CLIMATE ETHICS SURVEY

Disentangling Public Risk Preferences from Inequality & Time

Jennifer F. Helgeson

Environmental Change Institute

University of Oxford

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Supervisor: Dr. Cameron Hepburn

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Statement of Authenticity

Except where otherwise stated and acknowledged,
I certify that this dissertation is my sole and unaided work.

Candidate Number: 51269

Name: _____

Signature: _____

Date: _____

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This work is dedicated in loving memory of

Richard Andrew Helgeson

(1987-2005, victim of sudden cardiac death)

If each person in this world were endowed with his:

Soundness of mind,

Goodness of heart, and

Purity of soul,

What a wonderful world it would truly be.

Abstract

This dissertation disentangles individuals' preferences for the elasticity of marginal utility, η, a central and ethically important parameter in the economic analysis of climate-change. Preferences for η in the dimension of risk are separated from preferences in the dimensions of inequality and intertemporal substitution (time) by creating a worldwide on-line *Climate Ethics Survey* of public attitudes. The experimental measures are based on respondent choices in hypothetical situations established with least departure from the standard economics framework possible. Sample heterogeneity, climate-change policy specificity, and incorporation of risk (individual and societal), inequality (national and global), and time makes this work genuinely novel regarding past studies.

This dissertation shows individual measures of relative aversion to risk, inequality, and time display substantial heterogeneity and are essentially uncorrelated. The majority of respondents are least risk tolerant for national inequality, global inequality, and time, with $\eta>7.5$, while the modal response for both individual and societal risk indicates $3.0<\eta<5.0$.

Thus, the outcome of this work challenges standard economic assumptions that: 1.$\eta=1$ and 2.η is constant across: risk, inequality, and time. The findings suggest the structure of the economic analysis of climate-change is flawed because the underlying model is not rich enough. This effort effectively addresses the failures of analysing climate-change discounting using conventional economic or ethical frameworks in isolation and builds a solid case for structuring preference sets disentangling risk from inequality and time outside the expected-utility framework. If employed in sensitivity analyses of climate-change policies, these values for η would advocate different consumption-path choices than those determined by i.e. *The Stern Review*.

Additionally, demographic and attitudinal indicators are compared between individual risk, social risk, national inequality, global inequality, and time using an Ordered Probit Model. It is demonstrated that a number of risky behaviours, i.e. smoking, are not significant indicators of attitudes towards higher-stake gambles on either the individual- or societal-levels. Additionally, gender and country of residence are uniformly statistically significant indicators of greater aversion to: risk, inequality, and time.

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Abbreviations List

CBA	-	Cost-Benefit Analysis
CES	-	Climate Ethics Survey
CRRA	-	Constant Relative Risk Aversion
GDP	-	Gross Domestic Product
GHG	-	Greenhouse gas
GI	-	Global Inequality
IAM	-	Integrated Assessment Model
IES	-	Intertemporal Elasticity of Substitution
IR	-	Individual Risk
MAC	-	Marginal Abatement Cost
ME	-	Marginal Effect
MPC	-	Marginal Propensity to Consume
MRS	-	Marginal Rate of Substitution
NI	-	National Inequality
OLS	-	Ordinary Least Squares
OPM	-	Ordered Probit Model
PPP	-	Purchasing Power Parity
PV	-	Present Value
RRA	-	Relative Risk Aversion
RRT	-	Relative Risk Tolerance
SR	-	Social Risk
SWF	-	Social Welfare Function
VNM	-	Von Neumann Morgenstern

CHAPTER.I

Introduction/Context

I.i) Research Aims

This dissertation explores the valuation of a key parameter (η, *eta*) in the economics framework for assessing possible climate-change policies. The current practice of expressing three distinct dimensions: 1.risk aversion; 2.aversion to inequality; and 3.time preferences as η of constant value is of specific concern. Though arcane, mathematical, and difficult to conceptualise, this single parameter is a driving force behind the CO_2 stablisation points and consumption paths advocated by climate-change economics; consequently its valuation is of integral consideration.

This research ascertains public attitudes, through a worldwide on-line stated-preference survey, towards each of the three η dimensions: 1.risk; 2.inequality; 3.time. The goal is to determine whether it is sound to suggest disentangling them in the traditional economic treatment of discounting.

This dissertation is most concerned with the concept of risk of the three η dimensions, with additional emphasis on determining the main influences on individuals' attitudes with regards to individual- and societal-level risks.

I.ii) Climate-Change Economics

Climate-change economics is challenged by "distinctive features of the climate problem–including long time scale, extent and nature of uncertainties, international scope of the issue, and uneven distribution of policy benefits and costs across space and time" (Goulder and Pizer, 2006). Stern (2006) cites climate-change as "the widest-ranging market failure ever seen," while accounting for the fact that additional severe social damages will occur outside traditional market structures.

Cost-Benefit Analysis (CBA), a method to determine the alternative providing the greatest return for a proposed investment, requires a consistent metric be employed to compare mitigation costs with probable climate-change impacts (Tol, 2004). However, CBA is not well-suited to assess climate-change policy alternatives because of non-market impacts. Emission reduction costs directly linked to market transactions are expressed monetarily, but this is not true of non-market health and ecosystem impacts. The challenge of determining the marginal abatement cost (MAC), in light of goods not readily expressed in monetary terms, has lead to Integrated Assessment Models (IAMs), which, for example, link traceable economic feedback from changes in greenhouse gas (GHG) concentrations to maximise net benefits.

The assumptions built into climate-change economic models relate to scientific and social projections. Uncertainty levels and risk probabilities create the need to prepare for the most severe projected outcomes as a form of *social insurance*. Provision must be made for the fact that "emissions do not have any simple proportional relationship to economic activity" (Hope, 2005). And it must be recognised that CBA is subject to political pressures; key decisions concerning aggregation across time-periods and regions are embedded in ethical judgments.

Literature addressing climate-change CBA highlights four main shortcomings: 1.discounting methodology; 2.assumptions of substitutability between natural and other forms of capital; 3.treatment of uncertainty; and 4.relevance of marginal costing. Weaknesses of CBA are noted in the field of climate-change economics; however, "alternative approaches to climate-change policy…are not without weaknesses. They

are largely arbitrary and arguably more politically unstable…[however] the in principle need for CBA will not diminish" (Dietz 2006).

Consequently, CBA remains an important climate-change economics' tool, but weaknesses related to the discount-rate must be improved by exploring public preferences through means other than revealed market valuations or isolated ethical considerations. IAMs would be enhanced by inclusion of explicit measures of risk, inequality, and time preferences under the CBA discounting framework that adequately reflect public attitudes. It is this lacuna in the climate-change economics framework that this dissertation addresses.

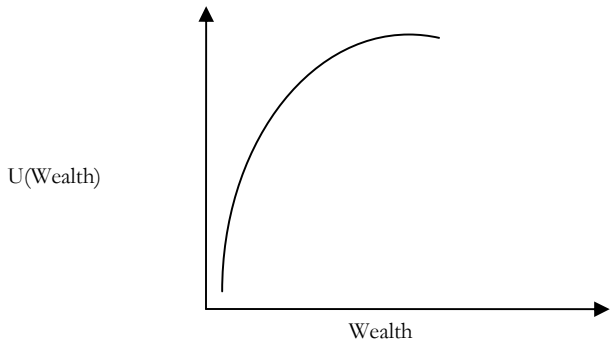
CHAPTER.II

Theoretical Background

This chapter explores various theoretical considerations undertaken in the development of the *Climate Ethics Survey (CES)*. It investigates relevant theoretical approaches, especially those of economics, to discerning risk from inequality and time.

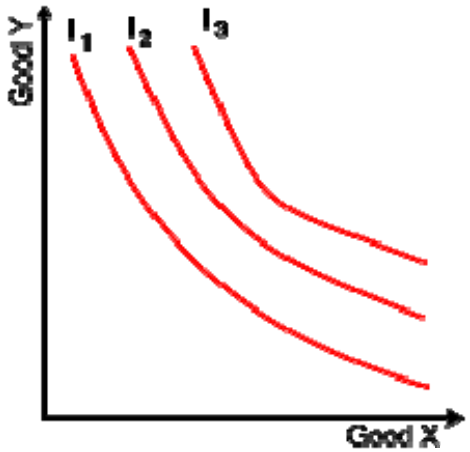
II.i) Utility Introduced

The method employed in this dissertation assumes utility theory, under which an agent has utility function: $U(x_i)$ where x_i are amounts of goods with index i. It is possible to derive a utility function of overall consumption, $u(c)$. An individual's utility function and related utility curve (FigureII.1) is the relationship between utility and the supply of something that increases utility (i.e. happiness). Typically this *something* is recognised as consumption and expressed monetarily. The assumption behind all expected utility (EU) theory is that individuals seek to maximise expected value of the utility function.



FigureII.1.

Utility functions assign numbers to consumption bundles; "preferred" bundles are assigned a higher number than those less "preferred." A utility function represents a preference relation if for any consumption bundles, X and Y, U(X)>U(Y). However, the utility function representing a preference relation is not unique; geometrically, it simply labels indifference curves, which are shown in FigureII.2 for the case when there are two goods, X and Y. All bundles lying along a particular indifference curve must satisfy: U(X, Y)=*a*, where *a* is a constant; thus, all bundles on an indifference curve give the same utility.



FigureII.2: Three indifference curves. Points along I3 have highest utility; points along I1, lowest.

II.ii) Discounting Framework

Any attempt to compare the impacts of a policy over time requires a mechanism for comparing costs and benefits in the future with costs and benefits today. Mitigating climate-change effects is no different. A high discount-rate is controversial for long-term policies, as it implies a low valuation of future generations' welfare.

The basic discounting framework follows Ramsey's neo-classical growth model (1928) under which the discount-rate is based on an endogenous savings rate. To accommodate uncertainty surrounding future consumption many economists apply an exogenous, certainty-equivalent, discount-rate that declines over time. Yet, this approach assumes uncertainty over future consumption is independent of the policy choice being made, which is not true for climate-change policy (Dietz, 2006). The Ramsey discount-rate equation is presented with relevant parameters, explained by (1).

(1) $\rho = \eta \bullet g + \delta$

η: Intertemporal elasticity of substitution; elasticity of marginal utility of consumption.

g: Consumption growth rate.

δ: Rate of pure time preference.

Future generations are often assumed to be relatively richer compared to the current generation, and thus, their consumption is given less weight today. The *descriptive* method of calibrating δ is based on individuals' observed time preferences through saving rates and associated consumption paths (Pearce, 1999). However, there is scope for a prescriptive δ valuation based on the fact that future generations merit equal weight in an ethical framework (Broome, 1992). This consideration results in a somewhat lower rate for δ, primarily the chance that humanity goes extinct.[1] Critics of this practice assert that a low time-preference causes the current generation to save far too much in support of far-off generations (Arrow, 1995). But, this opinion depends upon assumptions of substitutability between natural and other forms of capital and the extent to which future technology can reverse ill-effects from climate-change, which is uncertain.

[1] Primary reasoning δ=0.01 was adopted in the *Stern Review*.

Formally, η expresses the percentage decrease in marginal utility from a one-percent increase in consumption, i.e. the utility function's slope. This formulation of η provides the amount that an additional £ is worth to a relatively poor individual as opposed to a rich individual. For example, assume Person *A* is ten times richer than Person *B*. Thus, η=1 indicates an extra £ is worth ten times more to *B* than to *A*; η=2 indicates that an extra £ is worth 100 times more to *B* than it is to *A*. As seen in FigureII.1, marginal utility of an extra £ decreases exponentially as consumption increases, due to the iso-elastic utility function of the form: (2) $u(c) = \frac{c^{1-\eta}}{1-\eta}$.

TableII.1 gives various η valuations based upon observed behaviour from various data sources. Most revealed preferences are derived through individual saving choices and examining income tax structures; Cowell and Gardiner (1999) conclude that a valuation for η from 0.5 to 4 is reasonable. Prime among four arguments Hepburn (2006) makes against the use of market prices in determining the discount-rate is the failure of market prices to reflect social goods' shadow prices.[2]

Data Source	Data	η value	Source
Revealed individual preferences	Lifetime consumption behaviour (UK)	0.83	Blundell(1994)
Revealed individual preferences	Insurance	2 or slightly greater	Dasgupta(1998)/Friend(1975)
Revealed social preferences	Income tax (UK)	1.28 / 1.41	Cowell and Gardiner(1999)
Revealed social values	Income tax (OECD)	1.4	Evans(2005)
Stated preferences	Leaky bucket experiment	0.2 – 0.8	Amiel(1999)

TableII.1: η estimates, various observation methods.

The two central parameters in the discounting framework (1) are: 1.the pure rate of time preferences (utility discount-rate); and 2.the elasticity of marginal utility of consumption. The values assigned to these

[2] Shadow price—true social opportunity costs of societal goods; may be determined by *revealed preference* methods in some, but not all, cases.

parameters critically affect climate-change CBAs, possibly to the extent of advocating undesirable consumption paths. Sensitivity analysis from the *Stern Review* shows η is a dominate factor in the variation of expected consumption damages by climate-change (TableII.2).

Parameter	**Valuation range** ***(based on value judgments)***	**Percentage change in consumption damages**
Increasing elasticity of marginal utility of consumption, η (risk aversion and inequality)	1–2	-7.0
Increasing rate of pure time preference, δ	0.1–1.5%	-8.0

TableII.2

There is contention between climate-change economists as to discounting parameter valuation, under mathematical frameworks, given realisms of the world, and moral obligations. For instance, Nordhaus' assumptions (2006) result in a *"climate-policy" ramp*, advocating modest near term emissions reductions rates, followed by sharp reductions in the medium- and long-terms. He asserts that the discount-rate should be based on market values. This point is supported by the fact that capital-intensive economies (low-savings) are generally associated with highest-returns on technological and human-capital investments, thus encompassing R&D initiatives that will aid in climate-change abatement measures. But no matter "what should happen," in reality, global actions to date demonstrate that a higher discount rate actually translated to a "do nothing now" attitude towards climate-change abatement (*Economist*, 2006). Nordhaus' own analysis shows that choosing $\eta=1$ requires valuing δ around 3%, not 0.1%. Nevertheless, given the basic determination of ρ, in (1), there is not an a priori choice for of η corresponding to a chosen δ valuation.

In the *Stern Review* and most economic analyses of climate-change,[3] impact costs are aggregated across three dimensions: 1.states of nature; 2.regions; and 3.time. Subsequently, consideration must be made for: 1.risk aversion; 2.intragenerational equity; and 3.intergenerational equity. "Key observations show that the standard model is not rich enough to separate key ethical dimensions relevant to climate-change…in particular, utility functions that separate risk from inequality would be a preferable starting point" (Beckerman and Hepburn, 2007). There has been some theoretical research into alternative preference specifications: Kreps and Proteus (1978) and Epstein and Zin (1989). Both develop classes of general preferences which permit risk attitudes to be disentangled from the extent of intertemporal substitutability. (ChapterII.vi)

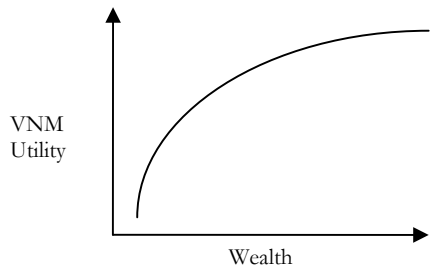
Value judgments guide the approach taken towards risk, inequality, and intertemporal substitution in discounting. But, due to η's triple role, it is not immediately obvious whether increasing η produces an increase or decrease in the present value of climate impacts. When considering the dimensions of risk and equity, an increase in η's value produces increases in the social cost of carbon (SCC), but along the dimension of intertemporal substitution, there is implied reduction in the SCC (Dietz, 2006). Thus, facing the extreme stakes posed by climate-change scenarios, it is inappropriate to make these ethical judgments by reference to observed market behaviour, political practices, or theoretical ethical arguments in isolation.

[3] UK Treasury Green Book advocates this method, with η=1.

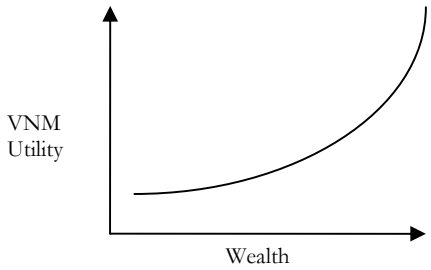
II.iii) Risk–Assuming Expected Utility (EU)

Climate change is expected to impose substantial risks on human societies in the future. Before any policy analysis based on CBA can occur, a framework for assessing risk is required. "Risky," as opposed to "uncertain" refers to events with a known and quantified probability of occurring. For uncertain events, the probability of occurrence is not known with certainty. When making a decision under risk, one is concerned with various outcomes' attributes, but also with the probability of each outcome coming to fruition. Bernoulli (1738) proposed the EU framework, premised on decreasing marginal utility with increased wealth as well as the importance of considering an agent's risk aversion.

Von Neumann and Morgenstern (VNM) (1944) followed by developing an EU theorem evaluating gambles. Under the EU framework, $EU = \Sigma U(x_i)p_i$. The shape of an individual's utility function when confronted with a gamble is determined by her preferences and relative wealth-level. A risk-averse individual needs to be compensated for the assumed risk by the certainty equivalent of the given gamble, which is analogous to a sure payoff at the expected utility level of the gamble, $EU=U(x_1)*p_1+U(x_2)*p_2$. Risk aversion is represented by a concave utility function (decreasing slope and negative second derivative). The more risk averse the agent, the greater level of concavity displayed in her utility function. (FiguresII.3-4). Under the EU framework, risk aversion arises because an additional £ is worth relatively more in the *bad* state of nature than a *good* one.



FigureII.3: VNM Utility Function; Risk Aversion.



FigureII.4: VNM Utility Function; Risk Seeking.

The generally accepted measure of an agent's *degree* of risk aversion was introduced by Pratt (1964) and Arrow (1965). The Arrow-Pratt coefficient of absolute risk-aversion is defined as: (3) $r_u(c) = -\frac{u''(c)}{u'(c)}$. Experimental and empirical evidence (market data) are most consistent with decreasing absolute risk aversion (Cicchetti, 1994). The wealthier an individual, the smaller is the maximum amount she is ready to pay to escape a given additive risk.

The Arrow-Pratt coefficient of relative risk-aversion(RRA), is defined as:

(4) $R_u(c) = cr_u(c) = -\frac{cu''(c)}{u'(c)}$. RRA measures one's willingness to accept risk as a function of the percentage of one's wealth exposed to said risk. The advantage of this metric is it remains a valid measure of risk aversion when the agent's preferences for risk taking behaviour change over time. The agent's utility function need not be strictly convex or concave over all consumption, *c*, assuming RRA.

In the climate-change context, risk aversion may best be conceptualised as constant relative risk aversion (CRRA). Countries of all wealth levels are affected, but it is unrealistic to assume that people in poorer countries evaluate the absolute size of climate-change risk irrespective to their wealth level and in the same context that people in the richer countries do. RRA reflects people's aversion to risk based upon the relative magnitude of the risk they specifically face.

II.iv) Risk–Critique of EU

This dissertation suggests that climate-change economic analyses are inherently flawed because the underlying EU framework is not rich enough. This section presents established EU criticisms.

Restrictiveness of the EU model is acknowledged; an overarching criticism being uncertainty under VNM utility theory is strictly objective. According to Pratt (1964) the effect of risk on well-being depends on three factors: 1.nature of the risk; 2.wealth of the agent; and 3.the utility function. But, there are factors in the decision-making process, such as ambiguity, subjective beliefs, and non-linearity in utility, which are not represented under EU. Alternative approaches to EU have been introduced in the field of behavioural economics, primary among which is Prospect Theory.

Under EU, risky prospects are assigned objective probabilities; however, real-world decision probabilities are uncertain. This fact is especially pertinent to climate-change risks; possible states of nature are wide-ranging and the probability of outcomes under each risk scenario is ambiguous. Einhorn and Hogarth (1985)[4] define ambiguity as an intermediate state between ignorance and risk.[5] An agent is ambiguity-averse if she has a preference for a choice that has a unique probability distribution over options with unknown or possible probabilities.

Savage (1954) suggested the subjective expected utility (SEU) model to address ambiguity:

(5) $SEU = \sum_s p(s)u(x(s))$; p(s) is the subjective probability of the states of nature and u(x(s)) is x's utility in each possible state. In this model, uncertainty is subjective in the sense that there are no objectively (externally) imposed probabilities.

Yet, the Ellsberg Paradox (1961) questions SEU's validity, proving strong ambiguity aversion. It demonstrates the impossibility to infer probabilities from choices people make. This Paradox holds in cases when the choice set compares an ambiguous proposition with a more certain proposition; it is not necessarily

[4] Proposed anchoring-and-adjustment method for ambiguity magnitude and attitude.

[5] Ignorance—having no information to rule out any probability distribution possibilities; risk—having one well defined probability distribution.

true when ambiguous propositions are compared to one another in isolation (Fox and Tversky, 1995). In short, people's decisions in situations defined by lack of information about the probability of different states, i.e. climate-change, may not rely on subjective probabilities as predicted by SEU. Either people do not actually create subjective probabilities for ambiguous situations or they are not confident enough to use them in final decision-making.[6]

The work of Friedman and Savage (1948)[7] indicates that an individual's utility function does not necessarily have the same kind of curvature at each point. At various wealth-levels, an individual may fluctuate between risk-loving and risk-averse attitudes. The Friedman-Savage double inflection utility function (FigureAI.1) explains why people are prone to take low probability, high-payoff risks (i.e. lottery playing), while insuring against mild risks with mild payoffs. A natural explanation of these observations is given in the Allais Paradox (1953): individuals simply overweight low-probability events.

Rabin (2001) makes the basic criticism that calculated CRRA for a small-stakes gamble, when applied to gambles with higher stakes, leads to absurd behavioural predictions. This assertion is supported by Kahneman's (1979) criticism that EU is based on considerations of risk with regards to wealth rather than changes in possible wealth (marginal changes).

[6] Related to *bounded rationality*. (ChapterII.viii)

[7] Specifically focused on univariate risk aversion, implying that facing choices with comparable returns, agents chose the less-risky alternative.

II.v) Alternatives to EU—Framing Risks

The nature of climate-change requires economics takes into account qualitative considerations outside the realm of using monotonic transformations, which cannot be captured in a numeric utility function framework. This is a key premise of this dissertation. Prospect Theory (Kahneman and Tversky, 1979) recognises judgement heuristics and biases, capturing some qualitative considerations not covered by EU.

Framing risk questions encompasses numerous effects: status quo bias, isolation effect, endowment effect, anchoring, and loss aversion. Identical option sets result in different choices if presented alternatively (i.e. gain rather than a loss). People tend to make decision probability estimates starting from an initial value that is adjusted to yield the final answer (Kahneman, 1992). These adjustments are rarely sufficient; different starting points introduced in the problem formulation or respondent calculations yield different responses (Slovic, 1977). This *anchoring* value may be suggested by the initial formulation/presentation of the problem.

The extent to which one *identifies with* an event strongly influences the ease by which one can accurately assess the event's occurrence probability. *Availability* is conditioned by highly individualised factors of instance retrievability, i.e. familiarity and salience. Thus, high-probability classes are recalled better and faster than instances of less frequent classes (ibid). For low probability, high impact risks, individual opinions tend to be influenced by social conditioning. Sunstein (2006) evaluates a number of studies and determines: "taken together with intuitive cost-benefit balancing, the availability heuristic helps to explain differences across groups, culture, and even nations in the assessment of precautions risk-reduction associated with climate-change."

Models that address EU theory's short-coming have made advancements, i.e. rank-dependent EU (Quiggin, 1993) and cumulative prospect theory (Kahneman and Tversky, 1992). Yet, there are uncertainty levels and general effects not accurately captured in these models. For climate-change, the ambiguity levels in probabilities and magnitudes of outcomes border on exceeding those that can be modelled; climate-change outcomes are uncertain to an extent that is characterised by Knightian uncertainty rather than risky situations (Dietz 2006).

People are better described as having *attitudes* than *preferences* – certainly in the domain of public concerns (Kahneman, 1999). There is a strong link between attitudes and *availability* conditioned by a variety of social motivators (TableAI.1). Subsequently, members of different cultures selectively *attend* to different categories of danger (Weber, 2006). Considering attitudes in this way supplements economic frameworks by explicitly acknowledging qualitative factors of the decision-making process.

II.vi) Risk and Time (Intergenerational Distribution)

This section discusses assessment of risks over time and differentiates time as intertemporal substitution[8] from that of risk, which is a main assumption of the underlying framework for this dissertation.

Prudence connects risk and time; an agent is said to be prudent if uncertainty affecting future incomes raises savings (Leland, 1968). Observed agent expectations under Prospect Theory (in addition to EU) vary significantly based on the specification of the defined evaluation period (Benartzi and Thaler, 1995). This observation is related to behavioural learning and experience between periods.

The concept of intertemporal substitution is founded upon marginal rate of substitution (MRS) between periods. The MRS is the rate at which an agent is willing to give up goodA in exchange for goodB. The fact that total satisfaction must be consistent, leads to MRS being mathematically defined as the negative slope of the agent's indifference curve for the two goods: (6) $MRS_{C_1C_2} = \frac{MU_{C_1}}{MU_{C_2}}$.

The formal definition of intertemporal elasticity of substitution (IES) is:

(7) $IES = \frac{d\ln\left(\frac{c_i}{c_j}\right)}{d\ln(MRS)} = \frac{d\ln\left(\frac{c_i}{c_j}\right)}{d\ln\left(\frac{U_{c_i}}{U_{c_j}}\right)}$. This formulation is premised on the two-period consumption model: (8) $U_1(C_1) + Eu_2(\tilde{c}_2)$, which assumes the objective function is additive across the dimensions of: 1.states of nature and 2.times. Both risk aversion and aversion to intertemporal consumption are represented identically and assumed equal under this model. Thus, the relative risk tolerance RRT=(1/η), defined as the reciprocal of RRA, equals the elasticity of intertemporal substitution.

Though aspects of one may inform an agent's perception of the other, aversion to time and aversion to risk are different cognitive concepts. Kreps and Porteus (1978) and Selden (1978) propose alternative models which separate consumption attitudes over time and across states. Mathematically these preferences

[8] Decision to forego current consumption to consume in the future.

are an extension of the standard additive model (8) considering individuals' time preferences separate from risk aversion. Further extensions to this model use power functions to specifically disentangle the elasticity of intertemporal substitution from the coefficient of relative risk aversion (Epstein and Zin, 1991). In analyses using this form, empirical evidence shows that "agents are more risk-averse than they are resistant to intertemporal substitution" (Gollier, 2001).

Early information is valued; informed agents are able to make better decisions and people prefer early uncertainty resolution (ibid). This is especially the case when a decision path cannot necessarily be revamped at a later period, i.e. long-term climate-change mitigation policies.

Broome (1994) draws a distinction between discounting commodities (through pricing) opposed to discounting fundamental human well-being. However, Weitzman (1998) introduces the "empathetic distance of discounting;" the greater the generational gap becomes between our time and the time of a possible disaster, the less people show any genuine concern.

II.vii) Risk and Inequality (Intragenerational Distribution)

This section discusses the relationship and differences between risk aversion and inequality aversion. This dissertation challenges a number of formal links between risk and inequality established in the literature: Roshschild and Stiglistz (1973), Atkinson (1970) and Harsanyi (1953).

Bergson (1938) introduced the utilitarian social welfare function (SWF) to "state in precise form the value judgements required for the derivation of the conditions of maximum economic welfare." It is of the functional form: (9) $W = \sum_{i=1}^{N} k(i)U(i)$, specifying a weighted sum of additive individual utilities. Given this classical utilitarian SWF, η can be interpreted as the constant social inequality aversion:

(10) $U(x_i) = \frac{x_i^{1-\varepsilon} - 1}{1-\varepsilon}$ where ε is the inequality aversion parameter.

Atkinson (1970) associates inequality as "risk in new clothes," explicitly linking the representative agent's degree of risk to society's degree of inequality. This formulation transposes main concepts of probability distributions for risk under uncertainty onto the income distribution. His conclusion rests heavily on the assumption of agents with identical preferences when faced with an income-distribution lottery. Harsanyi (1953) comes to a similar conclusion, but recognises agents do not have identical preferences. Rather, he models choice amongst lotteries behind a veil of ignorance as to the agent's identity. Subsequently, social aversion to inequality becomes explicitly based on personal aversion to risk. Though, the models are within reason, both Harsanyi and Atkinson make assumptions about human nature that do not stand up to ethical or behavioural scrutiny (Broome, 1991).

In opposition, Sen (1973) asserts utility is not defined independently of individual choice. He proposes a welfare function that is group (i.e. country) specific. This mathematical analysis is supplemented by the recognition that attitudes to inequality differ by country but are relatively stable over time (Ladd and Bowman, 1998). *Happiness economics* shows that despite becoming richer over the last 50 years, Westerners

have not become happier (Layard, 2005). This is a strong empirical argument for the fact that well-being (utility) is dependent on relative, rather than absolute wealth.

