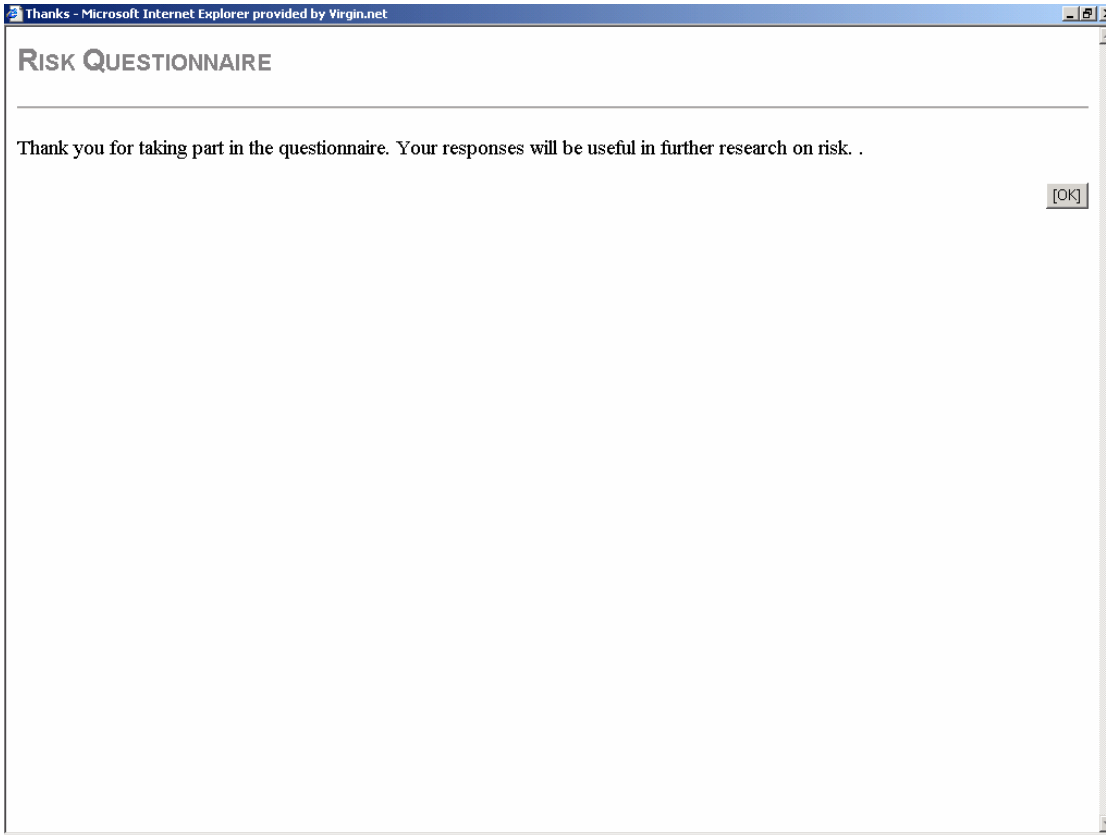
A more risky ○
B more risky ○
Same risk in A&B ○ [OK]


Questionnaire - Microsoft Internet Explorer provided by Virgin.net
Navigation...
Use this panel if you want to return to previous pages to check your response.
To move on through the questionnaire use the [OK] button.
Go back to:
Introduction
Alfaland
question 1
question 2
question 3
question 4
question 5
question 6
RISK QUESTIONNAIRE
Background to Part 2
The next question is about views. You will be presented with a hypothetical income change and some possible views about the effects on risk of that change. Please select the view that corresponds most closely to your own. You can check more than one answer, provided that you consider the answers do not contradict each other. You will have the opportunity to add a comment that explains the reason for your choice.
Click here for the verbal question: [OK]


Questionnaire - Microsoft Internet Explorer provided by Virgin.net
Navigation...
Use this panel if you want to return to previous pages to check your response.
To move on through the questionnaire use the [OK] button.
Go back to:
Introduction
Alfaland
question 1
question 2
question 3
question 4
question 5
question 6
Q7 details
RISK QUESTIONNAIRE
A job-offer is characterised by a number of equally likely positions: which position is the relevant one is unknown until after the job is accepted. Associated with each possible position is a specific income level. Suppose the job offer is changed by transferring some income from a relatively high-paid position to a relatively low-paid position, without changing the income associated with any other position. The transfer is not so large as to make the high-paid position worse than the low-paid position, but it may alter their income rankings relative to the other, unaffected positions.
The risk of the job-offer must fall if the ranking by income of all the positions remains the same. If there is any change in the income ranking of the positions then it is possible that risk increases or remains the same.
If the transfer is from the highest-paid to the lowest-paid position, and after the transfer the highest-paid position remains the highest and the lowest-paid remains the lowest, then risk must fall. In other cases we cannot say a priori how risk will change.
The transfer may change the relative income-ranking of other positions. So we cannot say a priori how risk will change.
Risk must fall, even if there is a change in the income ranking of the positions as a result of this transfer, and even if the transfer is not from the highest-paid to the lowest-paid position.
None of the above.
In the light of your answer to this question do you want to change your answer to any of the other questions? If so, please use the navigation bar to return to the previous pages.
Do you want to add a comment of your own?
Reset
[OK]


Questionnaire - Microsoft Internet Explorer provided by Virgin.net
Navigation...
Use this panel if you want to return to previous pages to check your response.
To move on through the questionnaire use the [OK] button.
Go back to:
Introduction
Alfaland
question 1
question 2
question 3
question 4
question 5
question 6
Q7 details
question 7
RISK QUESTIONNAIRE
Finally, we would be grateful for some information about yourself:
Are you male or female? M /F
What is your age? years
What is your special subject of study?
Were you employed before university? Yes /No
How would you rate your political views? Please select one of the options on the scale below.
extreme left extreme right
How would you rate your family's income in 1990? Please select one of the options on the scale below.
very poor very rich
How would you rate your own income prospects in the year 2010? Please select one of the options on the scale below.
very poor very rich
Reset
[OK]


Questionnaire - Microsoft Internet Explorer provided by Virgin.net
Navigation...
Use this panel if you want to return to previous pages to check your response.
To move on through the questionnaire use the [OK] button.
Go back to:
Introduction
Alfaland
question 1
question 2
question 3
question 4
question 5
question 6
Q7 details
question 7
RISK QUESTIONNAIRE
Finally we would be very grateful for your reactions to this questionnaire:
How frequently do you use the Internet? Every day
Have you completed an Internet questionnaire before? Yes No
Did you find the navigation bar useful? Yes No
Did the verbal question help to clarify the issue in the numerical questions? Yes No
Did you consult anyone else while filling out the questionnaire? Yes No
Roughly how long did you need to complete the questionnaire? 10 minutes
Which was the principal language that you used? English
If another language had been available which would have been the most useful?
Please click to finish your questionnaire session [OK]


Thanks - Microsoft Internet Explorer provided by Virgin.net
RISK QUESTIONNAIRE
Thank you for taking part in the questionnaire. Your responses will be useful in further research on risk. .
[OK]