As Cowell and Gardiner (1999) assert, society does not necessarily agree that the rate of transfers between the rich to the middle class should be identical to transfers between the quite well off and the poor. Thus, there is a strong case that inequality aversion, much like risk aversion under Savage's two-point inflection model is not consistent at all points along the utility function. Amiel and Cowell (1996) find the level of agreement with a small transfer from a richer to a poorer person decrease unequally, depending on the specific income of the poorer individual and her social income distribution position.

The worst effects of climate-change will effect the world's poor and the comparatively poor within any given country relatively more intensely than the rich (Stern, 2006). For instance, Stern (2006) estimated increases in damage costs under the scenario of weighting; this resulted in a balanced growth equivalent of 6%.[9] The level of risks and uncertainties faced informs the provision of weighting within the SWF. Yet, risk may inform attitudes towards inequality, as does timeframe, but these concepts are distinguished by other attributes and underlying preferences.

The following section describes some ethical frameworks which apply to the consideration of discounting climate-change impacts and valuing the relevant dimensions.

[9] Stern did not formally weight outcomes, but estimates show an increase in damage costs in terms of balanced growth equivalent of 6%; weighting provided, is incorporated into the 20% estimate of climate-change damages.

II.viii) Rationality and Ethics

Climate-change economics cannot escape from making ethical judgements in valuing η (Stern, 2006); though, these must be balanced by sound consideration for scientific forecasts, and most importantly, social attitudes. Under the EU framework *rational* actors maximise utility; however, ethical frameworks call for fairness and justice to be incorporated alongside *rationality*. Simon (1957) introduces *bounded rationality*; most individuals are partly rational, but are in fact driven by emotional (irrational) factors in many decisions. This section introduces ethical structures applicable to challenges posed by climate-change.

Hume (1739) challenges whether society can make moral judgments relying on reason. His argument is outlined as follows: 1.reason alone never motivates; 2.morals excite passions and produce or prevent actions; that is, they motivate; 3.therefore, morality cannot be derived from reason alone (Hume, 1739). Thus, when we call behaviour irrational, what is really meant is that it was accompanied by false beliefs. Being 'moral' is about one's goals, rather than one's beliefs; and since goals are set by the 'passions,' morality as such is not to be evaluated as rational or irrational (ibid). To this point, individuals have a world-view reflective of preferred lifestyle and each world-view is associated with a different rationality (Leiserowitz, 2006); subsequently what one agent sees as rational is not necessarily rational to all agents.

Rawls (1971) suggests that rationality can be used to solve social problems; however, this rationality must be structured such that all agents adopt the same rational views towards determining "justice as fairness in society." This agent-neutral view rests on an assumed hypothetical agreement made under conditions of equality. Accordingly, in order to eliminate bargaining power disparities, three major assumptions are made: 1.original position–hypothetical condition of humanity before the foundation of society; 2.veil of ignorance–agents are unaware of their position in society; 3.maximin rule–decision rule for minimising the maximum possible loss. Harsanyi (1955) assumes Rawls' agent-neutral view in his conclusion that aversion to risk and inequality are fundamentally the same.

Rawl's framework, though limited in real-world applicability, does have credence when considering inequality and risk within a single generation. But, Barry (1978) points out that "one generation gains no

advantage in making concessions to later generations" and though assuming a veil of ignorance simplifies matters, agents certainly know their position in society. The contractualist idea of justice as mutual advantage is extended to negotiations between generations in a manner applicable to real-world circumstances by Laslett (1992). He considers three generations at a time; each generation has contractual duties towards the next generation, balanced by rights it holds over the previous generation. Given that at any time, three generations are alive, this has potential applicability and also begins to deal with "empathetic distance of discounting" (Weitzman, 1998).

Finally, Ramsey (1923) found "discounting is a practice which is ethically indefensible and arises merely from the weakness of imagination" in mathematical theory. It is not feasible to ignore discounting, but there is room for framework improvements. The previous ethical arguments should be recognised as guidelines; however, the extent to which ethical absolutes can be encompassed within a model driven by economic theory and striving to reflect real-world circumstances presents a great challenge.[10]

The following sections discuss the method employed to determine public attitudes in developing the *Climate Ethics Survey*. There is analysis and discussion of valuations for η in the dimensions of: risk, time, and inequality determined from the sample data.

[10] i.e. Rawl's theory requires $\eta=\infty$, representing absolutely uncompromising aversion to inequality and risk in consumption.

CHAPTER.III

Methodology

Data used in this dissertation were collected via online-survey; the *Climate Ethics Survey (CES)* was designed and distributed in collaboration with Håkon Sælen. The survey remains online: http://hakon.red-redemption.com//index.php?sid=25; the reader is encouraged to take the survey, which requires about 15 minutes.

This experiment obtained information about theoretically important parameters from direct questioning of the public under hypothetical situations. It was important to have minimal departure from the concepts of economic theory of the parameters being tested in order to make results comparable to theoretical assumptions.

Six questionnaire versions were developed; five individual country versions incorporate the same questions and sequencing, but reflect national currencies and adjustments for purchasing power parity (PPP). Respondents from nations other than: 1.Australia, 2.Canada, 3.Mexico, 4.the UK, and 5.the USA, responded in a general form survey which expressed questions in U.S. dollars, providing some international exchange rates to give the respondent a frame of reference. The on-line survey was scripted using PHP Surveyor™ on web-space provided by Red Redemption, Ltd. (Paper version available in AppendixIII.)

Previous experimental work has been undertaken in this field; notably: Johansson-Stenman (2002) and Barsky (1997). The structure and format of these experiments were considered in the design of the *CES*; however, it is differentiated by the heterogeneity of the sample, the web-based survey interface, and the fact that risk, inequality, and time are all incorporated.

III.i) Pilot Testing

A draft version of the survey was tested for clarity and consistency by students, academicians, and the public. Students of the MSc Environmental Change and Management at the University of Oxford were asked to provide feedback on a test survey; twelve detailed responses were received. The survey was also tested by Giles Atkinson, PhD and Simon Dietz, PhD, London School of Economics. Atkinson tested the survey on a group with no Environmental Studies background. This feedback led to question rewording, provision of more detail, and graphical representation clarification.

III.ii) On-line Interface

There is considerable literature concerning the merits of remote on-line interface experiments in comparison to traditional laboratory settings; especially regarding response quality. Overall, advantages appear to outweigh disadvantages in the use of on-line interfaces (Reips, 2000).

Low-cost of on-line survey delivery allows a greater pool of possible respondents to be initially contacted, increasing sample heterogeneity. The majority of laboratory experiments use students as subjects while this demographic makes up only about 3% of the population. The increased heterogeneity possible under the on-line interface allows results to be generalised with greater validity (ibid.). Internet-use for the *CES* provided access to a global response population. Online surveys tend to garner large aggregate samples, providing more flexibility with the data analysis and statistical tests have greater power (Schmidt and Jacobsen, 1999). There are self-selection issues with on-line recruited sample bases. But this is true of all experiment formats which recruit in this manner, whether the final experiment is on-line or not (Charness, 2003).

The main concern is the extent to which respondents fully consider options when taking non-monitored on-line surveys. This is particularly concerning when questions require high-level thinking and abstract scenarios, as is the case in the *CES*. Anderhub (2001) explored this issue by testing an identical computer-based economic game, requiring complex strategies, on-line and in a laboratory. The average score among internet respondents was slightly lower, but not to a significant level.

There has not been a great deal of testing of surveys seeking to garner subjective respondent preferences. In situations in which the researcher is interested in the formation of preferences it is preferable to have an in-person interview methodology, which allows the process to be documented (Hanley per.comm.). But this is an issue for any survey not administered in person (i.e. posted surveys). Cowell and Cruces (2003) conducted an on-line survey on risk perception based on fundamentally different patterns of subjective risk comparisons; question randomisation in their survey would not have been possible via a traditional paper survey. This question flexibility dependent on a given respondent was important in the *CES*

as well. Dohman (2005) conducted in-person interviews to determine whether responses to the 2004 Socio-Economic Panel indicating a greater willingness to take risk show this same willingness in an in-person lottery experiment. They determined that the posted responses were not significantly different from the in-person responses.

III.iii) Distribution

Self-selection played a role in the *CES* as those who are more interested in climate-change were more likely to participate. An *invitation* to participate in the survey was distributed through a number of e-mail lists, primarily based on academic and environmental industry sets of individuals. (TableAII.1) The language of the invitation email (FigureAII.1) was neutral to reduce biasing responses. Since respondents were encouraged to pass along the invitation to other interested parties, it is impossible to determine an exact response rate.

The *CES* was also advertised via *Facebook*, a social network website popular among University students, but open to the general public world-wide since September 2006. As of July 2007, the website had 30 million registered users (Jin per.comm.).[11]

An advertisement for the survey was placed on *Facebook* over a two-day period. This advertisement (FigureAII.2) was neutral to reduce the risk of strategic responses based on expectations. It was seen by 99823 *Facebook* users over a two-day period; of these, 8185 clicked on the survey invitation link. In total, including respondents from all methods, 3645, completed the survey. But, the response rate from *Facebook* in particular is not calculable, as there was no way to differentiate survey respondents that saw the ad from those who were recruited in other manners. The advertisement was assigned at random to users of *Facebook*; there is no way to volunteer or opt out of seeing such information (ibid.). There was no targeting, thus the demographics reflect a sample of *Facebook* users; although, active users of the site are more likely to see such short-term advertisements.

No financial incentive was offered; thus, interest in the subject matter was the prime motivator for individual participation. This likely increased the level of self-selection bias, but it was recognised from the outset that respondents would not be a representative cross-sample of the population at large, though the use of graphics and presentation of the University of Oxford crest may have increased interest in the survey to those who otherwise are not concerned with climate-change.

[11] Registered members logging in at minimum once a month.

III.iv) Survey Design

The *CES* consisted of 32 questions; responding took about 15 minutes, due to a series of lengthy instructions and graphical representations. (Survey remains online at http://hakon.red-redemption.com//index.php?sid=25.) None of the questions were mandatory; forcing respondents to choose an option given complex questions leads to response randomisation and failure to complete the survey (Atkinson, pers.comm.). Respondents were assured of answer anonymity to encourage greater question response rates.

The survey questions can be segmented into three question-type subdivisions. The first question set relates to respondents' general attitudes towards risky situations, political views, and their level of concern about climate-change. The second question segment (survey_sections_2-6) presented complex questions about intragenerational inequality (survey_sections_2-3), risk aversion (survey_sections_4-5), and intertemporal inequality (survey_section_6). Graphical references were used in inequality questions based on findings that illustrations enhance respondents' ability to evaluate alternatives in numeric stated-preference questions (Bateman, 2006). The final question set (survey_section_7) sought demographic indicators; placed last in the survey following from Thomas (2004) that it is best to start with engaging and interesting question sets to encourage respondents to continue the survey.

Survey questions and instructions can be seen in full form, AppendixIII. Brief discussion of question formulation for each section follows.

III.iv.i) Survey_Section_1: Attitudes/Opinions

This section sought to garner respondents' general attitudes towards risky situations. Beckman (2003) shows an individual's approach towards everyday risky situations (i.e. smoking) correlates with general climate-change risk attitudes.

Respondents were asked the extent to which they agreed with two statements concerning whether or not climate-change will pose serious risks within their lifetime. The answer options were based on a Likert-scale from *strongly agree* to *strongly disagree* with an anchoring at *neither agree/nor disagree*. The question wording was identical, differing only that in the first, those affected were the respondent and her family and in the second, the affected population was global society. This is designed to test differences between individuals' conception of global and local risks.

An additional question in this section sought to determine respondents' political views on fiscal issues. This was achieved by inquiring about the role government should have in income redistribution between rich and poor. The question wording and the Likert-scale for answer options was based on the British Social Attitudes survey (Jowell, 1997).

III.iv.ii) Survey_Section_2: Income Distribution (National)

This section investigated people's aversion to intragenerational inequality within a country. Respondents were asked to indicate their preference over two hypothetical income distributions. In each pair, Option *A* had the greatest total national income, while Option *B* gave a more equal income distribution across individuals.[12] The options were described in terms of maximum, mean, and minimum incomes; this information was also graphically represented. Option *A* remained the same in each question, while the income levels given by Option *B* differed. This formulation provides information as to the amount of total income the respondent is willing to trade in order to achieve a more equal income distribution.

Respondents were given detailed instructions concerning the income distribution in the fictitious society. These instructions were meant to isolate the question of interest in this study; the extra value of a £ to a poor person as opposed to the rich. Respondents were told that there was the same number of individuals in each half of the stated distribution. Additionally, the choice in each question only affected society's middle 80% by income. This assumption was made to reduce lexicographic choice strategies (Carlsson, 2005) by encouraging the respondents to consider the trade-off between total income and distribution equality. Respondents were told that prices were the same in all distributions, that no social programmes existed to help the poor and other services, such as education, healthcare, etc. were privately-funded and to assume that their position in the fictitious income distribution was the same as in reality. The study aim was to disentangle aversion to risk and inequality, which is not possible behind a veil of ignorance (Harsanyi, 1953).

The questions in this section used a triple-bounded dichotomous choice format. This structure requires each respondent to answer only three questions; but provides adequate information to divide the respondent pool into eight η value brackets. (This structural concept is illustrated in FigureIII.1) A respondent who chose Option *A* in the first question was presented with a second question in which the

[12] Based on Carlsson (2005) and Johansson-Stenmann (2002).

income levels associated with Option *B* were increased relative to those in Option *B* of the first question, and vice versa.

The response interpretation in this section hinged on the assumptions of societal income distribution and two other standard, though questionable, economic assumptions: 1.isoelastic individual utility functions; and 2.the additive form of respondents' social welfare functions. The isoelastic utility function is characterised by CRRA; η is constant in theory; though recent work does call to question this assumption by assessing actual preferences (Atkinson and Brandolini, 2007).

Thus, social welfare in each income distribution can be described generally as:

$$(11)\quad W = \int_{y_{\min}}^{y_{\max}} \left(\frac{y^{1-\eta}}{1-\eta}\right)\left(\frac{1}{y_{\max}-y_{\min}}\right) = \left(\frac{1}{(1-\eta)(2-\eta)}\right)\left(\frac{y_{\max}^{2-\eta}-y_{\min}^{2-\eta}}{y_{\max}-y_{\min}}\right)$$

Where, η is the relative aversion to income inequality.

When η=1: $$(12)\quad W = \left(\frac{y_{\max}\ln y_{\max} - y_{\min}\ln y_{\min}}{y_{\max}-y_{\min}}\right) - 1$$

And, when η=2: $$(13)\quad W = \frac{\ln y_{\max} - \ln y_{\min}}{y_{\max}-y_{\min}}$$

Assuming a respondent is indifferent between two distribution Options *A* and *B*, implies that W(A)=W(B).

Subsequently, this equality holds: $$(14)\quad \left(\frac{y_{A\max}^{2-\eta} - y_{A\min}^{2-\eta}}{y_{A\max}-y_{A\min}}\right) = \left(\frac{y_{B\max}^{2-\eta} - y_{B\min}^{2-\eta}}{y_{B\max}-y_{B\min}}\right).$$

Solving (11) for η provides the minimum and maximum bounds for inequality aversion for a respondent choosing Option *B*. For η=1 and η=2, the relevant equations to consider are (12) and (13), respectively.

Theoretically only the income differences ratio matters between options; but to present respondents with understandable questions it was necessary to create numeric distributions. The reported disposable income ratio for the UK at the 10th and 90th percentiles informed the choice of four as the ratio of highest to lowest income in Option *A* of each question (National Statistics, 2004). The absolute maxima and minima posed in each question are 40% greater than in reality. This is justified as an adjustment for the assumption

that social services are privately funded. Additionally, this allowed numeric presentation that were fairly straight-forward to interpret, which is important in preventing respondents from reverting to rules-of-thumb (Kahneman, 1991). The ratio between maximum and minimum incomes in Option *B* of each question had to be less than that of Option *A*; the value 1.5 was chosen. The income values for each Option *B* were determined by solving the following simultaneous equation sets, based on (10-12):

$$For\ \eta \neq 1, \eta \neq 2: \begin{cases} \left(\dfrac{4000^{2-\eta} - 1000^{2-\eta}}{4000 - 1000} \right) = \left(\dfrac{y_{B\max}^{2-\eta} - y_{B\min}^{2-\eta}}{y_{B\max} - y_{B\min}} \right) \\ y_{B\max} = (1.5)(y_{B\min}) \end{cases}$$

$$For\ \eta = 1: \begin{cases} \left(\dfrac{4000\ln 4000 - 1000\ln 1000}{4000 - 1000} \right) = \left(\dfrac{y_{B\max}\ln y_{B\max} - y_{B\min}\ln y_{B\min}}{y_{B\max} - y_{B\min}} \right) \\ y_{B\max} = (1.5)(y_{B\min}) \end{cases}$$

$$For\ \eta = 2: \begin{cases} \left(\dfrac{\ln 4000 - \ln 1000}{4000 - 1000} \right) = \left(\dfrac{\ln y_{B\max} - \ln y_{B\min}}{y_{B\max} - y_{B\min}} \right) \\ y_{B\max} = (1.5)(y_{B\min}) \end{cases}$$

III.iv.iii) Survey_Section_3: Income Distribution (Global)

This survey section investigated aversion to intragenerational inequality on a global level. The question and response structure are the same as in the previous section. The main differentiation between the two sections is that the income spread is greater and the maxima and minima are set lower in order to reflect real-world global distribution (Dikhanov, 2005).[13] The ratios between highest and lowest incomes were set at 16 for Option *A* and 4 for each Option *B*. Each survey versions was translated to the respective currency, using market exchange rates rather than PPP figures because of the question's global nature.

[13] Reports 90th and 10th percentiles of world income distribution for 2000 in 1999 U.S. dollars adjusted for PPP. Dikhanov's converted to 2007 U.S. dollars using inflation rates reported by Sahr (2007).

III.iv.iv) Survey_Section_4: Personal_Risk

In this section respondents were asked to choose a gamble between two jobs, differentiated only by wage income gambles. Wage income was chosen because it is a primary contributor to respondents' total wealth. In past experiments, outcome sets have too little impact on respondents' well-being (wealth) to necessarily elicit true risk attitudes (Barsky, 1997). To elicit risk aversion measures reflecting real-world attitudes, proposed gambles must affect a large percent of individual wealth. This is an especially pertinent consideration for climate-change policies, which seek to address associated high-level risks (Stern, 2006). Thus, the low-level risk-outcomes in Cameron and Gerdes (2007) do not adequately address high level stakes in climate-change and do not predict a significant risk premium.

In each of the three questions presented to a respondent, Job *A* is identical. Job *B* always gives 50% probability that income will be double that of Job *A* and 50% probability that income will be lower, the proportion by which varies between questions. The introductory page explained the question format and informed respondents that Jobs differed only in terms of income as a means to control for the fact that "in a choice between two careers, it is plausible that the benefits of one…may be of a different sort from the benefits of another…they cannot be weighted against each other" (Broome, 1991).

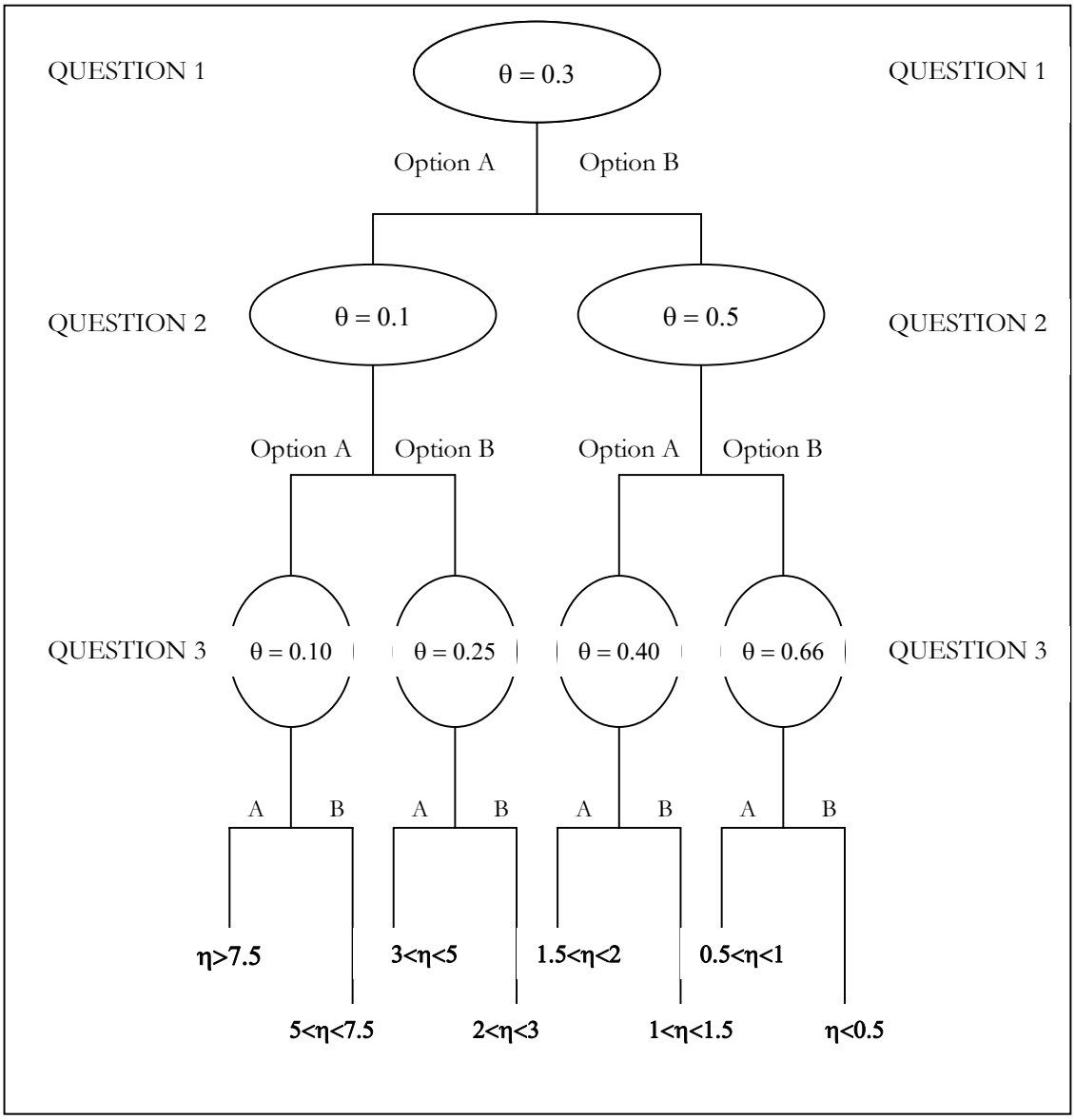
This question set used the triple-bounded dichotomous structure to place individuals into one of eight RRA categories, which correspond to η value ranges. (FigureIII.1). Assuming EU, an individual maximizes utility if she chooses Job *B* in the case that there is a 50% chance that income is double that offered by Job *A* and a 50% chance that it will be lower by a fraction, ϕ, if:

$$(15) \quad \left[\frac{1}{2}U(2y_A)+\frac{1}{2}U(1-\phi)y_A\right] \geq U(y_A).$$

Assuming the isoelastic utility function and defining η as the co-efficient of RRA (4), (15) becomes:

$$(16)\quad \begin{cases} \left[\dfrac{\frac{1}{2}(2y_A)^{(1-\eta)}}{1-\eta} + \dfrac{\frac{1}{2}((1-\phi)y_A)^{(1-\eta)}}{1-\eta}\right] \geq \dfrac{y_A^{1-\eta}}{1-\eta}, & for\ \eta = 1 \\ \frac{1}{2}\ln(2y_A) + \frac{1}{2}\ln((1-\phi)y_A) \geq \ln(y_A), & for\ \eta \neq 1 \end{cases}$$

The η corresponding to an agent's indifference between Job *A* and Job *B* for a given ϕ is determined by (15) and (16). This is possible because η is assumed to be constant across income levels; thus, y_A is normalised at 1. This process was repeated for all response choice combinations, providing boundaries of the η categories (FigureIII.1).



FigureIII.1: Triple-bounded dichotomous choice format.

III.iv.v) Survey_Section_5: Societal_Risk

This section concerned individual attitudes about the risk level that should be taken on the national level (i.e. by government). The triple-bounded dichotomous structure was employed. Respondents were given a brief introduction explaining that government investment decisions can have uncertain effects on the national economy; then asked if they would support a policy based on its probable effect on national average income. Option *A* in each question guarantees that the current national average income is sustained. The probabilities and outcomes assigned to Option *B* in each question are identical to those of Section4, in order to yield identical boundaries for η.

III.iv.vi) Survey_Section_6: Time

In this survey section, respondents choose between intertemporal consumption profiles for the overall economy given a 200-year timeframe. These questions were developed in a manner similar to Barsky's (1997) work to elicit individual preferences for personal consumption patterns before and after retirement. This dissertation is concerned with consumption on a societal level over long time horizons due to the nature of climate-change effects.

The rate at which an individual is willing to trade between present and future consumption depends on three parameters: 1.η, aversion to inequality over time; 2.δ, utility discount-rate–a respondent's pure time preference[14]; and 3.the market interest rate.

Much existing literature is based on surveys that do not distinguish between an individual's utility discount-rate and the market discount-rate. For example, Cameron and Gerde (2007) do not control for the effect of market discount-rates in determining individual utility discount-rates. Barsky (1997) separates the effects of these two factors by asking respondents to identify their preferred consumption path assuming three different market discount-rates; the same approach was adopted in the *CES*.

This section consisted of four questions; all respondents were asked identical questions. The instruction set for these questions tell individuals to assume no inflation between periods, defined as: Now-2107 and 2107-2207. Theoretically, national consumption would be the best proxy for a representative measure of living standards. But national average income was used as it is a concept more easily understood by respondents (Barsky, 1997). The first question in the set had three answer options and served only to familiarise respondents with the question structure. The answer to this question is ignored in analysis as a means to reduce bias from learning effects. The second question was identical to the warm-up question, but gave five answer options. The implicit market interest rate varied between in the last two questions, r=1.39% and r=-1.39%. The formulation of this section allowed respondents to choose irrational consumption paths

[14]Individuals prefer consumption of 'good' things in an earlier rather than later period when delta is positive, and vice versa for negative delta.

based on: 1.inconsistency with utility maximization and 2.implication of negative η value, which was later corrected for.

The equation underlying the question formation in this section is: $(17) \quad \Delta \ln c = s(r - \rho)$

Where: c: Consumption;

s: Elasticity of intertemporal substitution; s=1/η;

r: Real (market) interest rate;

ρ: Rate of pure time preference.[15]

To determine the boundaries of a respondent's elasticity of intertemporal substitution it was necessary to ascertain the most tightly upper and lower border amongst the answers provided by the three consumption path questions. Thus, it was necessary to solve the following inequality set based on (17), for unknown s and ρ.

$$(I) \quad j < -s\rho < k$$

$$(II) \quad l < -s(r - \rho) < m$$

$$(III) \quad q < s(-r - \rho) < t$$

In (I), which corresponds to the respondent's answer in the second question in this section, r=0.

In (II), which corresponds to the respondent's answer in the third question in this section, r=-1.39; and

In (III), which corresponds to the respondent's answer in the second question in this section, r=1.39.

Solving each inequality pair gave the following possible boundaries for s, to be tested for each respondent to find the most stringent limits on *s*:

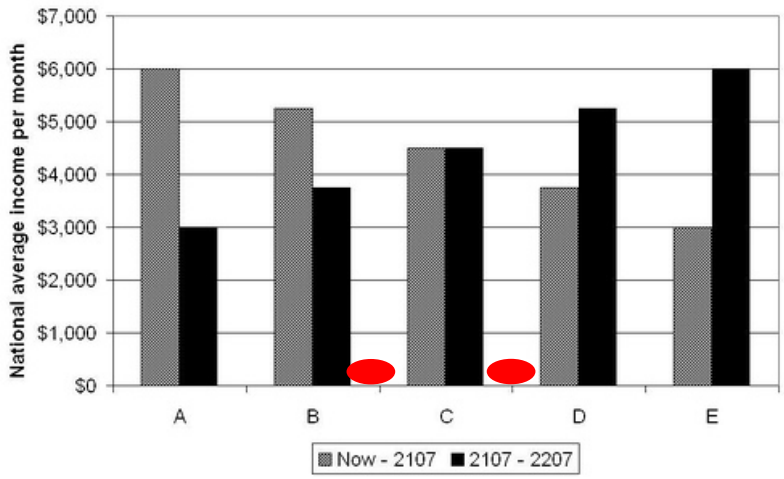
$$(A) \ (I \text{ and } II) \quad \frac{l-k}{r} \prec s \prec \frac{m-j}{r};$$

$$(B) \ (I \text{ and } III) \quad \frac{j-t}{r} \prec s \prec \frac{k-q}{r};$$

[15] Denoted δ elsewhere in this paper.

$$(C)\ \ (II\ and\ III)\ \ \frac{l-t}{2r} \prec s \prec \frac{m-q}{2r}$$

In testing (A), (B), and (C) the midpoints of the options above and below the option chosen by the respondent were inputted. (FigureIII.2)



FigureIII.2: Red dots are where (A),(B),and(C) were evaluated if a respondent chose Consumption Path C.

III.iv.vii) Survey_Section_7: Demographics

To garner sample representativeness, respondents were asked to share demographic attributes in the survey's final section. They were asked 9 questions and broken down into 21 income brackets. Each bracket was comparable between surveys, with adjustment for PPP in each version. A number of questions sought similar data and were inputted in order to give flexibility in the use of proxy data in data analysis for questions respondents chose not to answer. For instance, education level may be a viable proxy for income in some cases (Atkinson per.comm.).

Respondents were asked if they belong to an environmental organisation or conservation group to identify the possible extent of self-selection bias. Respondents were also given the opportunity to read more about the survey or receive aggregated results.

The following chapter presents the data gathered by the *CES*.

CHAPTER.IV

Data

IV.i) Collected Data

The *Climate Ethics Survey* ran two weeks, starting 15-July-2007. The majority of the 3645 responses were in the first week, with greatest response volume during the two days the advertisement was on *www.Facebook.com*, 18-19 July. Responses came from 92 countries; the number of responses to each survey version is given in TableAIV.1. Due to the distribution method, a response rate is not calculable.

The high number of responses yielded flexibility in the quality of data analysed and improved statistical significance in modelling. Heterogeneity and representativeness are discussed in the next section.

IV.ii) Data Refinement

The dataset was reviewed and refined using Excel®. Subsequent distribution fitting and statistical analyses were conducted using Stata10.0® and SPSS14.0® software. Decisions concerning data refinement and some data analysis were in conjunction with Håkon Sælen. Victoria Prowse provided assistance in Stata use and modelling techniques.

Specifically, 505 responses were ignored based on irrational responses to questions in Survey_Section_6: Time. This decision was in line with the Barsky's analysis (1997), upon which questions in Survey_Section_6 were initially formulated. These irrationalities were of two kinds: TypeI.inconsistency with utility maximisation theory and TypeII.implication of negative η.[16] Of these responses, 52 displayed both types of irrationalities. TableAIV.2 gives the breakdown by survey version for the number of responses removed.

The response profile for respondents indicating Age>90 or Household_Members>10 was altered. This age cut-off was determined according to internet-users profile information (Nie, 2002). These responses were assigned as missing data in the overall respondent profile, as the nonsensical answers provide no more information than a skipped question. The use of radio-buttons and dropdown menus for the majority of questions in the *CES* reduced the need to alter or ignore nonsensical user input.

[16] Mathematically, there is limitation on $\eta<1$. In order for there to be equity in growth between consumption and net benefits thereof, the condition: $\eta g+\delta>g'$, where g is consumption growth rate and g' is growth rate of net benefits, must be limited into the future subject to $\delta>(1-\eta)g$. Thus, there are implicit modelling problems if $\eta<1$. Equations14&15, "Appendix on the Ethical Frameworks and Intertemporal Equity," *Stern Review*.

IV.iii) Descriptive Statistics: Independent Variables

This section discusses independent variables that may show bias from the distribution method employed for the *CES*, specifically demographic indicators from Survey_Section_7. ChapterVI. discusses independent variables in the context of their relationships to one another and the measured dependent variables. Many independent variables are qualitative in nature and have been assigned ordinal values (TableAIV.3); thus, relative frequencies, median, and modal information meaningfully categorise these data.

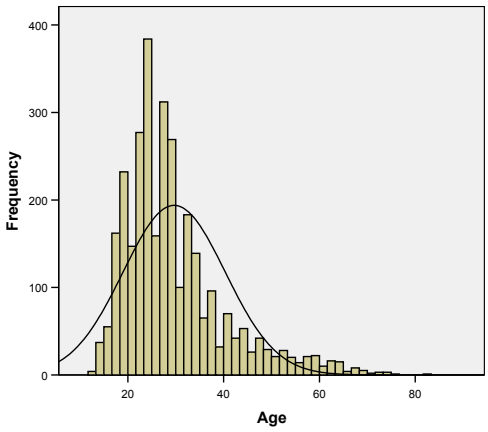
Due to the large sample size, quantitative independent variables tend to follow a normal distribution.[17] (FigureIV.1:Example for Age) Yet, they are normally distributed with attributes representative for the world population (i.e. mean), but from the overall population from which they were drawn.

In previous experimental work, age distribution has been uniformly grouped well-below middle-age (i.e. Cameron and Gerdes, 2007) or well-above middle-age (i.e. Barsky, 1997). The average respondent age for the *CES* was 29.7(s.d. 10.7);[18] with maxima and minima at 13 and 83 years. The mode was 24.0 years with median=27.0. The median age in the developing world (2000) was 24.3 years in and in the developed world it was 37.3 years (UN, 2004). Responses to the *CES* were world-wide, but the majority of responses were from developed countries, and accounted for the minimum and maximum age spread. Interestingly, responses from countries classified as developing yielded an average age of 29.8.[19]

[17] This is in adherence to the Central Limit Theorem.

[18] The associated 95% confidence interval is [29.3, 30.04].

[19] Based on responses from Africa, Latin America, South Asia, and the Middle East. 95% confidence interval:[28.6,31.01].



FigureIV.1

Education_Level and Employment_Status provide insight given the age spread and the high mean in the developing country sub-sample.[20] 44.09% of respondents have obtained a college or university degree, and a further 30.86% have completed a Post-Graduate degree.[21] Additionally, 30.07% of respondents are currently students; though 53.90% of the sample is employed full-time in either public- or private-sector. Similar divisions are seen for all country cohorts.

Of current students, only 63.80% indicate being in Income_Bands 0-4 (accounting for incomes from <£10000-£49999).[22] It seems unlikely that just under a third of student respondents are making over £50000 annually, provided that the average income for high income OECD countries is about £20000 (World Bank, 2006). There are cases in which older people return to school; some students may be supported by a working spouse, but these explanations cannot account for all cases of students with reported high household income. A chi-squared test allows the null hypothesis of no relationship between Income_Bracket and

[20] Comparison to global expectations.

[21] Includes Masters, PhD, Medical and Law degrees.

[22] In developing country cohorts the pattern was the similar though the numbers reflect those given for developing countries.

Employment_Status to be rejected (significance=0.05) but the reported Kendall's Tau-B[23] correlation is of low magnitude (0.110,s.e.0.014).

78.9% of students reported not being the Primary_Provider in their household. The Kendall's Tau-B correlation is of low, but significant magnitude (0.212,s.e.0.016). The average respondent household size was 2.95(s.d.1.51) people with maxima and minima reported at 1 and 10. 15.0% of students report a one-person household, while 78.1% of students live in 2-5 people households. Household_Member distributions were tested between the full-time employment cohort and that for students using t-tests. At the 0.05 significance level, a one-way ANOVA test shows that the distribution for all cohorts differ significantly.[24] Cowell and Gardiner (2006) found similar patterns in their independent variables for student respondents. It is unclear whether students answered questions of primary household provider, size, and income based upon their household arrangements at university or their parents' household.

To control for in-sample bias, respondents were asked if they were environmental or conservation group members. 27.8% of respondents answered affirmatively. It is difficult to determine whether there was pre-existing interest in the topic or if respondent interests were peaked by the survey. For instance, 49.65% of respondents clicked on a link for more survey information and 28.0% provided an e-mail address.

[23] Test of strength of association for cross tabulations, adjusting for ties in data when both variables are ordinal.

[24] The null cannot be rejected for difference between households where the respondent is full-time private and full-time public.

CHAPTER.V

Data Analysis/Discussion:

Risk vs. Inequality and Time

V.i) Risk and Inequality: Frequency Distributions

During survey development, there was recognition that individuals show preferences heterogeneity over questions of risk and inequality of different magnitudes and concerning different actors. Therefore, attitudes towards both risk and inequality were elicited on different levels.

Respondents had the option to not answer every question; the aggregate responses varied between categories for: 1.National_Inequality(NI); 2.Global_Inequality(GI); 3.Social_Risk(SR); and 4.Individual_Risk(IR). (TableV.1.)

	National_Inequality(NI)	Global_Inequality(GI)	Social_Risk(SR)	Individual_Risk(IR)
Responses	2813	2779	2753	3012

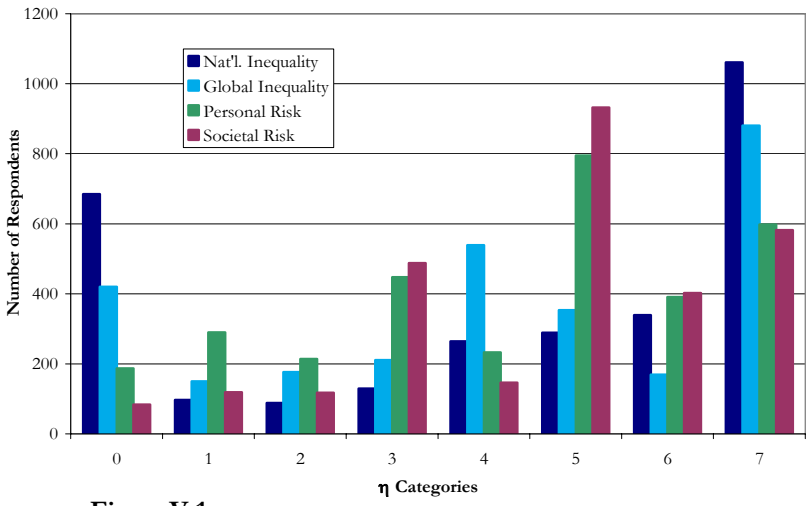
TableV.1.

Described in ChapterIII, question response patterns enabled each respondent to be placed into a distinct category for their valuation of η under isolation for each of: NI, GI, SR, and IR. This categorisation was based on interval censored data, reflecting uncertainty over point estimates for η. Frequencies for each η range is given in TableV.2. (Cumulative frequency Tables:TablesA.V.1-2) The η categories were both right-censored and left-censored (η Categories 0&7). Thus, theoretically, the lowest response could be $\eta=-\infty$ and the highest, ∞. Consequently, calculating mean values directly from the data is impossible.

		Frequency(%)			
Category Number	**Range**	**NI**	**GI**	**SR**	**IR**
0	**$\eta < 0.5$**	23.0	14.3	5.9	2.9
1	**$0.5 < \eta < 1.0$**	3.4	5.4	9.0	4.1
2	**$1.0 < \eta < 1.5$**	3.0	6.0	6.8	4.1
3	**$1.5 < \eta < 2.0$**	4.4	7.1	14.3	17.0
4	**$2.0 < \eta < 3.0$**	8.7	18.3	7.5	4.9
5	**$3.0 < \eta < 5.0$**	9.6	12.3	25.2	32.3
6	**$5.0 < \eta < 7.5$**	11.6	5.8	12.2	14.1
7	**$7.5 < \eta$**	36.4	30.7	19.1	20.5

TableV.2.

Frequency distributions for: NI, GI, SR, and IR are directly comparable since they are measured along the same ordinal scale. This was done visually by overlaying the four plots on a single graph (FiguresV.1&V.2). (FiguresAV.1-4: individual frequency graphs.) Additionally, a two-sample Komogorov-Smirnov Test was run for each pairing of the four dimensions determining if the two underlying one-dimensional probability distributions differed.[25] (TableAV.3) Reported K-S D-values and associated Z-scores indicate all four distribution frequencies differ significantly (significance=0.05) from one another.

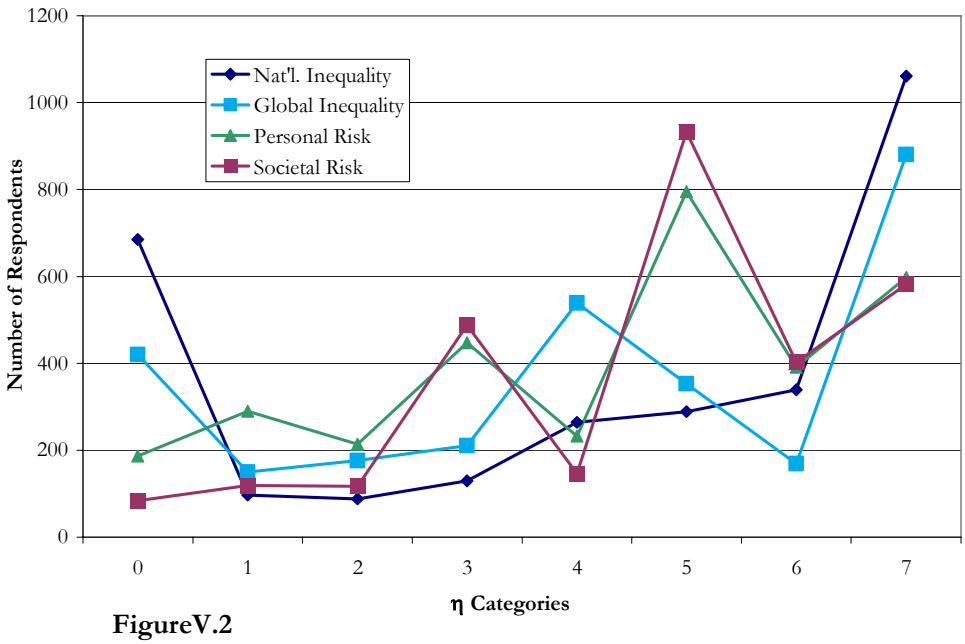


FigureV.1

[25] Test is commonly used for ordinal data, and is accurate for large samples (Massey, 1951).

V.ii) Risk and Inequality: Fit Distributions

Two options to fit grouped data is suggested by literature: 1.assign upper and lower boundaries for η and test this assumption for robustness; 2.assume that response frequencies for η reflect a normal distribution type and fit and test such a distribution. The first method was used by Johansson-Stenman (2002); a considerable share of their results was in the high and low range unbounded categories, similar to the division of *CES* responses. In this study a distribution type was assumed, rather than defining arbitrary end points.[26]



FigureV.2

Maximum-likelihood estimation was used to fit a lognormal distribution based on observed frequencies in each category. (TableV.3). This model assumes that the latent variable, y*, is lognormally distributed (Greene, 2000). To fit the data, the η ranges were redefined in terms of 1/η. The initial response category definitions were based on measurements of: 1.RRA (IR&SR) and 2.relative inequality

[26] Given high frequency of responses in unbounded categories(0&7), there appeared no manner by which to assign end-points without influencing statistical outcome.

aversion (GI&NI), both defined as η. Theoretically, RRT and relative inequality tolerance, both represented by $1/\eta$, are lognormally distributed, and subsequently provide a normal-distribution to which to fit the data based on theory. Given the lognormal distribution's nature, an upper bound=1000000 is not significantly different from ∞ and a lower bound=0.00000001, not significantly different from zero.

RRT ranges (= 1/RRA = 1/η)			**Category Frequencies**			
Category	**U (upper bound)**	**L (lower bound)**	**NI**	**GI**	**IR**	**SR**
0	1000000.00000000	2.00000000	0.2300	0.1429	0.0591	0.0291
1	2.00000000	1.00000000	0.0345	0.0543	0.0900	0.0414
2	1.00000000	0.66666670	0.0295	0.0605	0.0684	0.0414
3	0.66666660	0.50000000	0.0444	0.0709	0.1428	0.1696
4	0.50000000	0.33333330	0.0867	0.1832	0.0750	0.0494
5	0.33333333	0.20000000	0.0956	0.1234	0.2517	0.3233
6	0.20000000	0.13333330	0.1155	0.0583	0.1218	0.1406
7	0.13333330	0.00000001	0.3637	0.3066	0.1912	0.2052

TableV.3.

Non-linear least squares regressions on the probability of observing each category within the response set(frequencies) estimated true values for μ and σ. This algorithm was followed for: NI, GI, IR, and SR (see OutputAV.1 for full output and specifications):

nl(IR=normal((ln(U)- μ)/σ)−normal(ln(L)- μ)/σ), initial μ=1 σ=2)[27]

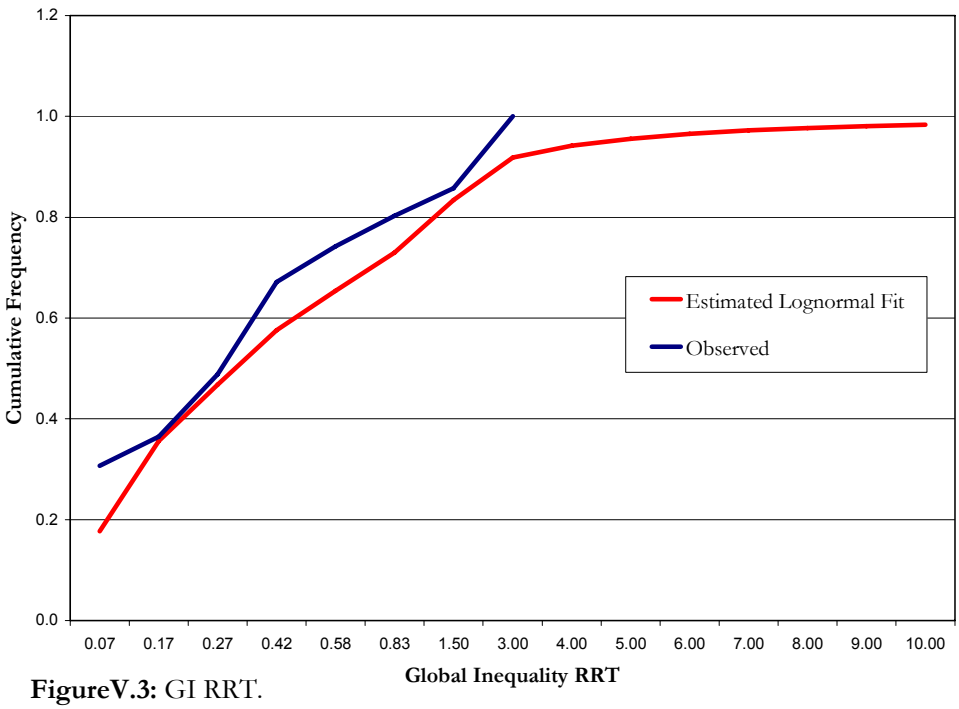
Estimated parameters are given in TableV.4. The high response frequency for NI&GI in the unbounded categories (0&7), skews models based on a lognormal distribution. In opposition, high frequency occurred only in category 7 for SR&IR. Each of the four lognormal model specifications reported high-level goodness-of-fit (R^2>0.80); however, a mathematical check suggests that the fits for IR&SR are reasonable, while high R^2 reported for NI&GI were likely driven by fit of σ rather than μ due to the long

[27] Regardless of user assigned starting estimates for μ&σ, Stata returns values best fit to the data (Prowse per.comm.).

right-tail. Massey (1951) suggests that plots of empirical by theoretical cumulative distribution functions are the best check for fit. (FiguresV.3-6)

Estimated Lognormal Parameters	NI	GI	IR	SR
μ	-1.19888	-1.18797	-1.17125	-1.39469
σ	2.47973	1.64167	1.00887	0.77395
R-Squared	0.9648	0.9308	0.9137	0.8564
Mean_Tolerance (Estimated)[28]	3.37607	1.65237	0.81889	0.54741
Median_Tolerance (Estimated)	0.30153	0.30484	0.30998	0.24791

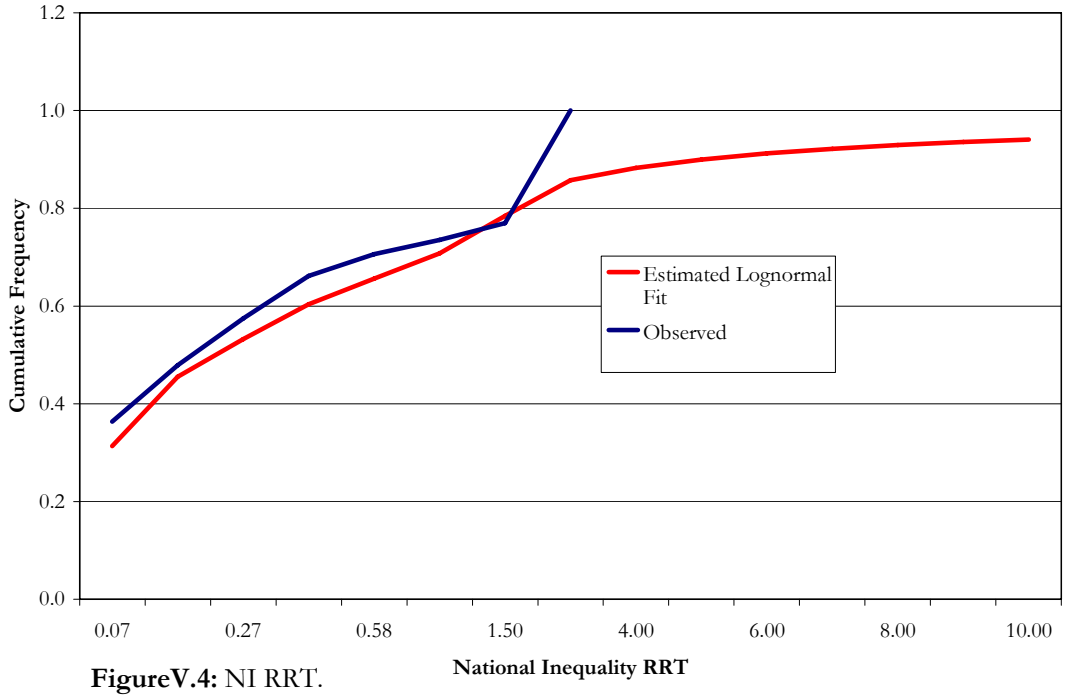
TableV.4.



FigureV.3: GI RRT.

[28] Reported μ value for a lognormal distribution is the mean of the latent variable's logarithm. For the true sample:

Mean= $e^{\mu} + \frac{\theta^2}{2}$; Median= e^{μ}



FigureV.4: NI RRT.

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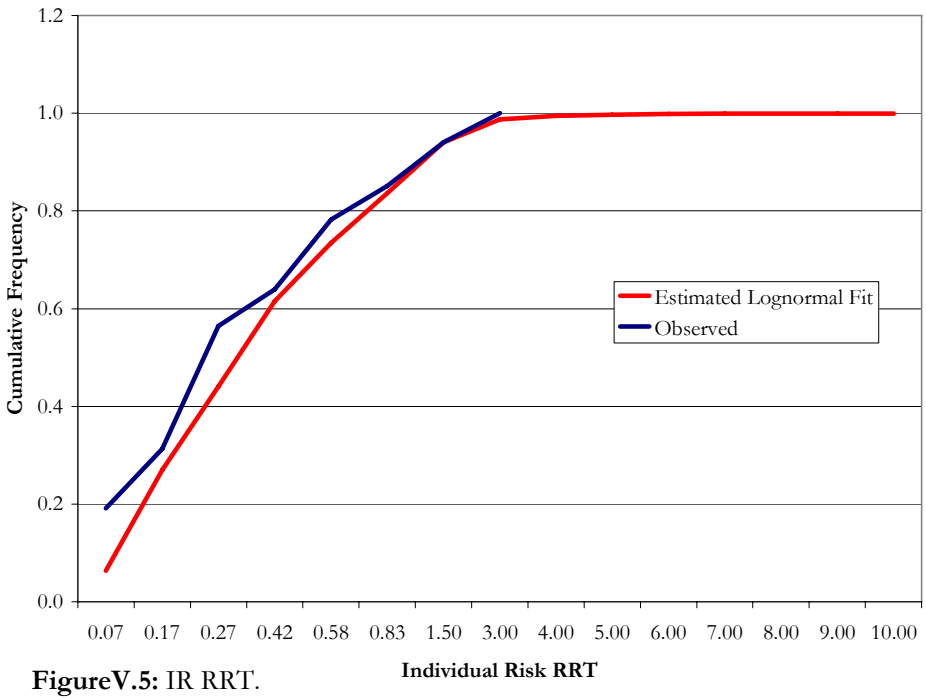
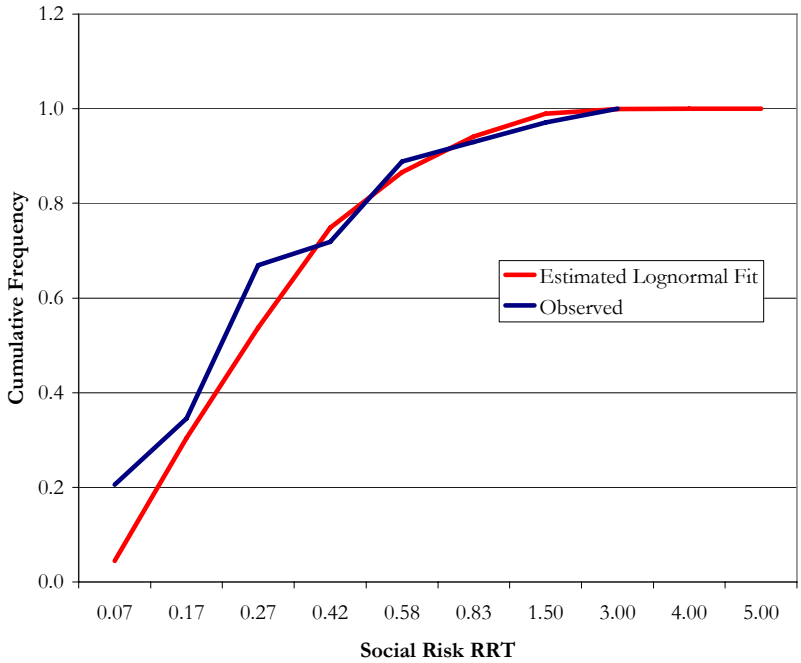


FigureV.5: IR RRT.



FigureV.6: SR RRT.

Monte Carlo simulations were run in order to get a point estimate of mean values in each η category based on reasonable fits estimated for SR&IR (OutputAV.2); however, iteration limitations imposed by Stata did not yield robust estimates.

V.iii) Time Responses

The possible consumption path combinations in Survey_Section_6: Time results in responses that cannot be grouped into uniform non-overlapping categories in the same way as responses for: IR, SR, GI, and NI. For each of the 2459 valid responses[29] possible elasticities of intertemporal substitution ($1/\eta$) ranges were calculated as described in ChapterIII.iv.vi, based upon the variation in slope between an individual's consumption path choices. Frequencies for upper, lower, and midpoint estimates are available in TablesAV.4-6. The majority of respondents (95.30%) have low elasticities of intertemporal substitution ($0<(1/\eta)<0.510$). The average of the estimated lower bounds of the intertemporal elasticity of substitution is very close to zero, while the upper bound just exceeds one. The modal time preference is for consumption paths with slopes close to zero; regardless of the implied interest rates, individuals tended to choose Option *C*, the flat consumption path regardless of implied interest rate. There is considerable heterogeneity in individuals' elasticities of intertemporal substitution; the maximum value is 2.88. Thus, the range of midpoint estimates for tolerance of intertemporal substitution follows that implied by log utility, but the frequency distribution does not.[30]

	Lower	Upper	Midpoint
Mean	0.055239	0.448399	0.251637
Median	0.000000	0.206978	0.113633
Mode	0.000000	0.141511	0.070755

TableV.5

The elasticity of intertemporal substitution's reciprocal gives a value for η[31] along the time dimension. These point estimates for intertemporal substitution aversion were placed into the eight categories defining individuals' η ranges. (TableV.6/FigureV.7-8)

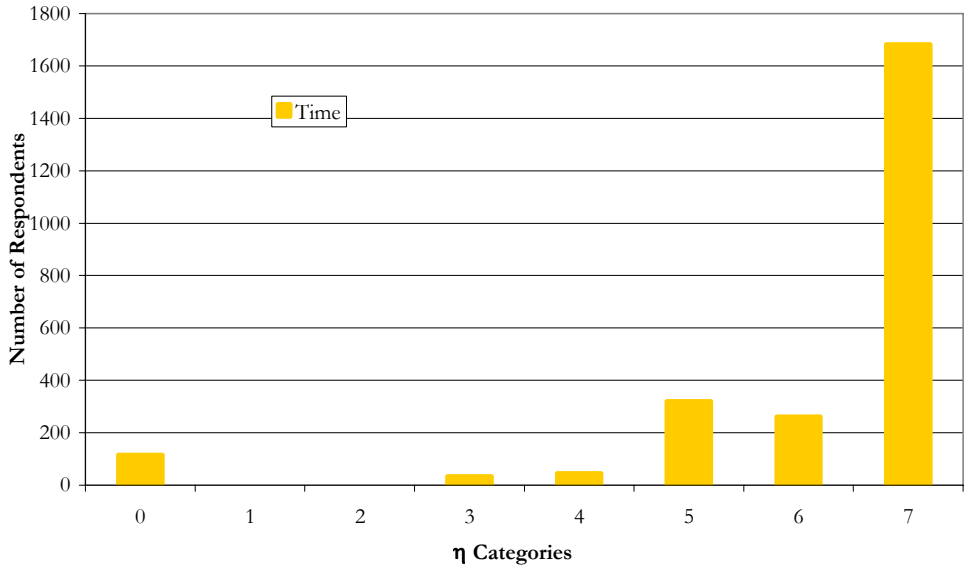
[29] 66 respondents indicated consumption paths in which direction of intertemporal tolerance was indistinguishable.

[30] Responses for time were fit to lognormal using the same method in Section V.ii. (See OutputAV.3) μ=-2.508349; σ=1.012711. mean=0.594183; median=0.081403

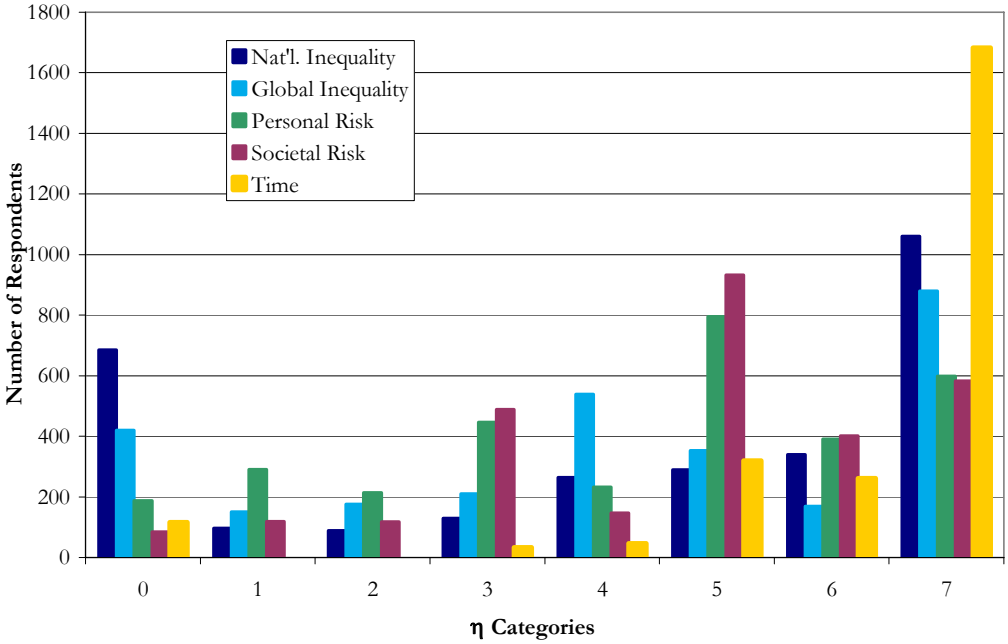
[31] Due to Jensen's inequality this does not yield an exact value of η.

		Time	
Category_Number	**Range**	**Frequency(%)**	**Cumulative_Frequency(%)**
0	$\eta < 0.5$	4.72	4.72
1	$0.5 < \eta < 1.0$	0.00	4.72
2	$1.0 < \eta < 1.5$	0.00	4.72
3	$1.5 < \eta < 2.0$	1.34	6.06
4	$2.0 < \eta < 3.0$	1.87	7.93
5	$3.0 < \eta < 5.0$	13.01	20.94
6	$5.0 < \eta < 7.5$	10.65	31.60
7	$7.5 < \eta$	68.40	100.00

TableV.6



FigureV.7: Time response frequencies based on η bounds initially established for:IR, SR, NI, and GI responses.



FigureV.8: Comparative frequencies for η categories for all dimensions of η.

V.iv) Correlations: Risk, Inequality, and Time

It is not possible to get point estimates for individuals' η valuation along the risk and inequality dimensions. However, it is possible to use the fit risk parameters and inequality tolerance distributions in SectionV.ii. as point comparisons to the median point estimate available for intertemporal substitution. (TableV.7.)

There is a considerable gap in the median tolerance for intertemporal substitution in comparison with the dimensions of risk and inequality. Not surprisingly, median values for NI&GI are barely distinguishable. Yet, the distance between the median values for SR&IR is surprising given the similarity between the median IR tolerance and those calculated for NI&GI. These point estimates are substantiated by past research findings. Cowell and Gardiner (1999) find that elasticity of inequality tolerance ranges from 0.20 to 0.79 and Barsky (1997) reports a mean risk tolerance=0.24 and a mean elasticity of intertemporal substitution=0.18.

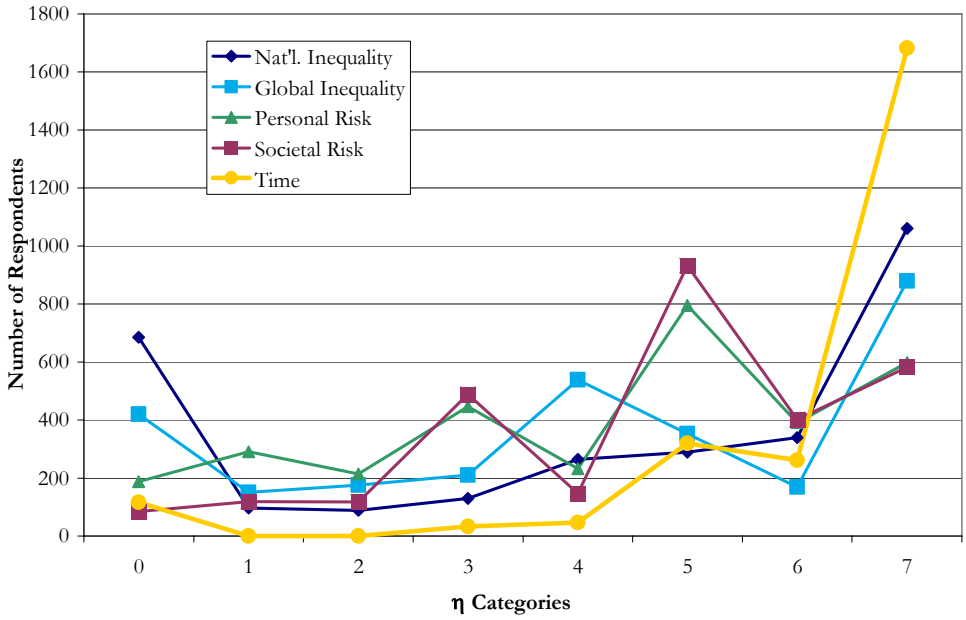
	Median Tolerance
Social_Risk	0.24801*
Individual_Risk	0.30998*
Global_Inequality	0.30484*
National_Inequality	0.30153*
Time	0.11363

TableV.7.: *estimated value

It is useful to consider ties between the ranges for η in each dimension as this is the highest level to which information is available for: IR, SR, NI, and GI, avoiding all researcher inferences. The highest respondent density are in the most RRA category (7), with η>7.5 for NI, GI, and time[32], while the modal response for both IR&SR is consistent with 3.0< η<5.0. The median and modal categories based upon

[32] TableAV.7:comparative frequencies for risk, inequality, and time.

answers for the entire sample are given in TableV.8. Median and modal responses were also calculated for some sample sub-groups based on quartile measures for Age, Country_of_Residence, and reported attitudes towards climate-change and politics. There was minimal variation between the central tendencies for the overall sample and these subsamples. (TablesAV.8-10)



FigureV.9

	SR	IR	GI	NI	Time
Median	5	5	4	5	7
Mode	5	5	7	7	7

TableV.8.

It is straightforward to meaningfully test for correlation across the η categorisation between dimensions. Reported correlations were calculated using Kendall's Tau-B.[33] (TableV.9.) (TableAV.7 gives comparative frequencies for all dimensions.)

[33] Kendall's Tau and Spearman's-Rank (both non-parametric) are considered the same as ordinal measures of correlation in spite of different metrics (Gilpin, 1993).

		NI	GI	IR	SR	Time
NI	Correlation_Coefficient		**0.510061**	**0.196625**	**0.128621**	**0.124851**
	Sig.(2-tailed)		0.000001	0.000001	0.000001	0.000001
GI	Correlation_Coefficient	**0.510061**		**0.173005**	**0.132955**	**0.124564**
	Sig.(2-tailed)	0.000001		0.000001	0.000001	0.000001
IR	Correlation_Coefficient	**0.196625**	**0.173005**		**0.439682**	**0.138720**
	Sig.(2-tailed)	0.000001	0.000001		0.000001	0.000001
SR	Correlation_Coefficient	**0.128621**	**0.132955**	**0.439682**		**0.092495**
	Sig. (2-tailed)	0.000001	0.000001	0.000001		0.000001
Time	Correlation_Coefficient	**0.124851**	**0.124564**	**0.138720**	**0.092495**	
	Sig.(2-tailed)	0.000001	0.000001	0.000001	0.000001	

TableV.9.

Some correlation is expected between dimensions; however, the source of stronger correlations between some pairs is debatable. This strength of correlation for GI, NI, SR, and IR show that individuals think similarly on these issues, but could also reflect some bias in the survey questions. Both survey question sets addressing inequality were very similar to one another as is the case for the question sets addressing risk. There is a great deal of scope for learning effects, especially with the graphical interface of the inequality sections. The high correlation between IR&SR may be partially accounted for by the fact that the question wording between sections differed but the numeric choices remained the same.[34]

The correlation for time and all other dimensions is very weak. This indicates that time is the dimension most 'differentiated' among the three. One must consider the possibility of measurement error since responses for time were post hoc classified into the eight categories rather than directly measured in that metric. However, there are similarly weak correlations between each dimension of risk paired with each inequality dimension.

[34] Necessary to allow responses to be categorised into η categories with the same boundaries.

If the η measured dimensions followed the standard economic framework, correlation coefficients would be expected to show perfect monotonicity, with value of one. There is statistically significant correlation reported between each pair, but for the majority of pairings, the correlation is classified as weak.[35] Thus, risk, inequality, and time attitudes as represented by η are correlated, but not identical, as is advocated by the classical theory of assigning a uniform $\eta=1$ valuation.

[35] Cohen (2004) designates correlation strength on the scale:0.5:large; 0.2:moderate; 0.1:small.

CHAPTER.VI

Data Analysis/Discussion:

Attitudes Towards Risk

This chapter examines the effect of heterogeneity in attitudes and demographics that may predict individuals' risk tolerance levels. The main focus is on variation between IR&SR as evidenced by variations in independent variable valuations.

VI.i) Ordered Probit Model

The Ordered Probit model (OPM) is useful when the dependent variable takes a finite number of orderable outcomes. In an OPM, association between dependent and independent variables are not restricted to linearity, providing improved association measures, as it is likely that non-linear relationships exist in the *CES* data.

This model is built around a basic latent regression form:

(18) $y^* = x'\beta + \varepsilon$,

y* is the unobserved parameter, x' is observed independent variable, and ε encompasses unobservable factors, which are assumed to be normally distributed across respondents. The OPM is probability-based and uses maximum-likelihood to estimate the chance that an individual with given characteristics falls within an observed category. A separate OPM was developed for each dimension of η: IR, SR, NI, GI, and time. The dependent variable specification in these models is based on categorical definitions following from the 8 η categories.

Observed (y)	Known η range	Range of y*(OPM)
0	$\eta < 0.5$	$Y^* < \mu_0$
1	$0.5 < \eta < 1.0$	$\mu_0 < y^* < \mu_1$
2	$1.0 < \eta < 1.5$	$\mu_1 < y^* < \mu_2$
3	$1.5 < \eta < 2.0$	$\mu_2 < y^* < \mu_3$
4	$2.0 < \eta < 3.0$	$\mu_3 < y^* < \mu_4$
5	$3.0 < \eta < 5.0$	$\mu_4 < y^* < \mu_5$
6	$5.0 < \eta < 7.5$	$\mu_5 < y^* < \mu_6$
7	$7.5 < \eta$	$\mu_7 < y^*$

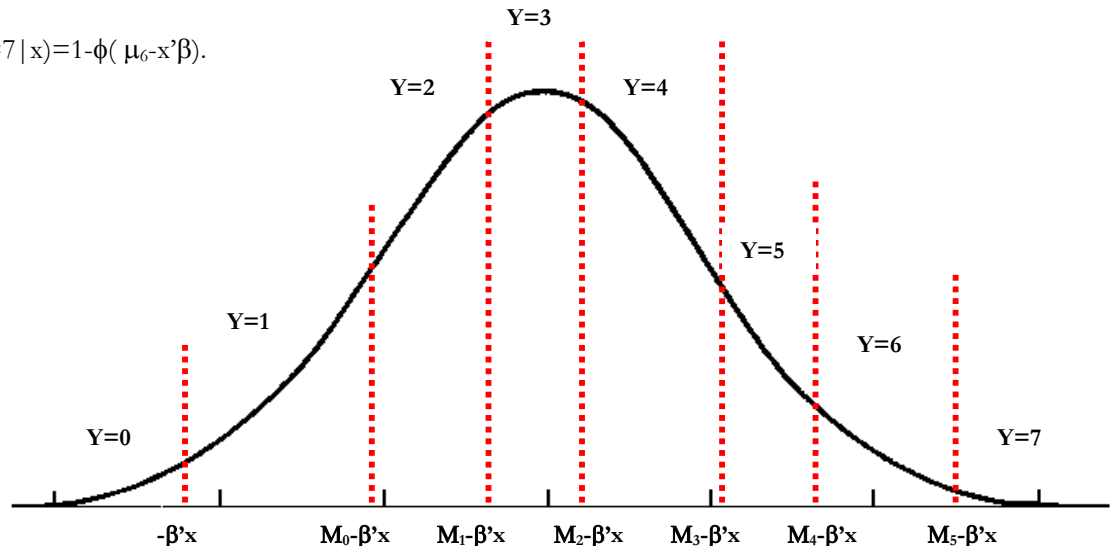
TableVI.1

For 6 η categories (1-6) width and categorical end points are known, but they cannot be specified under the assumed structure of OPM calculations. The μs defining category boundaries (TableVI.1) are taken by the OPM to be unknown parameters that are estimated with β in (18) above. Thus, the following probabilities define the OPM:$P(y=0|x)=\phi(-x'\beta)$;

$P(y=1|x)=\phi(\mu_0-x'\beta) - \phi(-x'\beta)$;

$P(y=2|x)=\phi(\mu_1-x'\beta) - \phi(\mu_0-x'\beta)\ldots$

$\ldots P(y=7|x)=1-\phi(\mu_6-x'\beta)$.



FigureVI.1:OPM theoretical boundaries.

In practice, the OPMs for IR, SR, GI, NI, and time are defined by independent variable groupings, discussed in the following section.

VI.ii) Risk Indicators–Dummy Variables

There were two explanatory variables genres in the *CES*: 1.attitudes (Survey_section_1) and 2.demographics (Survey_section_7). (TableVI.2) To allow for the greatest joint-explanatory power all of these variables were included in the OPM. The qualitative factor effects were represented by dummy variables. This is straightforward in most cases; i.e. Education_Level and Employment_Status are not interval measurements and must be assigned representative values for individuals showing certain characteristics.

Dummy variables were used in this model specification for some variables that can theoretically be interpreted on an interval scale. This is true of Income_Brackets measured on a censored scale with indeterminable end-point values. Though the Likert-scale is accepted as an interval scale in some cases (deVaus, 1986); assigning dummy variables to individuals' attitudes towards climate-change and politics absorbs ambiguity as to how different individuals interpret Likert-scale answers.

Dougherty (2002) suggests the most dominant or *normal* category as a reference for each explanatory variable group. Reference categories for each demographic category were chosen based on the *most representative respondent* from reported mean and median values. For responses based on the Likert-scale, such as concern over climate-change, the most neutral category was chosen as a reference. To ensure individual profiles were not ignored completely by Stata, dummy variables were created for missing data in each explanatory variable. TablesAVI.1-3 provides dummy variable specification and reference categories.

Demographic_Indicators	Attitudinal_Factors
Country_of_residence	Smoking_Habits
Education_Level	Lottery_Playing
Employment_Status	Seatbelt_Wearing
Gender	Political_View
Household_members(interval_data)	Financial_Risk_Taking
Number_of_Children	Climate_Change_Attitudes(self-reference)
Income_Bracket	Climate_Change_Attitudes(world-reference)
Age(interval_data)	
Primary_Household_Provider	

TableVI.2.

.

VI.iii) Individual vs. Social Risks: OPM Regressions

One is interested in the Marginal Effect (ME) of a change in the independent variable on the probability of the dependent variable taking a certain value. For continuous variables, MEs are given by the partial derivative of an independent variable unit change, holding all other variables constant. For dummy variables, MEs result from a discrete change in the variable from zero to 1. A caveat to the OPM is the magnitude and direction of discrete change depends on the level at which other model variables are held constant. Conventionally, one reports the MEs' average over all probable outcomes not the ME at the average; but in a large sample, these are equal (Prowse, 2007).

The researcher generated OPM MEs two ways: 1.holding independent variables at their average and 2.holding continuous independent variables at their average values and dummy variables at zero. Anderson and Newell (2003) advocate the second method to compute MEs corresponding directly to the reference groups for which they were originally coded.

In-sample bias is acknowledged, but source and pattern is not easily determinable as discussed in ChapterIV.iii. Cross tabulations were generated to explore the nature of biases and to determine the validity of bootstrapping a "representative" population sample or weighting the sample responses based on some criteria. Available data for the global or UK population average does not correspond well with the manner in which explanatory variables were initially designed in the survey. Additionally, test weights for Education_Level yielded little differentiation in ME magnitude. These weights show no effect on median or modal risk aversion over IR&SR. The correlations between IR, SR, NI, GI, and time are affected minimally in both directions.[36] Weighting for multiple factors introduces a great deal of model subjectivity (deVaus, 1986). Thus, reported regressions were run using the entire sample population.

The following sections discuss the independent variable MEs on the probability that a representative individual falls within given RRT (η) categories (y=0-7) for both individual and societal-level risks.[37] The

[36] Results for weighting based on Education_Level for representative UK sample:TableAVI.4.

[37] Recall: $Y=0 \rightarrow \eta<0.5 \rightarrow$ most risk tolerant; $Y=7 \rightarrow \eta>7.5 \rightarrow$ least risk tolerant category.

representative individual is defined by the dummy variable reference categories and referred to as *the agent*. MEs at categories 0&7 are of great interest, as the extreme boundaries of RRT. Yet, category 5 captures the greatest respondent density for IR&SR, and may identify attributes that influence likelihood towards a "societal norm" RRT value for IR&SR.

VI.iv.i) Demographic Indicators: IR

Effective demographic indicators for IR are: Income_Bracket, Employment_Status, Education_Level, Number_of_Children, Country_of_Residence, and gender as indicated by significant MEs. (OutputAVI.1)

Relative to the omitted Income_Bracket category (£40000-£49999), there is evidence that RRA for IR is weakly U-shaped in income. Those in Income_Brackets 0-6 show greater likelihood towards RRA behaviour; once the agent has income>£70000; he shows a change in probability, consistently indicating more RRT behaviour. For instance, there is a very low probability (5.48%) that a representative individual has a valuation of $\eta<0.5$ (most RRT). Yet, this probability is reduced by 2.5% for an individual maintaining all other representative qualities, but in Income_Brackets 0-1. The agent has the greatest chance of $3<\eta<5$ (26.7%), to which there are not significant MEs from income changes. The ME direction from a change in Income_Bracket, reverses between $2<\eta<3$ and $3<\eta<5$ and becomes statistically significant for $5<\eta<7.5$. Thus, as the agent changes Income_Bracket in a positive direction, probability of being classified in a given η category it is not defined by increased RRT until he reaches a threshold income of >£70000.

Employment_Status shows consistent statistically significant ME on the agent's likelihood to display the greatest, least, or modal level of IR RRA. A change to self-employment yields an increase of 2.7% to the 5.48% chance that the agent is categorised by $\eta<0.5$; while the same change in employment yields a 4.1% reduction to the 14.0% chance that the agent is classified $\eta>7.5$. Student classification has the same directional effect as self-employment with reduced magnitude. However, a move from the private-sector to either public-sector or retirement shows significant increases in the likelihood of the most RRT behaviour. Of note is the 12.58% increase in the base 14.01% chance that the representative agent is classified by $\eta>7.5$ from the isolated change to retirement.

A change in the agent's Education_Level has significant MEs for limited educational categories. Having not finished high school consistently increases RRT; this discrete change decreases chances of $\eta<0.5$

by 2.04%, while increasing the chance of $\eta>7.5$ by 5.48%. In the survey sample there are individuals who are too young to have finished high school yet, while there are others who are drop-outs; thus, the origin of this ME is ambiguous.

A change in Number_of_Children is associated with statistically significant MEs, uniformly in the direction of increased likelihood for greater RRT. If the agent has zero children, the direct effect of a change to one child is greater in magnitude than the additional effects of subsequent increases in Number_of_Children. The birth of a first child decreases the agent's chance of $\eta<0.5$ by 2.33%, while increasing the chance of $\eta>7.5$ by 6.59%.

Country_of_Residence strongly predicts RRT; a change in the agent's residency from the UK to Latin America makes him 4.68% more likely to have $\eta<0.5$ and 6.04% less likely to be characterised by $\eta>7.5$. There is a similar effect associated with a change from the UK to Southern Europe; the agent is 6.04% more likely to be characterised by $0.5<\eta<1.0$ and 7.76% more likely to have $\eta>7.5$.

Gender has a strong ME in all categories. As a woman, the agent is always much less RRT. A change in gender yields a 2.95% reduction in the chance to have $\eta<0.5$ and a 6.49% increase to have $\eta>7.5$.

Age, shows a significant, but weak ME on IR RRT. The agent is assigned the mean sample age of 29.67. It is unlikely that a one-year increase at this age has the same effect as a one year increase at other ages. Life circumstance, rather than aggregate years of life may be a better indicator. For instance, Employment_Status was highly predictive of a change in η category.

VI.iv.ii) Attitudinal Indicators: IR

IR RRT is strongly U-shaped in political attitudes; *liberals* are more RRT. A change in the agent from a neutral-stance to ultra-liberal indicates a 1.80% decrease in chance to have $\eta<0.5$ and 4.64% increased chance for $\eta>7.5$. The opposite change, from neutral to highly-conservative, indicates a 7.20% increase in chance for $\eta<0.5$ and a 7.81% decrease in chance for $\eta>7.5$.

Lottery_Playing has the opposite effect than expected; as the agent plays more frequently, the ME reduces RRT. If the agent plays weekly, there is a 2.06% reduction in likelihood for $\eta<0.5$ and a 5.55% increase in chance for $\eta>7.5$. This finding is consistent with Cowell and Gardiner (2001) and exemplifies variation in individual attitudes depending on the level of upfront risk assumed.

Reporting oneself as a 'Financial_Risk_Taking' is strongly associated with increased RRT. A change in the agent to Financial_Risk_Taking yields a 6.51% increase in chance for $\eta<0.5$ and a 7.38% decrease in chance for $\eta>7.5$. 38.28% of those reporting to be Financial_Risk_Taking are also self-employed or students; there is a correlation with employment status.

As the agent is more concerned with climate-change effect to himself, the likelihood of IR RRT decreases. Surprisingly, there is the opposite effect at a statistically significant level as the agent increases in concern for climate-change effects on the world. A 6.95% increase in chance for $\eta>7.5$ is associated with an agent change to high concern for the personal effects of climate-change, while a 4.11% decrease in the chance for $\eta>7.5$ as the agent changes to highest concern for world effects of climate-change. This indicates individuals see personal and societal risks differently.

The following sections discuss demographic and attitudinal effects on the agent's level of SR RRT and compares these factors between IR&SR.

VI.v.i) Demographic Indicators: SR

The effective demographic indicators on the MEs of probability for SR RRT trends are: Country_of_Residence, gender, Income_Bracket, and Education_Level. (OutputAVI.2).

The pattern for Country_of_Residence is similar to that for IR RRT; a change to Latin America from the UK consistently indicates a statistically significant ME towards increased RRT. This same directional change is seen for a change to Southern Europe, but is not significant in all η categories. The 17.73% chance the agent has to be classified by $\eta>7.5$ is decreased by 7.76% for a change to Latin America and 8.20% for a change to Southern Europe.

Gender creates significant MEs; as a female the agent becomes more RRA in all categories. The female agent is 1.24% less likely to be classified as $\eta<0.5$ and 6.91% more likely to have $\eta>7.5$.

RRT in SR is not as strongly U-shaped in Income_Bracket as for IR, but does show significant effects for a change in agent to Income_Bracket=0. There is a weak ME towards reduced RRT for all changes in income, except for levels between £70,000-£139,999.

A change in the agent's Education_Level to a lawyer, indicates that there are significant positive MEs, increasing the likelihood that he classified by $0.5<\eta<3.0$, but reduces the chance of having a valuation of η in either extreme category.

VI.v.ii) Attitudinal Indicators: SR

The effect of a change in Politcal_Attitude is not as strongly U-shaped as it was for IR. Statistically significant MEs are seen only for a change in agent attitude to ultra-liberal. Though weak, the MEs of all Political_Attitudes show a tendency towards reduced RRT. A weak inference can be made that regardless of political view, one has a tendency towards RRT for SR.

Attitudes towards climate-change concern for oneself and concerns for the world in the same direction are observed to cause MEs of opposite signs. This is weaker for SR than it was for IR, and is not observed in probabilities for the most extreme η categories.

The ME of the agent becoming Financial_Risk_Taking is associated with increased RRT for the more extreme η categories. This change is has a ME of 2.20% higher chance that the agent is classified by $\eta<0.5$ and a 6.02% reduction for $\eta>7.5$.

VI.vi) Social Risk and Individual Risk

The differences between factors showing significant MEs for IR&SR are more limited than expected.

Gender is the most consistent predictor of RRT likelihood changes. This reflects Gustafson's suggestion (1998) that women fundamentally perceive risks differently than men; this may genetic, not only socially constructed.

It is surprising that highly individualised behaviours, i.e. smoking, show no significant MEs on IR RRT. This supports the conjecture that these lifestyle choices are seen in a different context than financial risks. The fact that survey sections on IR&SR play strongly on lifetime earning gambles, it is defendable that no correlation was found. The nature of the questions as being concerned with income also explains the pronounced Income_Bracket MEs.

Lottery_Playing was an attitudinal behaviour effecting IR significantly. Yet, the direction and this factor's magnitude indicated that as the agent played more frequently, RRT decreased. There was a great deal of heterogeneity in Lottery_Playing habits; however, the overall trend supports Rabin's assertion (2001) that an individual has differentiated attitudes between gambles of various magnitudes. Lottery_Playing gives the opportunity to gain a great deal with little upfront cost, whereas gambling with greater amounts of employment income is more significant and represents a permanent *life choice*.

Employment_Status and Number_of_Children are personal issues distinctly significant to IR RRT. The self-employed are more likely to take self-risks, while seeing risks to society differently; differentiating them from 'all around risk-takers.' Additionally, the birth of a child increases RRA for IR while having no great effect on SR, indicating aversion towards putting one's family at risk; however, whether or not one is a main provider in the family structure does not have any significant effect.

There was high predictability of 'Financial_Risk_Taking' for both IR and SR. The survey asked respondents if they tend to take more financial risks than the average person with no other specification. Thus, the strong MEs associated with a change to Financial_Risk_Taking for IR&SR indicate that for these people there is no strong difference between 'gambling' with their own money or society's. This question was

asked before the survey section on IR; thus, individuals may have answered the IR section in a manner reflecting their answer for the Financial_Risk_Taking question.

The MEs associated with change in Country_of_Residence were uniform between IR&SR, suggesting basic social conditioning of attitudes underlying how individuals think within Latin America and Southern Europe compared to the UK. To further tease out the effect Country_of_Residence; it would be advantageous to differentiate between birth country, the region in which one is raised, and current country of residence. This would explain some elements of heterogeneity by specifically giving insight into what defines "culture."

A series of OLS regressions were run on CC_You and CC_World in order to understand the origin of ME differences between the two indicators. (OuputAVI.3) They are both strongly influenced by gender, Political_Views, and Conservation_Group. And the two are strongly correlated, with a Pearson's R correlation value=0.731. Though baffling, the opposite MEs may not be as disheartening as one would imagine since CC_You seems to decrease the chance of RRT for both SR&IR. Zahran (2006) finds the extent to which citizens regard climate-change as threatening their material well-being drives support for costly climate-change policies.

VI.vii) Inequality and Time vs. Risk

This section discusses MEs seen for GI, NI, and time compared to those for IR&SR.

An OPM specification was run with reduced independent variables to increase explanatory power (reduction in the number of explanatory attitudinal variables; OuputAVI.4-8).

Gender and age are the demographic factors that influence RRT for all of: IR, SR, NI, GI, and time. A change to female for the agent uniformly reduces likelihood that the agent is classified by $\eta<0.5$ and increases likelihood for $\eta>7.5$. An increase in age has the same effect in direction as gender, but is minimal in magnitude.

Country_of_Residence has significant MEs for all η dimensions and serves as an example of the influence of social conditioning on how individuals' value differing dimensions of η. This is interesting for time, which has few other statistically significant MEs; a change in Country_of_Residence to Latin America or Southern Europe yields a reduction in RRT. This effect is in complete opposition to the effect observed for both IR&SR for a change in residence to Latin America or Southern Europe. Though surprising, it is not inconceivable given the low correlation between time and IR&SR.

MEs over Country_of_Residence seen for NI&GI follow from societal structure. A change to Africa is associated with a 15.28% increased in change that the agent is classified as $\eta<0.5$ for NI, while a change to Scandinavia yields a 6.97% reduction in this category. Along the GI dimension, the effect is in the same direction for a change to Africa and a change to the USA yields an increase in RRT. There is additional indication that individuals in different societies differentiate not only between risk and inequality, but the inequality level in question.

Political_Attitudes are by far the most significant MEs on both NI&GI. For instance, as the agent moves from neutral to ultra-liberal for NI, there is an 18.59% decrease (from prob=29.25%) that he is classified by $\eta<0.5$. This high magnitude is likely influenced by the *CES*'s political views question structure; it was specifically based on attitudes towards societal inequality. The implication of similar ME of

Political_Attitude for NI&GI is questionable; the back-to-back presentation of the question sets likely yielded high section to section learning effects.

The responses to attitudes towards CC_You and CC_World have no significant effects reported for NI, GI, or time. This fact may be an outgrowth of the manner in which the questions for climate concern were posed in distinct terms of IR or SR rather than specifying inequality or time directly.

Given the low-level correlations for η measures across risk, inequality, and time it is difficult to determine the extent of variation in MEs arising from: OPM specification, original survey question framing, and true variation in attitudes.

CHAPTER.VII

Conclusions/Implications

This dissertation investigated public attitudes towards the elasticity of marginal utility, η, a central and ethically important parameter in the *Stern Review* (2006), and indeed, any study of climate-change economics. Importantly, this dissertation began from the premise that the three different conceptual dimensions of η, namely: risk; inequality; and time should not simply be presumed identical.

Through an on-line stated-preference survey, it was found that median values for η actually differ across the three conceptual dimensions. Lower modal values for individual and social risk were reported compared to those for inequality and time dimensions, which fall into the extreme category ($\eta>7.5$). Surprisingly, such extreme valuation would be expected by Rawls' maximin rule (ChapterII.viii).

The results in this dissertation suggest that the commonly accepted value $\eta=1$ (Stern, 2006) is an inappropriate assumption. This requires reconsideration of the current discounting framework, especially in long timeframes associated with climate-change policy. One starting point is to introduce such survey findings into Kreps-Porteus style preference sets differentiating the three η dimensions while accounting for uncertainty and ambiguity of climate-change projections as well as weighting consumption patterns and risk attitudes that are region-specific.

Timeframes in survey question modules reflected climate-change policies; however, the module wording was not climate-change specific. Current wording was meant to not appeal to feelings over the emotionally-charged issue of climate-change, seeking to avoid answers reflecting "purchase of moral satisfaction" (Kahneman and Knetsch, 1992). This structure assumed a substitutability between climate-change and other long-term policies. Even if viable, as advocated by strong sustainability theory, this method may not provide answers specifically regarding climate-change attitudes. It would be advantageous to run a similar survey with question modules worded specifically towards climate-change and compare results with those of the *CES*.[38]

Heterogeneity sources accounting for attitude differentiation towards risk, inequality, and time were modelled in this work. The common significant motivators were found to be gender and

[38] In the current *CES*, question-order and starting-value randomisation would reduce "social responsibility bias."

Country_of_Residence. Due to the extent of heterogeneity in individuals' explanatory variables, isolated MEs may not explain all observed patterns. OPM structure requires MEs be presented compared to a reference case. Evaluated with regard to an alternative reference, ME presentation differs; thus, there is inherent model subjectivity. A multinomial choice model may have allowed a more flexible ME structure.[39]

Data were collected on respondent preference heterogeneity sources, but tracing development of an individual's risk preferences is important. Incorporating biological and social-conditioning risk perception theories requires establishing more sophisticated qualitative structures than possible with the *CES*. In-person interviews would facilitate understanding individual reasoning and emotion regarding questions asked directly in the climate-change context; specifically looking at the extent of individuals' *bounded rationality* and life-time evolution of preferences would be of interest.

Yet, the fact that respondents were not asked to answer behind a veil of ignorance did facilitate transparency between explanatory and dependent variable responses in the *CES*. But, response anonymity makes post-survey follow-up questioning impossible, though the researchers received a number of feedback emails.

Subsequent research should encourage respondents to think about *global society* working to address major climate-change consequences for which probabilities/outcomes are difficult to quantify, but Bayesian degrees of belief do not suffice (Stern per.comm.) This is especially important in view of the influences established between Country_of_Residence in the OPMs, especially for IR&SR.

There is a wealth of future research possible from the work done in the *CES*, nevertheless, this dissertation established that the classical theoretical view of η is not appropriate given individual stated-attitudes. This should be recognised and corrections should begin to be made. Even minor adjustments to η valuation and differentiation of risk from inequality and time, significantly informs IAMs and corresponds to CBA climate-change policy evaluations. Under sensitivity analysis (i.e. TableII.2), the η ranges established in this dissertation would drastically alter GDP consumption damages from climate-change. Additionally,

[39] "Although the unrestricted MNP model is fully identified in principle, convergence to satisfactory results in applications with more than three choices requires many additional restrictions" Greene(2000).

given the public's high relative aversion to risk, inequality, and time, as revealed in this dissertation, the advocated 405-550 ppm CO_2 stabilisation-level (Stern, 2006) must be reconsidered along with the consumption-path society takes to get there.

"The cause isn't served when parameter values are so chosen that they yield desired answers" (Dasgupta, 2006). This dissertation addressed the problem of valuing η by revealed ethical or market approaches in isolation by directly surveying the public. These findings must be understood on a qualitative level by policymakers and incorporated in the climate-change economics framework.

CHAPTER.VIII

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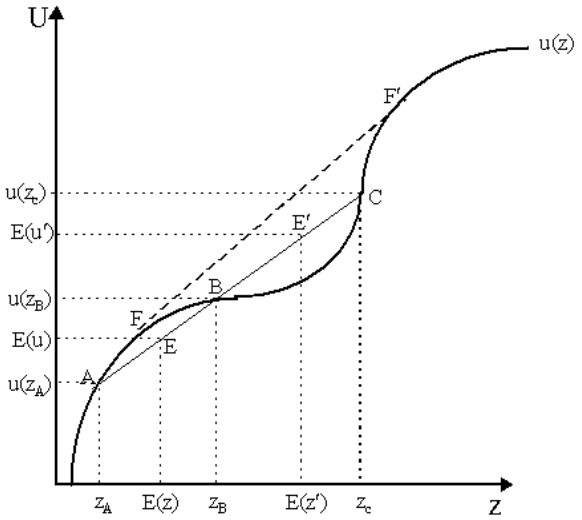
APPENDIX.I

Theoretical Background



FigureAI.1. Friedman-Savage (1948) double inflection utility function. At low income levels (between the origin and Z_B) the agent exhibits risk-aversion; similarly she is risk-averse at very high income levels (above Z_c). But, between inflection points, B&C, the agent is risk-loving.

RESOURCES	DOMINANT SECTOR	GENERALISED MEDIUM	MOTIVATOR
Money	Economy	Transfer of capital	Economic incentives
Power	Politics	Force/authority	Punishment/compliance
Social influence	Social system/Gov't.	Reputation/reward	Trust/prestige
Value commitment	Culture	Persuasion/meaning	Solidarity/cultural utility
Evidence	Sciences	Methodology/Rhetoric	Expected impacts

TableAI.1. Summary chart of social motivators (outside of economics) influencing risk attitudes.

APPENDIX.II

Methodology

TableAII.1: The *Climate Ethics Survey* was distributed through the following on-line lists:

Climate Change Information Mailing List, International.
EARTHNOTES, Brandeis University
Environment & Ethics List, University of Oxford
Fulbright Academy of Science & Technology, July 2007 On-Line Newsletter
Green College students & staff, University of Oxford
Linacre College students & staff, University of Oxford
MSc Environmental Change and Management Alumni List, University of Oxford
National Institute of Standards and Technology, Office of Applied Economics
Parent Heart Watch, USA
Physics Department, University of Oxford
RESECON list (Land & Resource Economics Network)
SPIRE, Norwegian University of Life Sciences
The *Facebook*

FigureAII.1: "Invitation Letter" to take part in the *Climate Ethics Survey*.

You are invited to take the "Climate Ethics" survey. This is an online research survey we are conducting at the University of Oxford. The purpose of the survey is to gather public attitudes toward some ethical questions related to the economic analysis of climate change.

There is currently an academic debate on the way economic analyses of climate change deal with risk, inequality and time. It is our view that this debate should not be monopolized by economists, philosophers and other academics. Therefore, we seek to include the views of the wider public. If the survey proves successful, it will very likely be followed by a larger government-funded study.

Your contribution is valuable. By taking our short pilot survey, you will help inform one of the most important debates related to climate change ethics and economics. You will be given the opportunity to provide your email address so that we can send you the results of the project.
The following link directs you to the survey: http://hakon.red-redemption.com//index.php?sid=25

The survey contains 32 questions, and takes approximately fifteen minutes to complete. It requires no prior knowledge of climate change or economics. All responses will be treated anonymously and will only be used for academic purposes.

We hope you will participate in our survey. Should you have any questions or suggestions as to how we can improve this survey, you may reach us at: jennifer.helgeson@green.ox.ac.uk or hakon.saelen@linacre.ox.ac.uk

Feel free to forward this email to anyone you think may be interested.

Your contribution is greatly appreciated.
Best wishes,
Jennifer Helgeson and Håkon Sælen

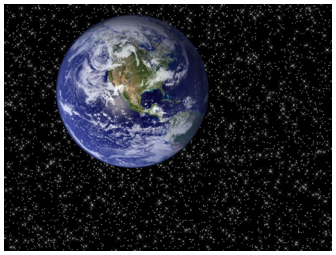
FigureAII.2: "Sponsored story" advertisement placed on the *Facebook*:

The Climate Ethics Survey

You are invited to take this short survey conducted by the University of Oxford.

Have a click through; your views are important!

http://hakon.red-redemption.com//index.php?sid=25



APPENDIX.III

The Climate Ethics Survey

Please note that this survey is available on-line at:

http://hakon.red-redemption.com//index.php?sid=25

This is the general version of the survey.

Please click on your country of residence below to start.

If your country of residence is not listed, please still take the survey.
Simply click on the NEXT button at the bottom of this page to get to a country list

AUSTRALIA

CANADA

MEXICO
(MÉXICO)

UNITED KINGDOM

UNITED STATES OF AMERICA

* **B. Country of Residence:**
This is the general version of the survey.

Please select your country of residence below.
Please choose **only one** of the following:

- ☐ Afghanistan
- ☐ Albania
- ☐ Algeria
- ☐ Andorra
- ☐ Angola
- ☐ Antigua & Barbuda
- ☐ Argentina
- ☐ Armenia
- ☐ Australia
- ☐ Austria
- ☐ Azerbaijan
- ☐ Bahamas
- ☐ Bahrain
- ☐ Bangladesh
- ☐ Barbados
- ☐ Belarus
- ☐ Belgium
- ☐ Belize
- ☐ Benin
- ☐ Bhutan
- ☐ Bolivia
- ☐ Bosnia & Herzegovina
- ☐ Botswana
- ☐ Brazil
- ☐ Brunei
- ☐ Bulgaria
- ☐ Burkina Faso
- ☐ Burundi

- ☐ Cambodia
- ☐ Cameroon
- ☐ Canada
- ☐ Cape Verde
- ☐ Central African Republic
- ☐ Chad
- ☐ Chile
- ☐ China
- ☐ Colombia
- ☐ Comoros
- ☐ Congo (Brazzaville)
- ☐ Congo, Democratic Republic of the
- ☐ Costa Rica
- ☐ Cote d'Ivoire
- ☐ Croatia
- ☐ Cuba
- ☐ Cyprus
- ☐ Czech Republic
- ☐ Denmark
- ☐ Djibouti
- ☐ Dominica
- ☐ Dominican Republic
- ☐ East Timor
- ☐ Ecuador
- ☐ Egypt
- ☐ El Salvador
- ☐ Equatorial Guinea
- ☐ Eritrea
- ☐ Estonia
- ☐ Ethiopia
- ☐ Fiji

- ☐ Finland
- ☐ France
- ☐ Gabon
- ☐ Gambia
- ☐ Georgia
- ☐ Germany
- ☐ Ghana
- ☐ Greece
- ☐ Grenada
- ☐ Guatemala
- ☐ Guinea
- ☐ Guinea-Bissau
- ☐ Guyana
- ☐ Haiti
- ☐ Honduras
- ☐ Hungary
- ☐ Iceland
- ☐ India
- ☐ Indonesia
- ☐ Iran
- ☐ Iraq
- ☐ Ireland
- ☐ Israel
- ☐ Italy
- ☐ Jamaica
- ☐ Japan
- ☐ Jordan
- ☐ Kazakhstan
- ☐ Kenya
- ☐ Kiribati
- ☐ Korea, North

- ☐ Korea, South
- ☐ Kuwait
- ☐ Kyrgyzstan
- ☐ Laos
- ☐ Latvia
- ☐ Lebanon
- ☐ Lesotho
- ☐ Liberia
- ☐ Libya
- ☐ Liechtenstein
- ☐ Lithuania
- ☐ Luxembourg
- ☐ Macedonia
- ☐ Madagascar
- ☐ Malawi
- ☐ Malaysia
- ☐ Maldives
- ☐ Mali
- ☐ Malta
- ☐ Marshall Islands
- ☐ Mauritania
- ☐ Mauritius
- ☐ Mexico
- ☐ Micronesia
- ☐ Moldova
- ☐ Monaco
- ☐ Mongolia
- ☐ Montenegro
- ☐ Morocco
- ☐ Mozambique
- ☐ Myanmar

- ☐ Namibia
- ☐ Nauru
- ☐ Nepal
- ☐ Netherlands
- ☐ New Zealand
- ☐ Nicaragua
- ☐ Norway
- ☐ Oman
- ☐ Pakistan
- ☐ Palau
- ☐ Panama
- ☐ Papua New Guinea
- ☐ Paraguay
- ☐ Peru
- ☐ Philippines
- ☐ Poland
- ☐ Portugal
- ☐ Qatar
- ☐ Romania
- ☐ Russia
- ☐ Rwanda
- ☐ Saint Kitts & Nevis
- ☐ Saint Lucia
- ☐ Saint Vincent & The Grenadines
- ☐ Samoa
- ☐ San Marino
- ☐ Sao Tome & Principe
- ☐ Saudi Arabia
- ☐ Senegal
- ☐ Serbia
- ☐ Seychelles

- ☐ Sierra Leone
- ☐ Singapore
- ☐ Slovakia
- ☐ Slovenia
- ☐ Solomon Islands
- ☐ Somalia
- ☐ South Africa
- ☐ Spain
- ☐ Sri Lanka
- ☐ Sudan
- ☐ Suriname
- ☐ Swaziland
- ☐ Sweden
- ☐ Switzerland
- ☐ Syria
- ☐ Taiwan
- ☐ Tajikistan
- ☐ Tanzania
- ☐ Thailand
- ☐ Togo
- ☐ Tonga
- ☐ Trinidad & Tobago
- ☐ Tunisia
- ☐ Turkey
- ☐ Turkmenistan
- ☐ Tuvalu
- ☐ Uganda
- ☐ Ukraine
- ☐ United Arab Emirates
- ☐ United Kingdom
- ☐ United States of America

- ☐ Uruguay
- ☐ Uzbekistan
- ☐ Vanuatu
- ☐ Vatican City
- ☐ Venezuela
- ☐ Vietnam
- ☐ Western Sahara
- ☐ Yemen
- ☐ Zambia
- ☐ Zimbabwe

****Please note that throughout the survey $ refers to USA dollars.****

As a guide, some approximate exchange rates are listed below:

COUNTRY / REGION	$1 USD =
Brazil	2.0 BRL
China	7.7 CNY
Croatia	5.3 HRK
Czech Republic	20.5 CZK
Denmark	5.5 DKK
Estonia	11.4 EEK
European Union	0.75 EUR
India	42.0 INR
Iraq	1250.0 IQD
Israel	4.3 ILS
Japan	120.0 JPY
Madagascar	9150.0 MGF
New Zealand	1.3 NZD
Norway	6.0 NOK
Serbia	60.0 YUN
South Africa	7.0 ZAR
Sweden	6.8 SEK
Switzerland	1.2 CHF
Russia	25.5 RUB

Thank you for your patience.

Survey_Section_1: Attitudes/Opinions

Q.A.1:
Question 1.

How often do you play the lottery?

Please choose **only one** of the following:

- ☐ Never
- ☐ A few times a year
- ☐ About once a month
- ☐ About every week

Q.A.2:
Question 2.

Do you use a seatbelt when you are a back seat passenger?

Please choose **only one** of the following:

- ☐ Always
- ☐ Most of the time
- ☐ Seldom

Q.A.3:
Question 3.

Do you smoke cigarettes?

Please choose **only one** of the following:

- ☐ Frequently (many times a week)
- ☐ Seldom
- ☐ Used to, but quit
- ☐ Trying to quit
- ☐ Have never smoked

Q.A.4:
Question 4.

What is your opinion of the following statement?

"It is the responsibility of the government to reduce the differences in income between people with high incomes and those with low incomes."

Please choose **only one** of the following:

- ☐ Agree strongly
- ☐ Agree
- ☐ Neither agree nor disagree
- ☐ Disagree
- ☐ Disagree strongly

Q.A.5:
Question 5.

Do you take more financial risks than most of your peers?

An example of financial risk is investing in stocks or assets that have a high likelihood of financial default.

Please choose **only one** of the following:

- ☐ Yes
- ☐ No

Q.A.6:
Question 6.

What is your opinion of the following statement?

The effects of climate change will pose serious risks to YOU and YOUR FAMILY during the remainder of your lifetime.

Serious risks from climate change can include more extreme weather events, rising sea level, and negative impacts on human health, ecosystems and the economy.

Please choose **only one** of the following:

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly Agree

Q.A.7:
Question 7.

What is your opinion of the following statement?

The effects of climate change will pose serious risks to GLOBAL SOCIETY during the remainder of your lifetime.

Serious risks from climate change can include more extreme weather events, rising sea level, and negative impacts on human health, ecosystems and the economy.

Please choose **only one** of the following:

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly Agree

Survey_Section_2: Income Distribution (National)

This section seeks to explore your attitudes toward the distribution of income within a country.

In reality, there is often a trade-off between achieving the highest total national income and creating an equal distribution between the rich and the poor. That is, policies aimed at distributing income from rich to poor often reduce the total ‘size of the pie’.

The following questions require you to make such a trade-off. In each question, you will be asked to choose between two different distributions, labelled A and B. Option B gives a more equal distribution between rich and poor, but the total income is higher in Option A.

When answering these questions, assume that your position in the national income distribution is approximately the same as it is in reality.

Remember, there is no 'correct' answer to these questions, and we ask you to reflect on the choices carefully. If you change your mind along the way, you may of course change your earlier responses.

There are three questions in this section.

* **Q.I.N.1:**
Question 1.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.N.1 ']
* **Q.I.N.2.1:**
Question 2.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option B**' to question 'Q.I.N.1 ']

* **Q.I.N.2.2:**

Question 2.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.N.1 ' *and* if you answered '**Option A**' to question 'Q.I.N.2.1 ']

* **Q.I.N.3.1:**

Question 3.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

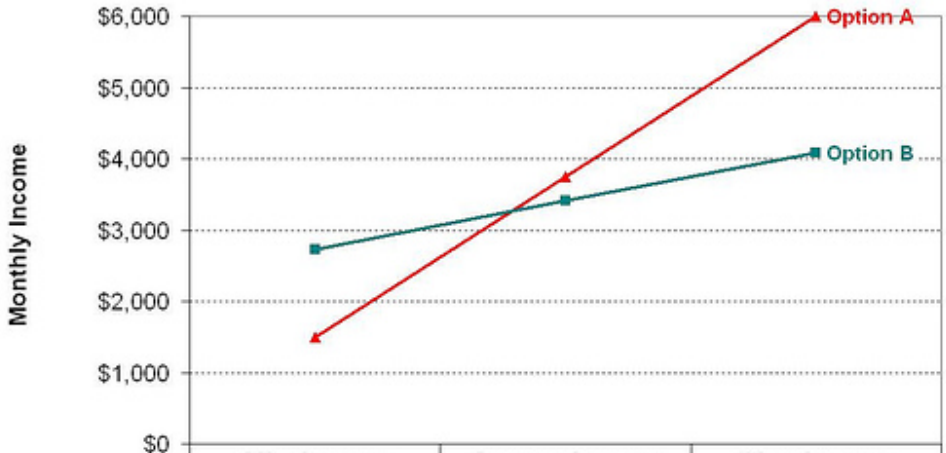
Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.N.1 ' *and* if you answered '**Option B**' to question 'Q.I.N.2.1 ']

* **Q.I.N.3.2:**

Question 3.



	Min. Income	Average Income	Max. Income
Option A	$1,500	$3,750	$6,000
Option B	$2,730	$3,410	$4,090

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option B**' to question 'Q.I.N.1 ' *and* if you answered '**Option A**' to question 'Q.I.N.2.2 ']

* **Q.I.N.3.3:**

Question 3.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option B**' to question 'Q.I.N.1 ' *and* if you answered '**Option B**' to question 'Q.I.N.2.2 ']

* **Q.I.N.3.4:**

Question 3.

Which national income distribution option would you prefer?

Assumptions:

There are no social programs to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the range stated in the question. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population. Within this range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the economy. The prices of goods are the same for both options; i.e. for $100 you can buy the same amount of goods in both options.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

Survey_Section_3: Income Distribution (Global)

Now we are interested in your attitudes towards the distribution between rich and poor on a global level.

How much total global income should be sacrificed to achieve a more equal distribution?

The format of these questions is the same as in the previous section, and the same assumptions apply.

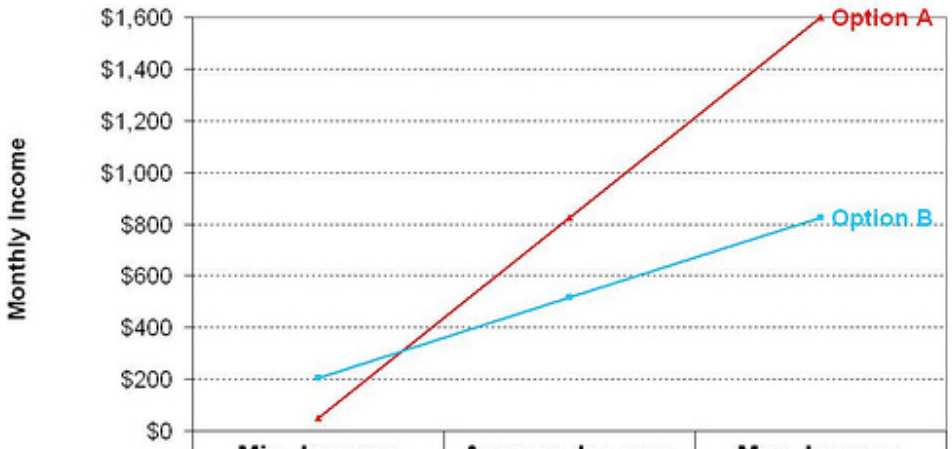
The incomes are adjusted for purchasing power, so that one dollar buys the same amount of goods in every country.

Again, assume that your position in the global income distribution is approximately the same as it is in reality.

Remember, there is no 'correct' answer to these questions, and we ask you to reflect on the choices carefully. If you change your mind along the way, you may of course change your earlier responses.

There are three questions in this section.

* **Q.I.G.1:**
Question 1.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$206	$516	$826

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

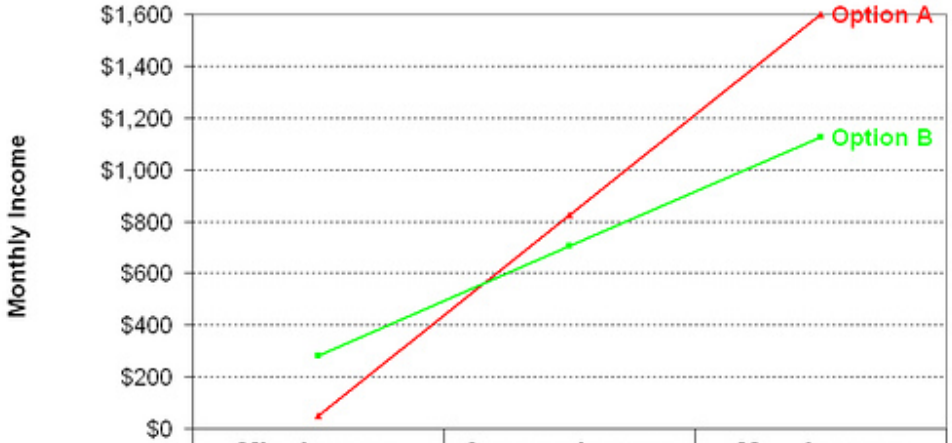
Please choose **only one** of the following:

- ☐ Option A
- ☐ Option B
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.G.1 ']

* **Q.I.G.2.1:**

Question 2.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$282	$705	$1,127

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

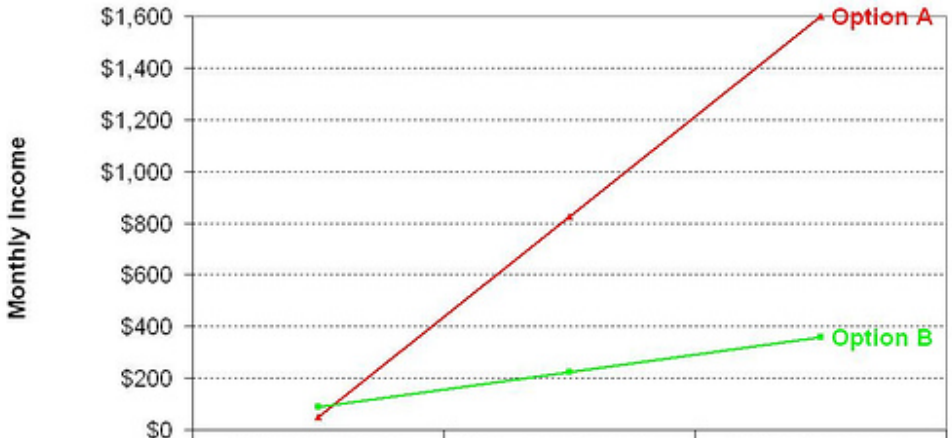
Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option B**' to question 'Q.I.G.1 ']

* **Q.I.G.2.2:**

Question 2.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$89	$223	$357

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

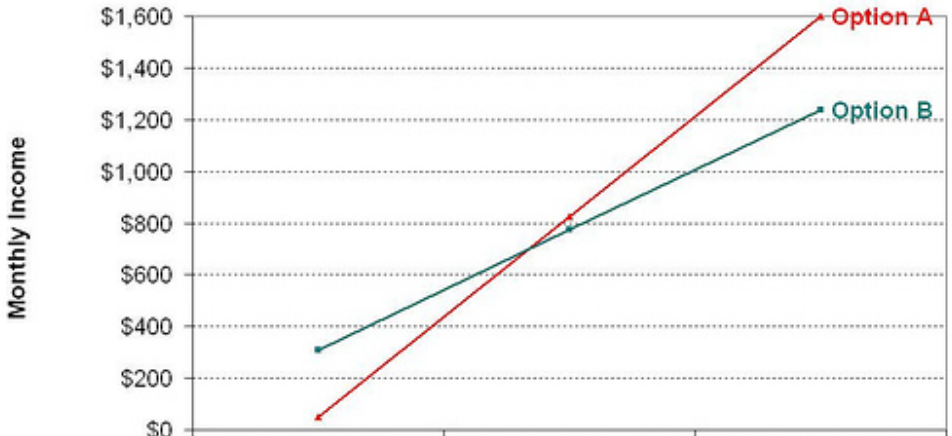
Please choose **only one** of the following:

- ☐ Option A
- ☐ Option B
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.G.1 ' *and* if you answered '**Option A**' to question 'Q.I.G.2.1 ']

* **Q.I.G.3.1:**

Question 3.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$310	$774	$1,238

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

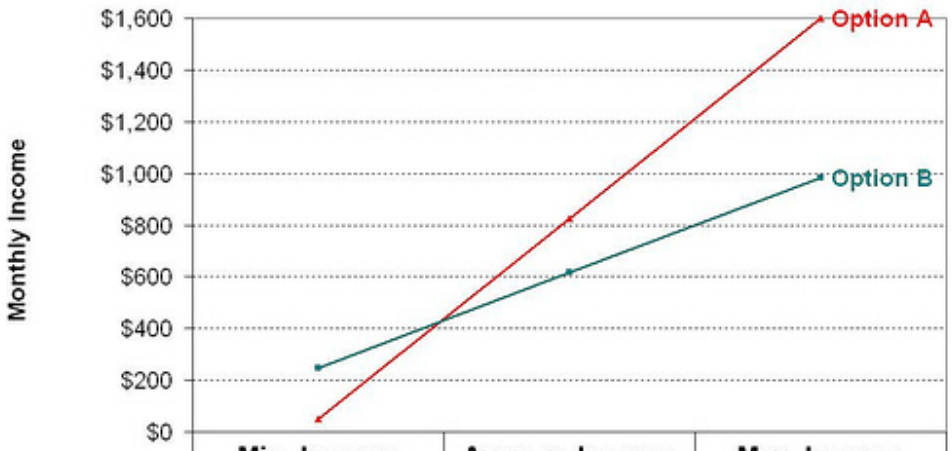
Please choose **only one** of the following:

- ☐ Option A
- ☐ Option B
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.G.1 ' *and* if you answered '**Option B**' to question 'Q.I.G.2.1 ']

* **Q.I.G.3.2:**

Question 3.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$246	$616	$985

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

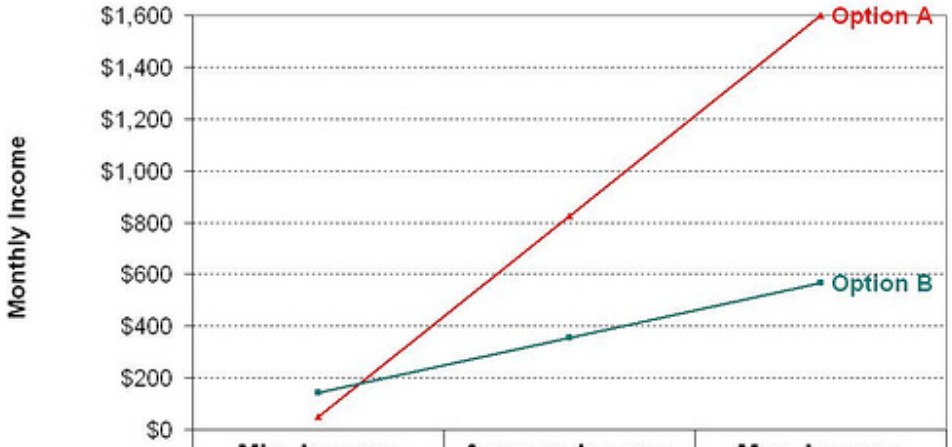
Please choose **only one** of the following:

- ☐ Option A
- ☐ Option B
- ☐ I choose not to answer

[Only answer this question if you answered '**Option A**' to question 'Q.I.G.2.2 ' *and* if you answered '**Option B**' to question 'Q.I.G.1 ']

* **Q.I.G.3.3:**

Question 3.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$141	$354	$566

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

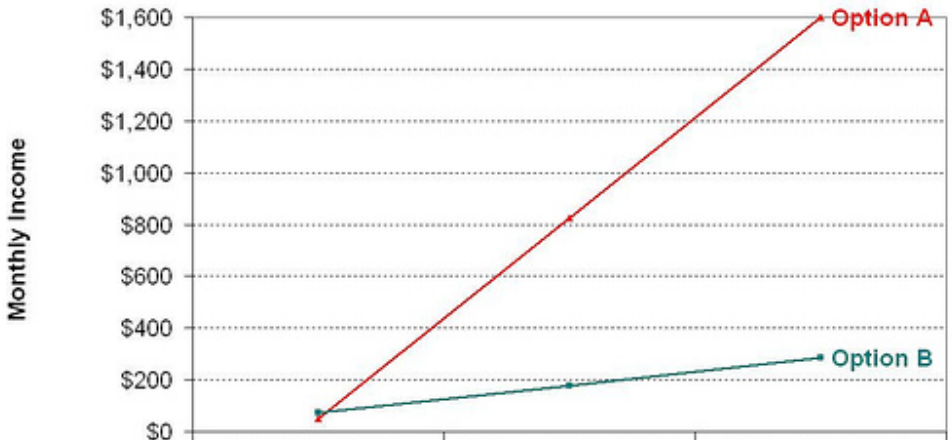
Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

[Only answer this question if you answered '**Option B**' to question 'Q.I.G.2.2 ' *and* if you answered '**Option B**' to question 'Q.I.G.1 ']

* **Q.I.G.3.4:**

Question 3.



	Min. Income	Average Income	Max. Income
Option A	$50	$825	$1,600
Option B	$72	$179	$286

Which global income distribution option would you prefer?

Assumptions:

There are no social programs or international aid to help the poorest people, and everyone has to pay for their own education, health care, etc.

The richest 10% and the poorest 10% of people lie outside the stated range. Assume that these people are unaffected by your choice of distribution; your decision affects only the middle 80% of the population.
Within the stated range, people are distributed evenly, so that there is the same number of people in the upper and the lower half of the distribution.

The options differ only in terms of their income distribution, and this distribution does not affect the future growth rate of the global economy.

Please choose **only one** of the following:

- ☐ **Option A**
- ☐ **Option B**
- ☐ I choose not to answer

Survey_Section_4: Personal_Risk

This section explores how willing you are to take risks with your own personal income.

Would you prefer a job that guarantees a stable level of income, or would you be willing to take the risk of a job that may end up paying more, but may also end up paying less?

In each question you are asked to compare two different job options. These jobs differ only in terms of the income they provide.

Job A is the same in every question. With this job, you are guaranteed a given level of income.
Job B is different in each of the three questions.
Job B entails a 50-50 chance of an income double that Job A, but there is also a 50-50 chance that income will be lower than in Job A, by a certain proportion.

In each question we ask you which job you would take.

Please try to think about how you would choose in real life.

There are three questions in this section.

---

* **Q.R.I.1:**
Question 1.

Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **33% lower** than in Job A.

Which job do you prefer?
Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job B' to question 'Q.R.I.1 ']
* **Q.R.I.2.1:**
Question 2.
Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **50% lower** than in Job A.

Which job do you prefer?
Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job A' to question 'Q.R.I.1 ']
* **Q.R.I.2.2:**
Question 2.
Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **15% lower** than in Job A.

Which job do you prefer?
Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job B' to question 'Q.R.I.1 ' *and* if you answered 'Job B' to question 'Q.R.I.2.1 ']

* **Q.R.I.3.1:**

Question 3.

Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **66% lower** than in Job A.

Which job do you prefer?

Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job B' to question 'Q.R.I.1 ' *and* if you answered 'Job A' to question 'Q.R.I.2.1 ']

* **Q.R.I.3.2:**

Question 3.

Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **40% lower** than in Job A.

Which job do you prefer?

Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job A' to question 'Q.R.I.1 ' *and* if you answered 'Job B' to question 'Q.R.I.2.2 ']

* **Q.R.I.3.3:**

Question 3.

Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **25% lower** than in Job A.

Which job do you prefer?

Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

[Only answer this question if you answered 'Job A' to question 'Q.R.I.1 ' *and* if you answered 'Job A' to question 'Q.R.I.2.2 ']

* **Q.R.I.3.4:**

Question 3.

Assume you are choosing a new job. Your options are either Job A or Job B, described below.

OPTION	Income Description
Job A	Income level is guaranteed.
Job B	50-50 chance that income is double that of Job A. 50-50 chance that income will be **10% lower** than in Job A.

Which job do you prefer?

Please choose **only one** of the following:

- ☐ Job A
- ☐ Job B
- ☐ I choose not to answer

Survey_Section_5: Societal_Risk

Q.R.S.1:

Question 1.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 33%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'Yes' to question 'Q.R.S.1 ']
Q.R.S.2.1:

Question 2.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 50%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'No' to question 'Q.R.S.1 ']

Q.R.S.2.2:

Question 2.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 15%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'Yes' to question 'Q.R.S.1 ' *and* if you answered 'Yes' to question 'Q.R.S.2.1 ']
Q.R.S.3.1:

Question 3.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 66%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'Yes' to question 'Q.R.S.1 ' *and* if you answered 'No' to question 'Q.R.S.2.1 ']
Q.R.S.3.2:

Question 3.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 40%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'No' to question 'Q.R.S.1 ' *and* if you answered 'Yes' to question 'Q.R.S.2.2 ']
Q.R.S.3.3:

Question 3.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 25%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'No' to question 'Q.R.S.1 ' *and* if you answered 'No' to question 'Q.R.S.2.2 ']
Q.R.S.3.4:

Question 3.

Suppose that the government can guarantee that the current average national income is sustained forever.

But it has the opportunity to make a policy that gives a 50-50 chance of doubling the national average income.
On the other hand, the proposed policy also has a 50-50 chance of cutting the current average national income by 10%.

Would you be willing to have the government adopt such a policy?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

Survey_Section_6: Time

Some of the policies adopted by governments affect how the standard of living will change in the future. Many of these policies can be thought of in a way similar to your own decisions on how much to spend and how much to save.

Some policies can increase future income quite a lot by sacrificing only a small amount of income today. Other policies require large cuts now for modest gains in the future.

How should the living standard in one period be weighed against the living standards in another period?

The following questions ask you to choose between government saving and spending plans that cover the period Now-2107 and 2107-2207.

Assume that there is no inflation.

Remember, there is no 'correct' answer to these questions, and we ask you to reflect on the choices carefully. If you change your mind along the way, you may of course change your earlier responses.

There are four questions in this section.

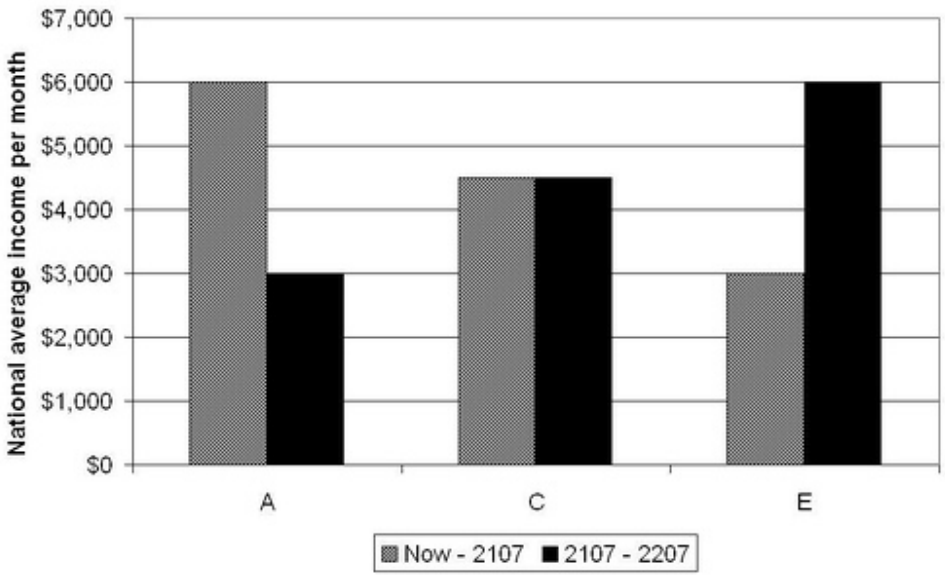
* **Q.T.1:**

Question 1.

This question contains several possible ways in which standards of living could change over the next two hundred years.

Government policies to save and invest today will ensure that future generations have a higher standard of living next century, as in choice E.
Or government could encourage more borrowing and spending this century, spending less next, as in choice A.
Or government policies could aim for a constant standard of living, as in choice C.

In this first question, saving $1 in the first period means that income in the second period increases by $1.



PLAN	A	C	E
NOW-2107	$6000	$4500	$3000
2107-2207	$3000	$4500	$6000

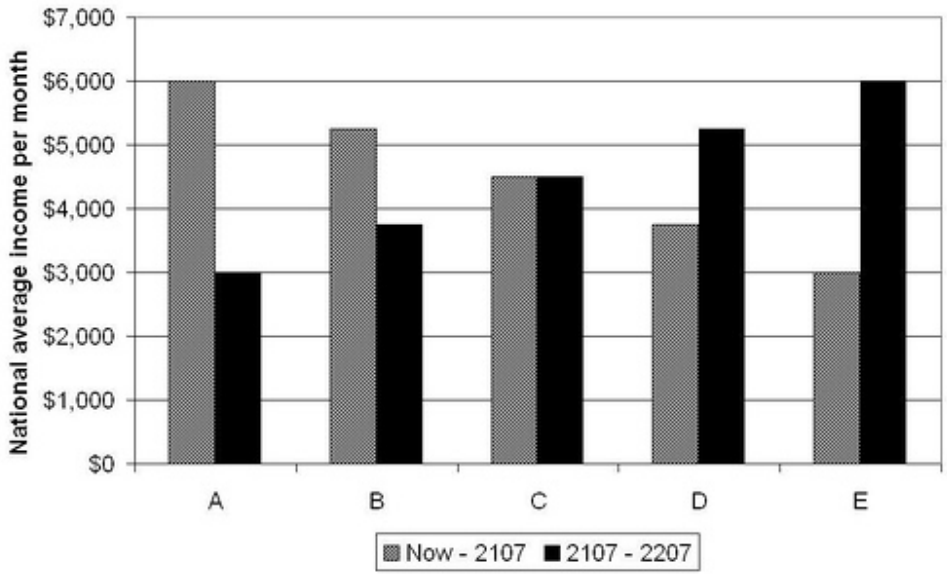
Which plan do you prefer?
Please choose **only one** of the following:

- ☐ A
- ☐ C
- ☐ E
- ☐ I choose not to answer

* **Q.T.2:**

Question 2.

Here are the same plans as before, but with two additional choices.



PLAN	A	B	C	D	E
NOW-2107	$6000	$5250	$4500	$3750	$3000
2107-2207	$3000	$3750	$4500	$5250	$6000

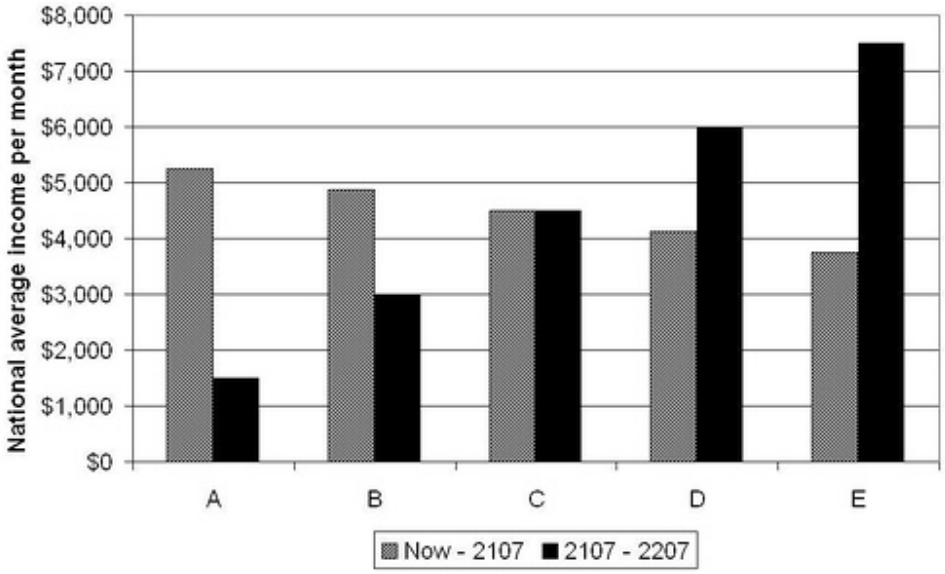
Which plan do you prefer?
Please choose **only one** of the following:

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ I choose not to answer

* **Q.T.3:**

Question 3.

Here is another set of plans.
Saving $1 in the first period means that income in the second period increases by $4.



PLAN	A	B	C	D	E
NOW-2107	$5250	$4875	$4500	$4125	$3750
2107-2207	$1500	$3000	$4500	$6000	$7500

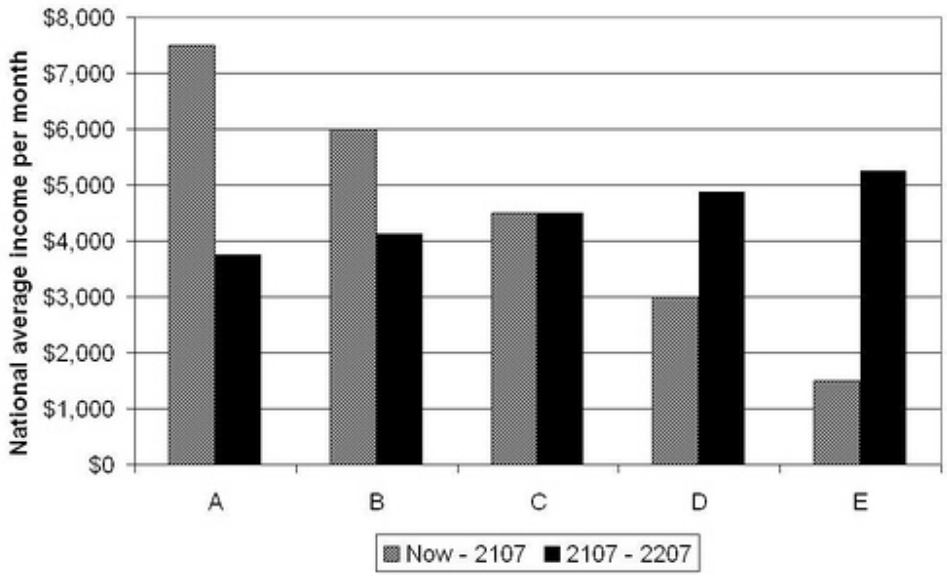
Which plan do you prefer?
Please choose **only one** of the following:

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ I choose not to answer

* **Q.T.4:**

Question 4.

Finally, in this last set of plans, saving $1 in the first period means that income in the second period increases by $0.25



PLAN	A	B	C	D	E
NOW-2107	$7500	$6000	$4500	$3000	$1500
2107-2207	£3750	$4125	$4500	$4875	$5250

Which plan do you prefer?
Please choose **only one** of the following:

- ☐ A
- ☐ B
- ☐ C
- ☐ D
- ☐ E
- ☐ I choose not to answer

Survey_Section_7: Demographics

In the following section we ask you to answer some basic demographic information.
As before, the responses are confidential and anonymous.
We seek this information solely for the purpose of analysis of the data obtained in the first sections of this survey.

There are nine questions in this section.

Q.D.1:
Question 1.

Please specify your gender:
Please choose **only one** of the following:

- ☐ Female
- ☐ Male

Q.D.2:
Question 2.

Please specify the year of your birth

Use a 4-digit format i.e. 1901; only years of the form: 19XX will be accepted.

Please write your answer here:

Q.D.3:
Question 3.

How many individuals make up your household?
(yourself included; please do not count pets)
Please write your answer here:

Q.D.4:
Question 4.

What is your average total household income annually?
(Please include the income of all earners in your household before taxes.)

Remember that these responses are anonymous and confidential.

Please choose **only one** of the following:

- ☐ <$15000
- ☐ $15000-$29999
- ☐ $30000-$44999
- ☐ $45000-$59999
- ☐ $60000-$74999
- ☐ $75000-$89999
- ☐ $90000-$99999
- ☐ $100000-$119999
- ☐ $120000-$129999
- ☐ $130000-$139999
- ☐ $140000-$159999
- ☐ $160000-$174999
- ☐ $175000-$189999
- ☐ $190000-$199999
- ☐ $200000-$219999
- ☐ $220000-$299999
- ☐ $300000-$349999
- ☐ $350000-$449999
- ☐ >$450000

Q.D.5:
Question 5.

Which option best describes your highest level of education completed?
Please choose **only one** of the following:

- ☐ Some high school or less
- ☐ High School Graduate
- ☐ College/University Undergraduate Degree
- ☐ Post-Graduate Degree (Master or PhD)
- ☐ Medical (doctor) Degree
- ☐ Law Degree

Q.D.6:
Question 6.

What is your current employment status?
Please choose **only one** of the following:

- ☐ Full-time private sector
- ☐ Full-time public sector
- ☐ Self-employed
- ☐ Leave (paid)
- ☐ Leave (other)
- ☐ Retired
- ☐ Taking care of the house (homemaker)
- ☐ Student
- ☐ Unemployed

Q.D.7:
Question 7.

How many children do you have?
Please choose **only one** of the following:

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ >5

Q.D.8:
Question 8.

Are you the primary financial provider within your household?

The UNCERTAIN option indicates that you share the position of *PRIMARY* financial provider

Please choose **only one** of the following:

- ☐ NO
- ☐ YES
- ☐ Uncertain

Q.D.9:
Question 9.

Are you a member of an environmental organization or conservation group?
Please choose **only one** of the following:

- ☐ Yes
- ☐ No

THANK YOU

* **Q1T:**
Before you finish, would you like to hear more about this survey and its inspiration?

Please choose **only one** of the following:

- ☐ Yes
- ☐ No

[Only answer this question if you answered 'Yes' to question 'Q1T '] **Q2T:**

The inspiration for this survey is the academic debate following from the publication of the "Stern Review on the Economics of Climate Change."

One of the most contentious issues has been how the economic framework deals with risk, time and inequality.

It is our view that this debate should not be monopolised by economists, philosophers and other academics, and we therefore seek to include the views of the wider public.

We thank you for sharing your attitudes towards these questions by taking this survey.

We are working in collaboration with some of the contributors to the Stern Review, and Nicholas Stern has himself expressed interest in the study. If it is successful, it may be followed up by a larger survey funded by Defra and the HM Treasury.

Thank you for helping us take the economic analysis climate change one small step forward!

Your contribution is greatly appreciated.

Best regards,
Jennifer Helgeson and Håkon Sælen

Q3T: Thank you for completing the survey.
Your responses will remain anonymous and confidential.

If you would like to have more information about the results and the progress of this project, please provide your e-mail address below.

If you would like to get in touch with us, please send an e-mail to:
jennifer.helgeson@green.ox.ac.uk

Again, THANK YOU for your time!

Please write your answer here:

APPENDIX.IV

Data

Table AIV.1: Break-down of responses between each survey version. Tracking IP addresses ensured responses were unique.

	Australia	Canada	Mexico	UK	USA	World	Total
Number of Respondents	190	1157	56	1036	435	771	3645

Table AIV.2: Break-down of responses ignored based on irrational answers to Section_6:Time.

	Type I.	Type II.	Total: TypeI+TypeII	Number of Total Survey Responses	Percent Discarded
Australia	10	21	31	190	16.32%
Canada	56	153	209	1157	18.06%
Mexico	4	10	14	56	25.00%
UK	38	102	140	1036	13.51%
USA	9	43	52	453	11.48%
World	24	87	111	771	14.40%
Total	141	416	557	3654	15.24%

Table AIV.3: Median and modal values for ordinal assignments to qualitative variables. For frequency break-down of all categories, see **TableAV.????**

Independent Variable	Corresponding Survey Question	Total Responses	Median	Mode
Lottery	Q.A.1	3130	1	1
			(Never)	(Never)
Seatbelt	Q.A.2	3097	1	1
			(Always)	(Always)
Smoke	Q.A.3	3103	5	5
			(Have never smoked)	(Have never smoked)
Politics	Q.A.4	3092	2	1
			(Neither agree nor disagree)	(Agree)
Financial_Risk_Taker	Q.A.5	2947	N	N
CC_You	Q.A.6	3128	3	3
			(Agree)	(Agree)
CC_World	Q.A.7	3081	4	4
			(Strongly Agree)	(Strongly Agree)
Gender	Q.D.1	3112	M	M
Household_Members	Q.D.3	3112	3	2
Income_Band	Q.D.4	2989	4	2
			(£40000-£49999)	(£20000-£29999)
Education_Level	Q.D.5	3094	2	2
			(College/University Degree)	(College/University Degree)
Employment_Status	Q.D.6	3113	1	0
			(Full-time public sector)	(Full-time private sector)
Children_Number	Q.D.7	3092	0	0
Primary_Provider	Q.D.8	3016	0	0
			(No)	(No)
Conservation_Group	Q.D.9	3041	N	N

APPENDIX.V

Data Analysis/Discussion:

Risk vs. Inequality and Time

		National Inequality(NI)		Global Inequality(GI)	
Category Number	**Range**	**Frequency**	**Cumulative Frequency**	**Frequency**	**Cumulative Frequency**
0	$\eta < 0.5$	23.0	23.0	14.3	14.3
1	$0.5 < \eta < 1.0$	3.4	26.4	5.4	19.7
2	$1.0 < \eta < 1.5$	3.0	29.4	6.0	25.8
3	$1.5 < \eta < 2.0$	4.4	33.8	7.1	32.9
4	$2.0 < \eta < 3.0$	8.7	42.5	18.3	51.2
5	$3.0 < \eta < 5.0$	9.6	52.1	12.3	63.5
6	$5.0 < \eta < 7.5$	11.6	63.6	5.8	69.3
7	$7.5 < \eta$	36.4	100.0	30.7	100.0

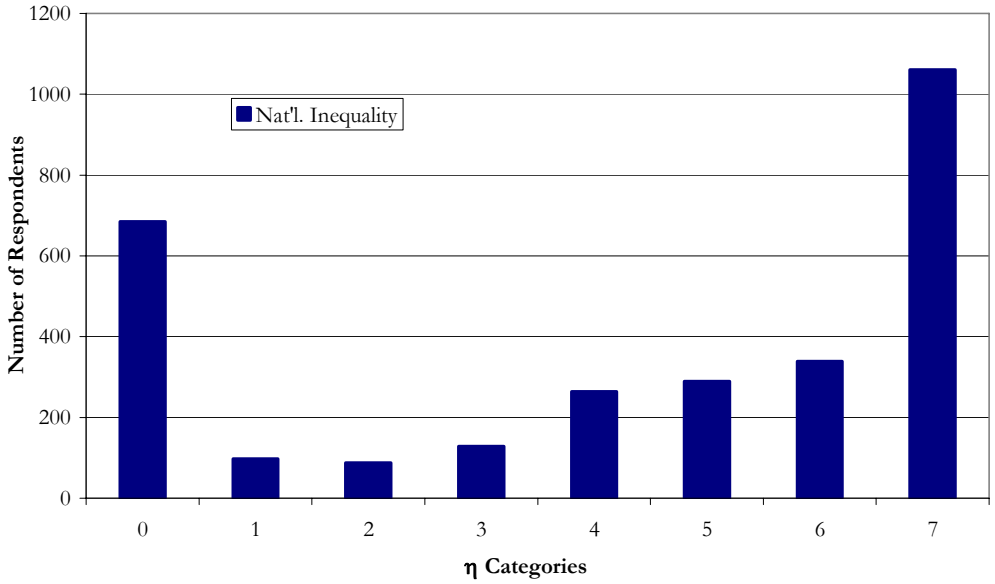
TableAV.1:Frequencies and cumulative frequencies for η categories, National and Global Inequality.

		Social Risk(SR)		Individual Risk(IR)	
Category Number	**Range**	**Frequency**	**Cumulative Frequency**	**Frequency**	**Cumulative Frequency**
0	$\eta < 0.5$	5.9	5.9	2.9	2.9
1	$0.5 < \eta < 1.0$	9.0	14.9	4.1	7.0
2	$1.0 < \eta < 1.5$	6.8	21.7	4.1	11.2
3	$1.5 < \eta < 2.0$	14.3	36.0	17.0	28.2
4	$2.0 < \eta < 3.0$	7.5	43.5	4.9	33.1
5	$3.0 < \eta < 5.0$	25.2	68.7	32.3	65.4
6	$5.0 < \eta < 7.5$	12.2	80.9	14.1	79.5
7	$7.5 < \eta$	19.1	100.0	20.5	100.0

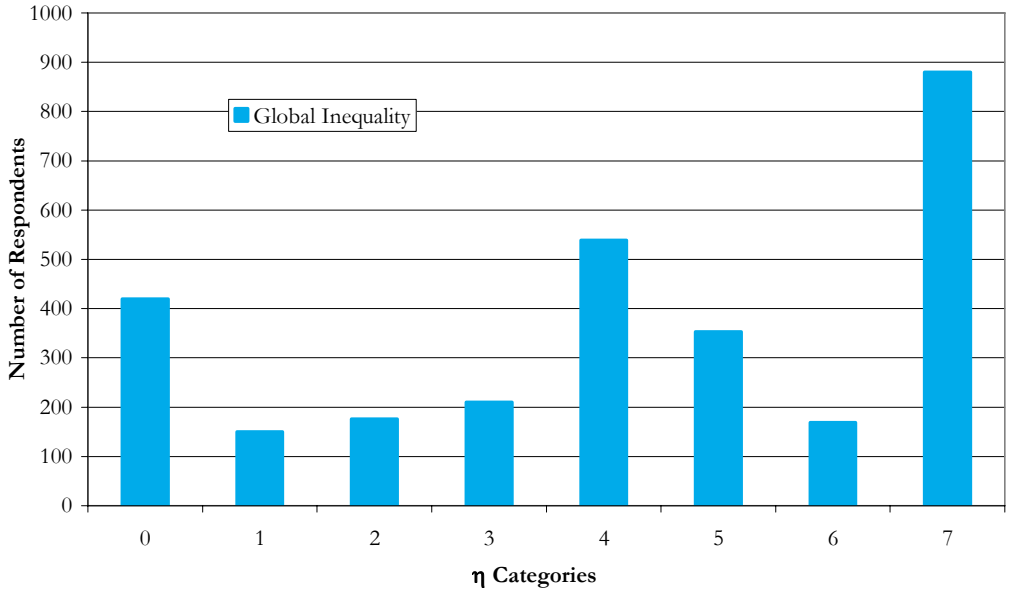
TableAV.2:Frequencies and cumulative frequencies for η categories, Social and Individual Risk.

		Distribution Pairings					
		SR&IR	**SR&NI**	**SR&GI**	**IR&NI**	**IR&GI**	**NI&GI**
Most Extreme Differences	**Absolute**	0.106	0.201	0.181	0.172	0.115	0.114
	Positive	0.106	0.201	0.181	0.172	0.115	0.087
	Negative	0.0	-0.158	-0.101	-0.171	-0.084	-0.114
Kolmogorov-Smirnov Z		4.04	7.495	6.723	6.576	4.385	4.274
Asymp. Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000

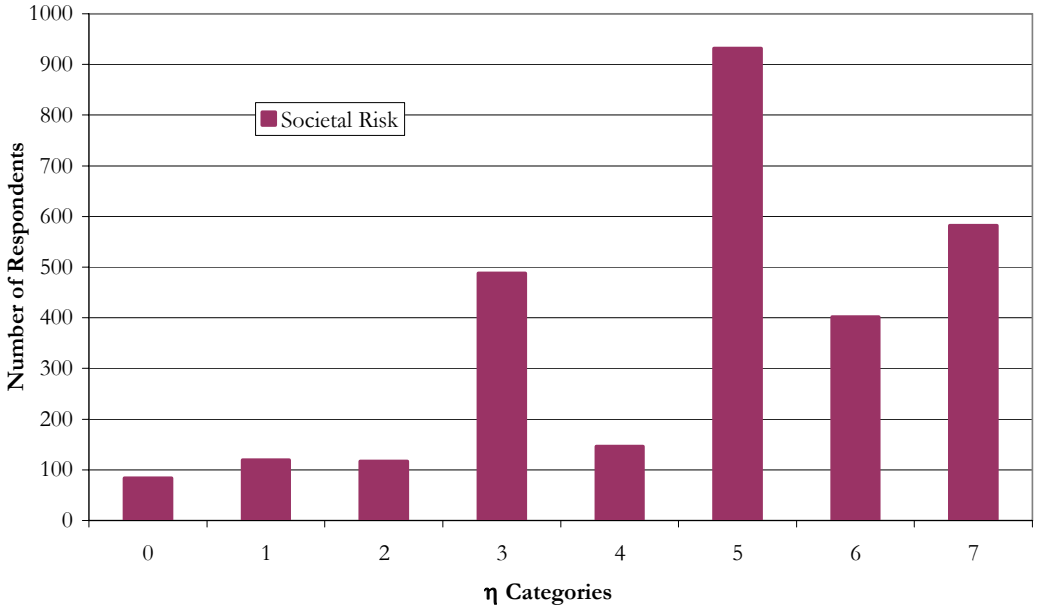
Table AV.3: Kolmogorov-Smirnov Tests of distribution equality for IR, SR, NI, and GI.



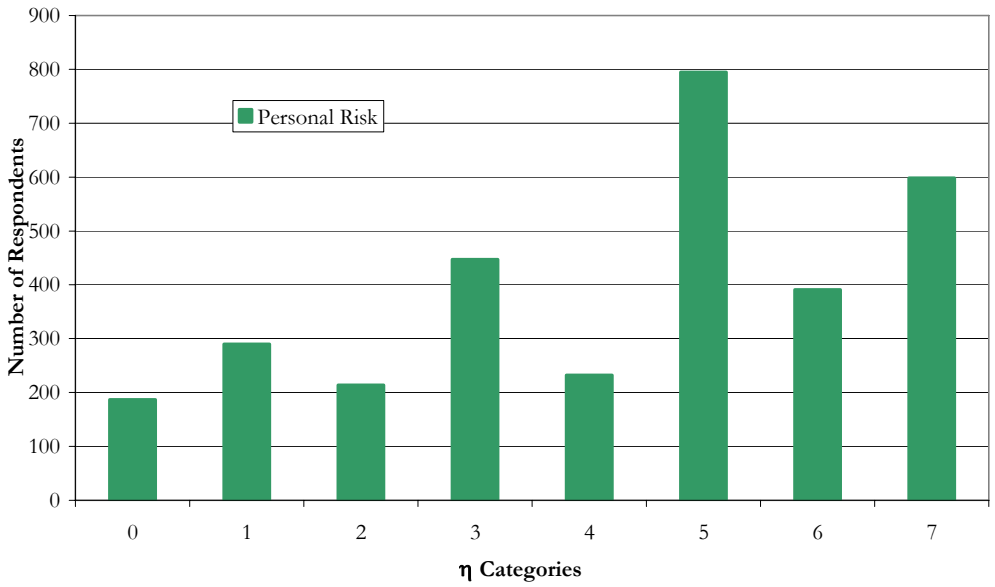
FigureAV.1: η category frequencies: National Inequality.



FigureAV.2: η category frequencies: Global Inequality.



FigureAV.3: η category frequencies: Social Risk.



FigureAV.4: η category frequencies: Individual (Personal) Risk.

OutputAV.1: Stata assisted lognormal distribution fits for: Individual Risk, Social Risk, National Inequality, and Global Inequality.

```
/*LOGNORMAL FIT FOR INDIVIDUAL RISK*/

. nl (InRiskFreq = normal( (ln(RRTu)-{mu})/{sigma})-normal((ln(RRTl)-
      {mu})/{sigma}) ), initial(mu 0 sigma 1)

(obs = 8)

Iteration 0:  residual SS =  .0368559
Iteration 1:  residual SS =  .0140175
Iteration 2:  residual SS =  .0135687
Iteration 3:  residual SS =  .0135553
Iteration 4:  residual SS =  .0135547
Iteration 5:  residual SS =  .0135546
Iteration 6:  residual SS =  .0135546
Iteration 7:  residual SS =  .0135546
Iteration 8:  residual SS =  .0135546

      Source |       SS       df       MS
-------------+------------------------------           Number of obs =       8
       Model |  .143479178     2  .071739589           R-squared     =  0.9137
    Residual |  .013554612     6  .002259102           Adj R-squared =  0.8849
-------------+------------------------------           Root MSE      =  .04753
       Total |   .15703379     8  .019629224           Res. dev.     = -28.34074

------------------------------------------------------------------------------
  InRiskFreq |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         /mu |  -1.171251   .1428948    -8.20   0.000    -1.520902   -.8216001
      /sigma |   1.008868   .1307808     7.71   0.000     .6888592    1.328877
------------------------------------------------------------------------------


/*LOGNORMAL FIT FOR SOCIAL RISK*/

. nl (SocRiskFreq = normal( (ln(RRTu)-{mu})/{sigma})-normal((ln(RRTl)-
      {mu})/{sigma}) ), initial(mu 0 sigma 1)
(obs = 8)

Iteration 0:  residual SS =  .0897183
Iteration 1:  residual SS =  .0376961
Iteration 2:  residual SS =  .0291295
Iteration 3:  residual SS =  .0289981
Iteration 4:  residual SS =  .0289943
Iteration 5:  residual SS =  .0289941
Iteration 6:  residual SS =  .0289941
Iteration 7:  residual SS =  .0289941
Iteration 8:  residual SS =  .0289941

      Source |       SS       df       MS
-------------+------------------------------           Number of obs =       8
       Model |  .172883459     2   .08644173           R-squared     =  0.8564
    Residual |  .028994081     6  .004832347           Adj R-squared =  0.8085
-------------+------------------------------           Root MSE      =  .0695151
       Total |  .201877541     8  .025234693           Res. dev.     = -22.25782

------------------------------------------------------------------------------
 SocRiskFreq |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         /mu |  -1.394685   .1623434    -8.59   0.000    -1.791925   -.9974446
      /sigma |    .773952   .1434521     5.40   0.002     .4229372    1.124967
------------------------------------------------------------------------------
```

/*LOGNORMAL FIT NATIONAL INEQUALITY*/

```
. nl (NInequalFreq = normal( (ln(RRTu)-{mu})/{sigma})-normal((ln(RRTl)-
      {mu})/{sigma}) ), initial(mu 0 sigma 1)
(obs = 8)

Iteration 0:  residual SS =  .0309694
Iteration 1:  residual SS =  .0079015
Iteration 2:  residual SS =  .0077113
Iteration 3:  residual SS =  .0077102
Iteration 4:  residual SS =  .0077102
Iteration 5:  residual SS =  .0077102
Iteration 6:  residual SS =  .0077102

      Source |       SS       df       MS
-------------+------------------------------           Number of obs =         8
       Model |  .211495865     2  .105747932           R-squared     =    0.9648
    Residual |   .00771019     6  .001285032           Adj R-squared =    0.9531
-------------+------------------------------           Root MSE      =  .0358473
       Total |  .219206055     8  .027400757           Res. dev.     = -32.85422

------------------------------------------------------------------------------
NInequalFreq |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         /mu |  -1.198879   .1853836    -6.47   0.001    -1.652496   -.7452617
      /sigma |   2.479734   .3041307     8.15   0.000     1.735553    3.223915
------------------------------------------------------------------------------
```

/*LOGNORMAL FIT FOR GLOBAL INEQUALITY*/

```
. nl (GInequalFreq = normal( (ln(RRTu)-{mu})/{sigma})-normal((ln(RRTl)-
      {mu})/{sigma}) ), initial(mu 0 sigma 1)
(obs = 8)

Iteration 0:  residual SS =  .0234248
Iteration 1:  residual SS =  .0126473
Iteration 2:  residual SS =  .0123359
Iteration 3:  residual SS =   .012331
Iteration 4:  residual SS =  .0123309
Iteration 5:  residual SS =  .0123309
Iteration 6:  residual SS =  .0123309
Iteration 7:  residual SS =  .0123309

      Source |       SS       df       MS
-------------+------------------------------           Number of obs =         8
       Model |  .165917354     2  .082958677           R-squared     =    0.9308
    Residual |  .012330862     6  .002055144           Adj R-squared =    0.9078
-------------+------------------------------           Root MSE      =  .0453337
       Total |  .178248215     8  .022281027           Res. dev.     = -29.09772

------------------------------------------------------------------------------
GInequalFreq |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         /mu |  -1.187969   .1759422    -6.75   0.001    -1.618484   -.7574539
      /sigma |   1.641667   .2135459     7.69   0.000     1.119139    2.164195
------------------------------------------------------------------------------
```

Estimated Value	Frequency	Percent	Cumulative Percent
0.000	1584	64.4	64.4
0.020	120	4.9	69.2
0.021	247	10.0	79.3
0.114	145	5.9	85.2
0.142	57	2.3	87.5
0.207	36	1.5	88.9
0.262	66	2.7	91.6
0.265	31	1.3	92.9
0.268	85	3.5	96.3
0.388	26	1.1	97.4
0.508	39	1.6	99.0
0.509	3	0.1	99.1
0.755	22	0.9	100.0
Total	2461	100.0	

Table AV.4: Frequency of lower boundary estimates for intertemporal elasticity of substitution (time).

Estimated Value	Frequency	Percent	Cumulative Percent
0.114	557	22.7	22.7
0.142	590	24.0	46.6
0.207	117	4.8	51.4
0.262	301	12.2	63.6
0.265	417	17.0	80.6
0.268	93	3.8	84.4
0.388	57	2.3	86.7
0.508	32	1.3	88.0
0.509	146	5.9	93.9
0.755	33	1.3	95.3
5.000	116	4.7	100.0
Total	2459	100.0	

Table AV.5: Frequency of upper boundary estimates for intertemporal elasticity of substitution (time).

Estimated Value	Frequency	Percent	Cumulative Percent
0.00	2	.1	.1
0.06	557	22.6	22.7
0.07	590	24.0	46.7
0.10	1	.0	46.7
0.11	116	4.7	51.4
0.13	1	.0	51.5
0.13	417	16.9	68.4
0.13	15	.6	69.0
0.14	247	10.0	79.1
0.25	1	.0	79.1
0.26	174	7.1	86.2
0.31	145	5.9	92.1
0.39	46	1.9	93.9
0.51	333	1.4	95.3
2.51	4	.2	95.4
2.60	36	1.5	96.9
2.69	26	1.1	98.0
2.75	25	1.0	99.0
2.75	3	.1	99.1
2.88	22	.9	100.0
Total	2461	100.0	

Table AV.6: Frequency of midpoint estimates for intertemporal elasticity of substitution (time).

		Frequency(%)				
Category	**Range**	**Individual Risk**	**Social Risk**	**National Inequality**	**Global Inequality**	**Time**
0	$\eta < 0.5$	2.9	5.9	23.0	14.3	4.72
1	$0.5 < \eta < 1.0$	4.1	14.9	3.4	5.4	0.0
2	$1.0 < \eta < 1.5$	4.1	21.7	3.0	6.0	0.0
3	$1.5 < \eta < 2.0$	17	36.0	4.4	7.1	1.34
4	$2.0 < \eta < 3.0$	4.9	43.5	8.7	18.3	1.87
5	$3.0 < \eta < 5.0$	32.3	68.7	9.6	12.3	13.01
6	$5.0 < \eta < 7.5$	14.1	80.9	11.6	5.8	10.65
7	$7.5 < \eta$	20.5	100.0	36.4	30.7	68.4

Table AV.7: Comparative frequencies of relative tolerance for: individual risk, social risk, national inequality, global inequality, and time.

OutputAV.2: Example Monte Carlo simulations: estimated means for η categories assuming the fit lognormal Social Risk equation.

```
/*18000 random numbers generated from a standard normal distribution.*/

. set obs 18000
. ge e=invnorm(uniform())


/*generation of non-standard normal values based on estimated equation for Social
      Risk.*/

. ge lnr=-1.394685+.7739512*e


/*transformation to RRT means.*/

. ge r=exp(lnr)


/*summarisation for calculated means in each of the 8 η categories given by
      specified RRT boundaries.*/

. su r if lnr<0.13

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |     17555    .3029656    .2150296   .0119414   1.137921


. su r if lnr>.13 & lnr<.2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        86    1.176924    .0246952   1.139868   1.221367


. su r if lnr>.2 & lnr<.33

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |       131    1.300211    .0479361   1.221653   1.389742


. su r if lnr>.333 & lnr<.5

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |       102    1.516573    .0712302   1.397739    1.64706


. su r if lnr>.5 & lnr<.666

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        62    1.779328    .0829161   1.649197   1.942808


. su r if lnr>.66 & lnr<1

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        48    2.231698    .2116393   1.942808   2.713858
```

```
. su r if lnr>1 & lnr<2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        15    3.545301     1.07846   2.790581   6.239581


. su r if lnr>2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |         0
```

/*second generation of non-standard normal values based on estimated equation for Social Risk.*/

```
. replace e=invnorm(uniform())
(18000 real changes made)

. replace lnr=-1.394685+.7739512*e
(18000 real changes made)

. replace r=exp(lnr)
(18000 real changes made)

. su r if lnr<0.13

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |     17529    .3063331    .2164907   .0126377   1.137987


. su r if lnr>.13 & lnr<.2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |       106     1.17801    .0231405   1.140205   1.220255


. su r if lnr>.2 & lnr<.33

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |       132    1.305968    .0523515   1.223211   1.390044


. su r if lnr>.333 & lnr<.5

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |       113    1.505177    .0753098   1.396246   1.646038


. su r if lnr>.5 & lnr<.666

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        58    1.755131    .0894365   1.649072   1.933431


. su r if lnr>.66 & lnr<1

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        45    2.248211    .2207428   1.966112    2.71138

.
```

```
. su r if lnr>1 & lnr<2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |        13     3.29056    .5153546   2.769367   4.384084


. su r if lnr>2

    Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
           r |         1    7.753158           .   7.753158   7.753158
```

OutputAV.3: Stata assisted lognormal distribution fit for Elasticity of Intertemporal Substitution (Time).

```
nl (TimeFreq  = normal( (ln(RRTu)-{mu})/{sigma})-normal((ln(RRTl)-{mu})/{sigma}) ),
      initial(mu 1 sigma 2)
(obs = 8)

Iteration 0:  residual SS =  .2632182
Iteration 1:  residual SS =  .0174507
Iteration 2:  residual SS =  .0131111
Iteration 3:  residual SS =  .0071713
Iteration 4:  residual SS =  .0049756
Iteration 5:  residual SS =  .0040743
Iteration 6:  residual SS =  .0040024
Iteration 7:  residual SS =  .0040022
Iteration 8:  residual SS =  .0040022
Iteration 9:  residual SS =  .0040022

      Source |       SS       df       MS              Number of obs =       8
-------------+------------------------------           R-squared     =  0.9920
       Model |  .494941815     2  .247470908           Adj R-squared =  0.9893
    Residual |  .004002204     6  .000667034           Root MSE      =  .025827
-------------+------------------------------           Res. dev.     = -38.0998
       Total |   .49894402     8  .062368002

------------------------------------------------------------------------------
    TimeFreq |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         /mu |  -2.508349   .1114784   -22.50   0.000    -2.781126   -2.235571
      /sigma |   1.012711   .2045078     4.95   0.003      .512298    1.513123
```

Table AV.8: Median and modal η categories across Age quartiles.

	Median η Category				
Age Category	**Social Risk**	**Individual Risk**	**Global Inequality**	**National Inequality**	**Time**
<23 years	5	5	4	4	7
23-27 years	5	5	4	5	7
27-34 years	5	5	4	5	7
>34 years	5	5	5	6	7
	Modal η Category				
Age Category	**Social Risk**	**Individual Risk**	**Global Inequality**	**National Inequality**	**Time**
<23 years	5	5	7	7	7
23-27 years	5	5	7	7	7
27-34 years	5	5	7	7	7
>34 years	5	7	7	7	7

Table AV.9: Median η categories across regions (controlling for no other variables).

	Median η Category				
Region	**Social Risk**	**Individual Risk**	**Global Inequality**	**National Inequality**	**Time**
Africa	5	5	4	3.5	7
Pacific	5	5	4	5	7
Western Europe	5	3	4.5	6	7
Southern Europe	5	4	5	6	7
USA	4.5	4	4.5	6.5	7
UK	5	4	4	5	7
Canada	5	5	5	5	7
Eastern Asia	5	5	4	5	7
Scandinavia	5	5	4.5	5	7
Middle East	5	5	5	6	7
Eastern Europe	4.5	5	4	5	7

Table AV.10: Median η categories across attitudes towards climate change and political outlook (controlling for no other variables).

.

	Median η Category				
Attitude	**Social Risk**	**Individual Risk**	**Global Inequality**	**National Inequality**	**Time**
Concerned about Global climate change (CC_World=3|4)	5	5	5	6	7
Not Concerned about Global climate change (CC_World=0|1)	5	5	4	2	7
Concerned about Local climate change (CC_You=3|4)	5	5	5	6	7
Not Concerned about Local climate change (CC_You=0|1)	5	4.5	4	4	7
Liberal (Politics=0|1)	5	5	5	6	7
Conservative (Politics=3|4)	5	4	4	2	7

APPENDIX.VI

Data Analysis/Discussion:

Attitudes Towards Risk

TableAVI.1: Demographic indicators: Frequency breakdown; dummy variable specification. Dummy Variable reference categories are specified as ***reference*** under each variable set. Variable names as given are those used in Stata to run OMP models.

.

Demographic Indicator/Dummy Variable	Response Code	Meaning	Percent Frequency
Gender			
female	F	Female	47.62%
reference	***M***	***Male***	***52.38%***
genderMiss		Failure to respond	
Income_Band			
Income0	0	<£10000	8.70%
Income1	1	£10000-£19999	11.27%
Income2	2	£20000-£29999	13.88%
Income3	3	£30000-£39999	12.95%
reference	***4***	***£40000-£49999***	***10.97%***
Income5	5	£50000-£59999	8.77%
Income6	6	£60000-£69999	6.22%
Income7	7	£70000-£79999	7.06%
Income8	8	£80000-£139999	12.01%
Income9	9	>£140000	8.16%
IncomeMiss		Failure to respond	
Education_Level			
ed0	0	Some High School or Less	5.53%
ed1	1	High School Graduate	19.52%
reference	***2***	***College/University Undergraduate Degree***	***44.09%***
ed3	3	Post-Graduate Degrees (Master or PhD)	27.86%
ed4	4	Medical (doctor) Degree	0.87%
ed5	5	Law Degree	2.13%
edMiss		Failure to respond	

TableAVI.1 continued on next page.

TableAVI.1 cont.

Demographic Indicator/Dummy Variable	Response Code	Meaning	Percent Frequency
Employment_Status			
reference	***0***	***Full-time private sector***	***30.81%***
employ1	1	Full-time public sector	23.10%
employ2	2	Retired	1.35%
employ3	3	Student	30.07%
employ4	4	Leave(Other)	0.61%
employ5	5	Leave(Paid)	0.61%
employ6	6	Taking care of the house(Homemaker)	2.18%
employ7	7	Self-Employed	8.10%
employ9	9	Unemployed	3.18%
employMiss		Failure to respond	
*note that there was no employ8 purposefully.			
Number_of_Children			
reference	***0***	***0 Children***	***78.27%***
Kid1	1	1 Child	7.50%
Kid2	2	2 Children	9.77%
Kid3	3	3 Children	3.07%
Kid4	4	4 Children	0.94%
Kid5	5	5 Children	0.23%
Kid6	6	6 or more children	0.23%
KidMiss		Failure to respond	
Primary_Provider			
reference	***0***	***No***	***50.53%***
ProvideDum	1	Yes	38.26%
ProvideUn	2	Uncertain (Shared Responsibility)	11.21%
ProvideMiss		Failure to respond	

Please note that Household_Members and Age were also demographic indicators, but were not assigned ordinal values, and subsequently were not given dummy variable specifications. Yet, to ensure that no response profile was overlooked based on a single missing piece of information, the "placeholder" variables: ageMiss and householdMiss were established.

TableAVI.2: Attitudinal indicators: Frequency breakdown; dummy variable specification. Dummy Variable reference categories are specified as ***reference*** under each variable set. Variable names as given are those used in Stata to run OMP models.

.

Attitudinal Indicator/Dummy Variable	Response Code	Meaning	Percent Frequency
Smoke			
smoke1	1	Frequently (many times a week)	12.25%
smoke2	2	Seldom	11.60%
smoke3	3	Used to, but quit	16.95%
smoke4	4	Trying to quit	4.87%
reference	***5***	***Have never smoked***	***54.33%***
smokeMiss		Failure to respond	
Lottery			
reference	***1***	***Never***	***57.64%***
lot2	2	A few times a year	30.22%
lot3	3	About once a month	6.58%
lot4	4	About every week	5.56%
lotMiss		Failure to respond	
Seatbelt			
reference	***1***	***Always***	***63.97%***
seat2	2	Most of the time	20.37%
seat3	3	Seldom	15.66%
seatMiss		Failure to respond	
Politics			
pol0	0	Strongly agree	14.29%
pol1	1	Agree	33.38%
reference	***2***	***Neither Aggree nor Disagree***	***22.22%***
pol3	3	Disagree	20.86%
pol4	4	Strongly Disagree	9.25%
polMiss		Failure to respond	
Financial_Risk_Taker			
reference	***N***	***Does NOT take many financial risks***	***78.11%***
fin	Y	Does take many financial risks	21.89%
finMiss		Failure to respond	

TableAVI.2 continued on next page.

TableAVI.2 cont.

Attitudinal Indicator/Dummy Variable	Response Code	Meaning	Percent Frequency
CC_You			
CCYou0	0	Strongly Disagree	5.34%
CCYou1	1	Disagree	12.76%
reference	***2***	***Neither Agree nor Disagree***	***12.34%***
CCYou3	3	Agree	38.17%
CCYou4	4	Strongly Agree	31.39%
CCYouMiss			
CC_World			
CCWorld0	0	Strongly Disagree	3.64%
CCWorld1	1	Disagree	5.94%
reference	***2***	***Neither Agree nor Disagree***	***6.39%***
CCWorld3	3	Agree	34.01%
CCWorld4	4	Strongly Agree	50.02%
CCWorldMiss			
Conservation_Group			
reference	***N***	***Does NOT belong to an environmental or conservation group***	***71.29%***
conserve	Y	Does belong to an environmental or conservation group	28.71%
conserveMiss			

TableAVI.3: Country dummy variable assignments; the reference category for Country_of_Residence was the UK.

.

Africa
Canada
East Asia
Eastern Europe
Latin America
Middle East
Pacific
Scandinavia
Southern Europe
USA
Western Europe

		NI	GI	IR	SR	Time
NI	Correlation_Coefficient		**0.491040**	**0.182897**	**0.159594**	**0.122264**
	Sig.(2-tailed)		0.000001	0.000001	0.000001	0.000001
GI	Correlation_Coefficient	**0.510061**		**0.140653**	**0.146968**	**0.116115**
	Sig.(2-tailed)	0.0000		0.0000	0.0000	0.0000
IR	Correlation_Coefficient	**0.182897**	**0.140653**		**0.435798**	**0.138593**
	Sig.(2-tailed)	0.0000	0.0000		0.0000	0.0000
SR	Correlation_Coefficient	**0.159594**	**0.146968**	**0.435798**		**0.095813**
	Sig. (2-tailed)	0.0000	0.0000	0.0000		0.0000
Time	Correlation_Coefficient	**0.124851**	**0.116115**	**0.138593**	**0.095813**	
	Sig.(2-tailed)	0.0000	0.0000	0.0000	0.0000	

TableAVI.4: Kendall's-Tau B correlations applying weights based on the educational attainment of the UK population. (Office of National Statistics, 2004). These correlations are minimally weaker than those found without weighting (TableV.10, reproduced below as TableAVI.5)

		NI	GI	IR	SR	Time
NI	Correlation_Coefficient		**0.510061**	**0.196625**	**0.128621**	**0.124851**
	Sig.(2-tailed)		0.000001	0.000001	0.000001	0.000001
GI	Correlation_Coefficient	**0.510061**		**0.173005**	**0.132955**	**0.124564**
	Sig.(2-tailed)	0.0000		0.0000	0.0000	0.0000
IR	Correlation_Coefficient	**0.196625**	**0.173005**		**0.439682**	**0.138720**
	Sig.(2-tailed)	0.0000	0.0000		0.0000	0.0000
SR	Correlation_Coefficient	**0.128621**	**0.132955**	**0.439682**		**0.092495**
	Sig. (2-tailed)	0.0000	0.0000	0.0000		0.0000
Time	Correlation_Coefficient	**0.124851**	**0.124564**	**0.138720**	**0.092495**	
	Sig.(2-tailed)	0.0000	0.0000	0.0000	0.0000	

TableAVI.5: Kendall's-Tau B correlations without applying weights. Reproduction of TableV.10.

OutputAVI.1: Stata assisted OPM fit for: Individual Risk and associated marginal effects assuming the representative agent with reference categories defined in TablesAVI.1-3. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*OPM specification for Individual Risk*/

```
. oprobit IndRisk  Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia
> Scan MidEast EastEur lot2 lot3 lot4 lotMiss seat2 seat3 seatMiss smoke1 smoke
> 2 smoke3 smoke4 smokeMiss pol0 pol1 pol3 pol4 polMiss fin finMiss CCYou0 CCYo
> u1 CCYou3 CCYou4 CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss fe
> male genderMiss age ageMiss householdMiss Household Income0 Income1 Income2 I
> ncome3 Income5 Income6 Income7 Income8 Income9 IncomeMiss ed0 ed1 ed3 ed4 ed5
>  edMiss employ1 employ2 employ3 employ4 employ5 employ6 employ7 employ9 emplo
> yMiss Kid1 Kid2 Kid3 Kid4 Kid5 Kid6 KidMiss ProvideDum ProvideUn ProvideMiss
> conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
note: householdMiss dropped because of collinearity
Iteration 0:   log likelihood = -5832.6888
Iteration 1:   log likelihood =  -5585.367
Iteration 2:   log likelihood = -5585.1564
Iteration 3:   log likelihood = -5585.1564

Ordered probit regression                       Number of obs   =       2974
                                                LR chi2(80)     =     495.06
                                                Prob > chi2     =     0.0000
Log likelihood = -5585.1564                     Pseudo R2       =     0.0424

------------------------------------------------------------------------------
     IndRisk |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |  -.1578895   .1191371    -1.33   0.185    -.3913941     .075615
     Pacific |  -.0946251   .0861832    -1.10   0.272    -.2635411    .0742908
     LatinAm |  -.3271406   .1218823    -2.68   0.007    -.5660256   -.0882556
     WestEur |  -.1831624   .1037902    -1.76   0.078    -.3865874    .0202627
    SouthEur |   -.454398   .1805527    -2.52   0.012    -.8082747   -.1005212
         USA |  -.0473998   .0664347    -0.71   0.476    -.1776094    .0828098
      Canada |   .0787087   .0522491     1.51   0.132    -.0236977    .1811151
    EastAsia |  -.0749104   .1842423    -0.41   0.684    -.4360186    .2861978
        Scan |   .0149464   .0971597     0.15   0.878     -.175483    .2053758
     MidEast |   .0505887   .1982591     0.26   0.799    -.3379919    .4391693
     EastEur |  -.1625732   .3550137    -0.46   0.647    -.8583873    .5332408
        lot2 |   .0586015   .0456923     1.28   0.200    -.0309539    .1481568
        lot3 |   .1627951   .0843372     1.93   0.054    -.0025027    .3280929
        lot4 |   .2226119   .0901667     2.47   0.014     .0458885    .3993354
     lotMiss |  -.2886886   .3702353    -0.78   0.436    -1.014336    .4369592
       seat2 |  -.0327542   .0509263    -0.64   0.520    -.1325678    .0670595
       seat3 |  -.0835772   .0615082    -1.36   0.174    -.2041311    .0369766
    seatMiss |  -.0065797   .1780097    -0.04   0.971    -.3554722    .3423128
      smoke1 |   .0714927   .0943675     0.76   0.449    -.1134643    .2564497
      smoke2 |   .0522445   .0562905     0.93   0.353    -.0580829     .162572
      smoke3 |     -.0725   .0631771    -1.15   0.251    -.1963249    .0513249
      smoke4 |   .0197598   .0649232     0.30   0.761    -.1074874     .147007
   smokeMiss |    .039862   .1930254     0.21   0.836    -.3384608    .4181848
        pol0 |   .1891285   .0678311     2.79   0.005      .056182     .322075
        pol1 |   .1095324   .0535738     2.04   0.041     .0045297    .2145352
        pol3 |  -.0877394   .0591125    -1.48   0.138    -.2035977    .0281189
        pol4 |  -.4583896   .0804928    -5.69   0.000    -.6161527   -.3006266
     polMiss |   .3559575   .1884142     1.89   0.059    -.0133276    .7252426
         fin |  -.4244831   .0498338    -8.52   0.000    -.5221555   -.3268107
     finMiss |  -.0855132   .0851355    -1.00   0.315    -.2523757    .0813494
      CCYou0 |   .0315826   .1459694     0.22   0.829    -.2545122    .3176775
```

CCYou1	.0587555	.0830744	0.71	0.479	-.1040674	.2215784
CCYou3	.1598706	.0674252	2.37	0.018	.0277196	.2920217
CCYou4	.2722332	.0773764	3.52	0.000	.1205782	.4238881
CCYouMiss	.3838842	.3525215	1.09	0.276	-.3070452	1.074814
CCWorld0	-.0843958	.1750177	-0.48	0.630	-.4274243	.2586327
CCWorld1	-.1261654	.1148419	-1.10	0.272	-.3512514	.0989206
CCWorld3	-.081043	.0815193	-0.99	0.320	-.240818	.078732
CCWorld4	-.2075849	.0871906	-2.38	0.017	-.3784753	-.0366945
female	.2561129	.0418942	6.11	0.000	.1740019	.338224
genderMiss	.1316655	.2759085	0.48	0.633	-.4091053	.6724363
age	-.0015141	.0031741	-0.48	0.633	-.0077352	.0047069
Household	-.0195169	.0176668	-1.10	0.269	-.0541433	.0151094
Income0	.3030096	.0956027	3.17	0.002	.1156318	.4903874
Income1	.2916338	.0858679	3.40	0.001	.1233358	.4599318
Income2	.1607907	.0802709	2.00	0.045	.0034626	.3181189
Income3	.0954039	.0810389	1.18	0.239	-.0634293	.2542371
Income5	.0142035	.0890398	0.16	0.873	-.1603113	.1887183
Income6	.0777091	.0972616	0.80	0.424	-.1129201	.2683384
Income7	-.0043378	.09478	-0.05	0.963	-.1901031	.1814276
Income8	-.0873738	.0827364	-1.06	0.291	-.2495343	.0747866
Income9	-.0884817	.0928049	-0.95	0.340	-.270376	.0934126
IncomeMiss	.2062629	.1161509	1.78	0.076	-.0213888	.4339146
ed0	.2197948	.0948516	2.32	0.020	.0338891	.4057005
ed1	.0351571	.0545896	0.64	0.520	-.0718365	.1421507
ed3	-.0251336	.0522295	-0.48	0.630	-.1275016	.0772344
ed4	.2150598	.2082445	1.03	0.302	-.1930918	.6232114
ed5	-.1598584	.1355004	-1.18	0.238	-.4254344	.1057176
edMiss	-.021429	.1973924	-0.11	0.914	-.408311	.3654529
employ1	.1179169	.0551798	2.14	0.033	.0097665	.2260673
employ2	.4544344	.1955847	2.32	0.020	.0710955	.8377733
employ3	-.1571754	.0599243	-2.62	0.009	-.2746249	-.0397258
employ4	.089654	.2785894	0.32	0.748	-.4563712	.6356792
employ5	-.2858278	.2529171	-1.13	0.258	-.7815362	.2098807
employ6	.24117	.1533883	1.57	0.116	-.0594656	.5418055
employ7	-.2076892	.0791798	-2.62	0.009	-.3628786	-.0524997
employ9	.0125909	.1189547	0.11	0.916	-.220556	.2457377
employMiss	-.1297434	.2637815	-0.49	0.623	-.6467455	.3872587
Kid1	.2595016	.0819887	3.17	0.002	.0988066	.4201966
Kid2	.0944226	.0889805	1.06	0.289	-.0799759	.2688212
Kid3	.3513034	.1328268	2.64	0.008	.0909676	.6116391
Kid4	.4164773	.2312542	1.80	0.072	-.0367725	.8697271
Kid5	.8317433	.4663339	1.78	0.074	-.0822544	1.745741
Kid6	-.128228	.6667209	-0.19	0.847	-1.434977	1.178521
KidMiss	-.0316167	.2054469	-0.15	0.878	-.4342852	.3710519
ProvideDum	-.1041796	.0569797	-1.83	0.067	-.2158578	.0074985
ProvideUn	-.1067737	.0697656	-1.53	0.126	-.2435117	.0299643
ProvideMiss	-.0734058	.1144783	-0.64	0.521	-.2977792	.1509675
conserve	-.0343427	.0475298	-0.72	0.470	-.1274994	.058814
conserveMiss	-.1213324	.1292706	-0.94	0.348	-.3746981	.1320333
/cut1	-1.702342	.1695654			-2.034684	-1.37
/cut2	-1.127334	.1671991			-1.455038	-.7996295
/cut3	-.8418685	.1666113			-1.168421	-.5153163
/cut4	-.3771684	.166183			-.7028812	-.0514557
/cut5	-.1601872	.166097			-.4857314	.1653569
/cut6	.5542129	.1661641			.2285374	.8798885
/cut7	.9775221	.1667713			.6506563	1.304388

/*Predicted Marginal Effects for Individual Risk for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(IndRisk==0) (predict, p outcome(0))
         =  .05481683
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   .0198411      .01697    1.17   0.242  -.013429  .053111         0
 Pacific*|   .0113173      .01102    1.03   0.304  -.010283  .032918         0
 LatinAm*|   .0467452      .02291    2.04   0.041   .001845  .091645         0
 WestEur*|   .0234715      .01548    1.52   0.129   -.00687  .053813         0
SouthEur*|   .0711958      .03922    1.82   0.069  -.005676  .148068         0
     USA*|   .0054614      .00788    0.69   0.488  -.009988  .020911         0
  Canada*|   -.008197      .00567   -1.45   0.148  -.019313  .002919         0
EastAsia*|   .0088213      .02293    0.38   0.700  -.036118  .053761         0
    Scan*|  -.0016386      .01056   -0.16   0.877  -.022331  .019054         0
 MidEast*|  -.0053894      .02033   -0.27   0.791  -.045244  .034465         0
 EastEur*|    .020504       .0506    0.41   0.685  -.078673  .119681         0
    lot2*|  -.0062028      .00498   -1.25   0.213  -.015966   .00356         0
    lot3*|   -.015836      .00821   -1.93   0.054  -.031921  .000249         0
    lot4*|  -.0206238      .00872   -2.36   0.018  -.037718 -.003529         0
 lotMiss*|   .0400861      .06306    0.64   0.525  -.083501  .163673         0
   seat2*|   .0037303      .00592    0.63   0.528  -.007863  .015324         0
   seat3*|   .0099094      .00781    1.27   0.204  -.005389  .025208         0
seatMiss*|   .0007339      .01995    0.04   0.971  -.038363  .039831         0
  smoke1*|   -.007489      .00954   -0.78   0.433  -.026195  .011217         0
  smoke2*|  -.0055584      .00594   -0.94   0.349  -.017194  .006077         0
  smoke3*|   .0085212      .00792    1.08   0.282  -.007009  .024051         0
  smoke4*|  -.0021579      .00702   -0.31   0.759   -.01592  .011604         0
smokeM~s*|  -.0042835      .02014   -0.21   0.832  -.043748  .035181         0
    pol0*|   -.018007      .00734   -2.45   0.014  -.032401 -.003613         0
    pol1*|   -.011126      .00602   -1.85   0.065  -.022924  .000672         0
    pol3*|   .0104371      .00724    1.44   0.150  -.003762  .024636         0
    pol4*|    .072024      .01839    3.92   0.000   .035978   .10807         0
 polMiss*|  -.0295724      .01346   -2.20   0.028  -.055949 -.003196         0
     fin*|   .0651088      .01455    4.48   0.000     .0366  .093618         0
 finMiss*|   .0101544       .0109    0.93   0.352  -.011209  .031518         0
  CCYou0*|  -.0034164       .0155   -0.22   0.826  -.033802  .026969         0
  CCYou1*|  -.0062184      .00877   -0.71   0.479  -.023417   .01098         0
  CCYou3*|  -.0155886       .0073   -2.13   0.033    -.0299 -.001277         0
  CCYou4*|  -.0242187      .00826   -2.93   0.003  -.040408 -.008029         0
CCYouM~s*|  -.0311736      .02158   -1.44   0.148   -.07346  .011113         0
CCWorld0*|   .0100129      .02194    0.46   0.648  -.032997  .053023         0
CCWorld1*|   .0154675      .01494    1.04   0.300  -.013806  .044741         0
CCWorld3*|   .0095897      .00958    1.00   0.317  -.009185  .028364         0
CCWorld4*|   .0271055       .0121    2.24   0.025   .003388  .050823         0
  female*|  -.0230868       .0064   -3.61   0.000  -.035634  -.01054         0
gender~s*|  -.0131362      .02488   -0.53   0.597  -.061898  .035625         0
     age |    .000168      .00036    0.47   0.638  -.000532  .000868     29.67
Househ~d |   .0021654        .002    1.08   0.278  -.001749   .00608      2.95
 Income0*|  -.0262869       .0095   -2.77   0.006  -.044899 -.007674         0
 Income1*|  -.0255364      .00916   -2.79   0.005  -.043493  -.00758         0
 Income2*|  -.0156665      .00852   -1.84   0.066  -.032362  .001029         0
 Income3*|  -.0098024      .00859   -1.14   0.254  -.026632  .007027         0
 Income5*|   -.001558      .00976   -0.16   0.873  -.020694  .017578         0
 Income6*|  -.0080994      .01011   -0.80   0.423  -.027912  .011714         0
 Income7*|   .0004829      .01056    0.05   0.964  -.020212  .021178         0
 Income8*|   .0103906      .00994    1.05   0.296  -.009085  .029866         0
```

```
 Income9*|   .0105315      .01135    0.93   0.353  -.011715  .032778         0
Income~s*|  -.0193658      .01083   -1.79   0.074  -.040588  .001856         0
     ed0*|  -.0204097      .00866   -2.36   0.018  -.037386 -.003433         0
     ed1*|  -.0037922      .00586   -0.65   0.518  -.015278  .007693         0
     ed3*|   .0028451      .00598    0.48   0.634  -.008871  .014561         0
     ed4*|  -.0200473       .0168   -1.19   0.233  -.052978  .012884         0
     ed5*|   .0201192      .01945    1.03   0.301  -.017999  .058237         0
  edMiss*|   .0024186      .02267    0.11   0.915   -.04201  .046847         0
 employ1*|  -.0118965      .00589   -2.02   0.043  -.023441 -.000352         0
 employ2*|  -.0348424      .01303   -2.67   0.007  -.060377 -.009308         0
 employ3*|   .0197404      .00844    2.34   0.019   .003191   .03629         0
 employ4*|  -.0092546      .02684   -0.34   0.730   -.06186   .04335         0
 employ5*|   .0396039      .04299    0.92   0.357  -.044664  .123872         0
 employ6*|  -.0220069      .01237   -1.78   0.075  -.046255  .002241         0
 employ7*|   .0271212       .0124    2.19   0.029   .002815  .051427         0
 employ9*|  -.0013829      .01297   -0.11   0.915  -.026801  .024035         0
employ~s*|   .0159507      .03573    0.45   0.655  -.054078   .08598         0
    Kid1*|  -.0233276      .00797   -2.93   0.003  -.038942 -.007713         0
    Kid2*|  -.0097093      .00881   -1.10   0.271  -.026985  .007566         0
    Kid3*|  -.0292969      .01051   -2.79   0.005  -.049894   -.0087         0
    Kid4*|  -.0329335      .01432   -2.30   0.021  -.061004 -.004863         0
    Kid5*|  -.0473004      .01534   -3.08   0.002  -.077376 -.017225         0
    Kid6*|   .0157458      .09017    0.17   0.861  -.160993  .192484         0
 KidMiss*|   .0035975      .02399    0.15   0.881  -.043418  .050613         0
Provid~m*|    .012554       .0073    1.72   0.086  -.001755  .026863         0
Provid~n*|   .0128928      .00912    1.41   0.158   -.00499  .030776         0
Provid~s*|   .0086338      .01424    0.61   0.544  -.019279  .036546         0
conserve*|   .0039161      .00561    0.70   0.485   -.00707  .014902         0
conser~s*|   .0148189      .01748    0.85   0.397  -.019439  .049076         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Individual Risk for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(IndRisk==7) (predict, p outcome(7))
         =  .14006625
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]       X
---------+--------------------------------------------------------------------
  Africa*|  -.0321918       .0229   -1.41   0.160  -.077081  .012697         0
 Pacific*|  -.0199982      .01784   -1.12   0.262  -.054955  .014959         0
 LatinAm*|  -.0603766      .02069   -2.92   0.004  -.100933  -.01982         0
 WestEur*|  -.0368047      .01984   -1.86   0.064  -.075683  .002073         0
SouthEur*|   -.077603       .0256   -3.03   0.002  -.127776  -.02743         0
     USA*|  -.0102841      .01429   -0.72   0.472  -.038287  .017719         0
  Canada*|   .0182715       .0124    1.47   0.141  -.006031  .042574         0
EastAsia*|  -.0160071      .03795   -0.42   0.673   -.09038  .058366         0
    Scan*|   .0033547      .02195    0.15   0.879  -.039662  .046372         0
 MidEast*|   .0115719      .04653    0.25   0.804  -.079618  .102762         0
 EastEur*|  -.0330577      .06559   -0.50   0.614  -.161616  .095501         0
    lot2*|   .0134614      .01067    1.26   0.207  -.007458  .034381         0
    lot3*|   .0394457       .0221    1.78   0.074  -.003876  .082768         0
    lot4*|    .055543      .02479    2.24   0.025   .006948  .104138         0
 lotMiss*|  -.0545213      .05841   -0.93   0.351  -.168994  .059952         0
   seat2*|  -.0071639      .01109   -0.65   0.518  -.028908   .01458         0
   seat3*|   -.017773      .01299   -1.37   0.171  -.043233  .007687         0
```

seatMiss*|	-.0014597	.03937	-0.04	0.970	-.078619	.075699	0
smoke1*|	.016534	.02261	0.73	0.465	-.027771	.060839	0
smoke2*|	.0119611	.01322	0.91	0.365	-.01394	.037863	0
smoke3*|	-.0155129	.01329	-1.17	0.243	-.041568	.010543	0
smoke4*|	.0044465	.01474	0.30	0.763	-.024437	.03333	0
smokeM~s*|	.0090666	.0448	0.20	0.840	-.078731	.096864	0
pol0*|	.046427	.01787	2.60	0.009	.01141	.081444	0
pol1*|	.0258351	.01286	2.01	0.045	.00063	.051041	0
pol3*|	-.0186147	.01289	-1.44	0.149	-.043879	.006649	0
pol4*|	-.0780922	.01771	-4.41	0.000	-.112804	-.043381	0
polMiss*|	.0944469	.05784	1.63	0.103	-.018923	.207817	0
fin*|	-.0738405	.01384	-5.34	0.000	-.100959	-.046722	0
finMiss*|	-.018165	.01751	-1.04	0.300	-.052484	.016154	0
CCYou0*|	.0071519	.03349	0.21	0.831	-.058488	.072792	0
CCYou1*|	.0134979	.01932	0.70	0.485	-.024368	.051364	0
CCYou3*|	.0386807	.01706	2.27	0.023	.005236	.072125	0
CCYou4*|	.0695399	.0222	3.13	0.002	.026023	.113057	0
CCYouM~s*|	.1031051	.10979	0.94	0.348	-.112083	.318293	0
CCWorld0*|	-.0179388	.03591	-0.50	0.617	-.088316	.052438	0
CCWorld1*|	-.0261936	.02345	-1.12	0.264	-.072151	.019764	0
CCWorld3*|	-.0172585	.0178	-0.97	0.332	-.052137	.01762	0
CCWorld4*|	-.0411248	.01852	-2.22	0.026	-.077424	-.004825	0
female*|	.0649294	.01274	5.10	0.000	.039967	.089892	0
gender~s*|	.0314078	.07013	0.45	0.654	-.106046	.168862	0
age |	-.0003371	.0007	-0.48	0.632	-.001715	.001041	29.67
Househ~d |	-.0043454	.00399	-1.09	0.276	-.01217	.003479	2.95
Income0*|	.0785096	.02753	2.85	0.004	.024553	.132466	0
Income1*|	.0751687	.02403	3.13	0.002	.02807	.122268	0
Income2*|	.0389211	.0199	1.96	0.050	-.000073	.077915	0
Income3*|	.0223397	.01914	1.17	0.243	-.015168	.059848	0
Income5*|	.0031867	.01999	0.16	0.873	-.035997	.042371	0
Income6*|	.0180301	.02292	0.79	0.431	-.026889	.06295	0
Income7*|	-.0009635	.02105	-0.05	0.963	-.042212	.040285	0
Income8*|	-.0185409	.01785	-1.04	0.299	-.053525	.016443	0
Income9*|	-.0187644	.01969	-0.95	0.341	-.057361	.019832	0
Income~s*|	.0510585	.0308	1.66	0.097	-.009313	.11143	0
ed0*|	.0547657	.02668	2.05	0.040	.002466	.107066	0
ed1*|	.0079765	.01255	0.64	0.525	-.016614	.032567	0
ed3*|	-.0055201	.01145	-0.48	0.630	-.027955	.016915	0
ed4*|	.0534636	.05719	0.93	0.350	-.058617	.165544	0
ed5*|	-.0325564	.02564	-1.27	0.204	-.082814	.017702	0
edMiss*|	-.004716	.04293	-0.11	0.913	-.088863	.079431	0
employ1*|	.0279322	.01389	2.01	0.044	.000717	.055147	0
employ2*|	.1257266	.06414	1.96	0.050	.000023	.25143	0
employ3*|	-.0320593	.01302	-2.46	0.014	-.057581	-.006537	0
employ4*|	.020931	.06798	0.31	0.758	-.112307	.154169	0
employ5*|	-.0540731	.04075	-1.33	0.184	-.133933	.025786	0
employ6*|	.06071	.04344	1.40	0.162	-.024431	.145851	0
employ7*|	-.0411429	.01581	-2.60	0.009	-.072126	-.01016	0
employ9*|	.0028224	.02681	0.11	0.916	-.049714	.055359	0
employ~s*|	-.0268817	.05092	-0.53	0.598	-.126684	.07292	0
Kid1*|	.0658936	.02422	2.72	0.007	.018433	.113354	0
Kid2*|	.0220987	.02184	1.01	0.312	-.020716	.064913	0
Kid3*|	.0930207	.04149	2.24	0.025	.011702	.174339	0
Kid4*|	.1134247	.07486	1.52	0.130	-.033308	.260157	0
Kid5*|	.2618932	.18093	1.45	0.148	-.092731	.616518	0
Kid6*|	-.0265906	.12819	-0.21	0.836	-.277833	.224652	0
KidMiss*|	-.0069194	.04418	-0.16	0.876	-.093509	.07967	0
Provid~m*|	-.0218996	.01234	-1.77	0.076	-.046088	.002289	0
Provid~n*|	-.0224121	.01457	-1.54	0.124	-.050973	.006149	0
Provid~s*|	-.0156988	.02373	-0.66	0.508	-.062206	.030808	0
conserve*|	-.0075048	.01027	-0.73	0.465	-.027631	.012621	0
conser~s*|	-.0252593	.02539	-0.99	0.320	-.075022	.024504	0

(*) dy/dx is for discrete change of dummy variable from 0 to 1

OutputAVI.2: Stata assisted OPM fit for: Social Risk and associated marginal effects assuming the representative agent with reference categories defined in TablesAVI.1-3. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*OPM specification for Social Risk*/

```
. oprobit SocialRisk  Africa Pacific LatinAm WestEur SouthEur USA Canada EastAs
> ia Scan MidEast EastEur lot2 lot3 lot4 lotMiss seat2 seat3 seatMiss smoke1 sm
> oke2 smoke3 smoke4 smokeMiss pol0 pol1 pol3 pol4 polMiss fin finMiss CCYou0 C
> CYou1 CCYou3 CCYou4 CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss
>  female genderMiss age ageMiss householdMiss Household Income0 Income1 Income
> 2 Income3 Income5 Income6 Income7 Income8 Income9 IncomeMiss ed0 ed1 ed3 ed4
> ed5 edMiss employ1 employ2 employ3 employ4 employ5 employ6 employ7 employ9 em
> ployMiss Kid1 Kid2 Kid3 Kid4 Kid5 Kid6 KidMiss ProvideDum ProvideUn ProvideMi
> ss conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
note: householdMiss dropped because of collinearity
Iteration 0:   log likelihood = -4847.7348
Iteration 1:   log likelihood = -4746.6916
Iteration 2:   log likelihood = -4746.6634
Iteration 3:   log likelihood = -4746.6634

Ordered probit regression                       Number of obs   =       2724
                                                LR chi2(80)     =     202.14
                                                Prob > chi2     =     0.0000
Log likelihood = -4746.6634                     Pseudo R2       =     0.0208

------------------------------------------------------------------------------
  SocialRisk |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |   .0820278   .1242091     0.66   0.509    -.1614175    .3254731
     Pacific |  -.0668658   .0893435    -0.75   0.454    -.2419759    .1082442
     LatinAm |   -.357831   .1240857    -2.88   0.004    -.6010344   -.1146276
     WestEur |   .0388289     .10944     0.35   0.723    -.1756696    .2533274
    SouthEur |  -.3833506   .1906825    -2.01   0.044    -.7570813   -.0096198
         USA |  -.0773248   .0690131    -1.12   0.263     -.212588    .0579385
      Canada |  -.0227845   .0550704    -0.41   0.679    -.1307205    .0851514
    EastAsia |  -.0629605   .1905255    -0.33   0.741    -.4363837    .3104627
        Scan |   .0370665     .10144     0.37   0.715    -.1617522    .2358851
     MidEast |  -.1992783   .2047808    -0.97   0.330    -.6006414    .2020847
     EastEur |  -.2927883   .3686551    -0.79   0.427    -1.015339    .4297624
        lot2 |   .0202456   .0477404     0.42   0.672    -.0733239    .1138151
        lot3 |  -.0606642   .0902132    -0.67   0.501    -.2374789    .1161505
        lot4 |   .1433955    .096072     1.49   0.136    -.0449022    .3316933
     lotMiss |  -.0580068   .4068694    -0.14   0.887    -.8554561    .7394426
       seat2 |  -.0111132   .0536859    -0.21   0.836    -.1163356    .0941092
       seat3 |  -.0638206   .0647176    -0.99   0.324    -.1906647    .0630236
    seatMiss |  -.3560614   .1877177    -1.90   0.058    -.7239813    .0118585
      smoke1 |   .0101128   .0991984     0.10   0.919    -.1843124    .2045381
      smoke2 |   .1129075    .059116     1.91   0.056    -.0029578    .2287727
      smoke3 |  -.0452744   .0665691    -0.68   0.496    -.1757474    .0851986
      smoke4 |  -.0652576   .0684609    -0.95   0.340    -.1994384    .0689233
   smokeMiss |   .0994596   .2190308     0.45   0.650    -.3298329    .5287521
        pol0 |    .220458   .0706543     3.12   0.002     .0819781    .3589379
        pol1 |   .1085864   .0568785     1.91   0.056    -.0028934    .2200662
        pol3 |   .0455523   .0625218     0.73   0.466    -.0769882    .1680928
        pol4 |    .005967   .0845886     0.07   0.944    -.1598235    .1717576
     polMiss |  -.0095749   .2321334    -0.04   0.967    -.4645479    .4453982
         fin |  -.2637533   .0519536    -5.08   0.000    -.3655804   -.1619262
     finMiss |   .0307292   .0947935     0.32   0.746    -.1550626     .216521
      CCYou0 |  -.0309225   .1561106    -0.20   0.843    -.3368936    .2750487
```

CCYou1	.0609593	.0872227	0.70	0.485	-.1099941	.2319126
CCYou3	.0908181	.0722895	1.26	0.209	-.0508666	.2325028
CCYou4	.1629489	.0830511	1.96	0.050	.0001717	.3257261
CCYouMiss	.6672397	.45128	1.48	0.139	-.2172528	1.551732
CCWorld0	-.088822	.1880398	-0.47	0.637	-.4573732	.2797292
CCWorld1	-.1737752	.1214237	-1.43	0.152	-.4117614	.0642109
CCWorld3	-.1524543	.0888347	-1.72	0.086	-.3265671	.0216585
CCWorld4	-.1905573	.0949435	-2.01	0.045	-.3766432	-.0044714
female	.2399616	.0439444	5.46	0.000	.1538322	.326091
genderMiss	.6406386	.3178384	2.02	0.044	.0176868	1.26359
age	.0023701	.0033258	0.71	0.476	-.0041484	.0088886
Household	-.0220921	.0187565	-1.18	0.239	-.0588542	.01467
Income0	.2679929	.1008683	2.66	0.008	.0702947	.4656911
Income1	.1698379	.0905036	1.88	0.061	-.0075458	.3472217
Income2	.1164871	.0843236	1.38	0.167	-.0487841	.2817583
Income3	.0873356	.0849278	1.03	0.304	-.0791198	.2537911
Income5	.0620631	.0931237	0.67	0.505	-.120456	.2445822
Income6	.1753421	.1012482	1.73	0.083	-.0231007	.3737849
Income7	-.0195026	.0976972	-0.20	0.842	-.2109855	.1719803
Income8	-.0698067	.0866299	-0.81	0.420	-.2395981	.0999848
Income9	.0790774	.0971756	0.81	0.416	-.1113832	.2695381
IncomeMiss	.2373992	.1261969	1.88	0.060	-.0099421	.4847405
ed0	.1141654	.104145	1.10	0.273	-.089955	.3182859
ed1	.0904465	.0579685	1.56	0.119	-.0231698	.2040627
ed3	-.0093027	.0543219	-0.17	0.864	-.1157716	.0971662
ed4	.2813409	.2107584	1.33	0.182	-.131738	.6944199
ed5	-.2916792	.1417425	-2.06	0.040	-.5694894	-.0138689
edMiss	.0412218	.2285824	0.18	0.857	-.4067916	.4892352
employ1	-.0384777	.05752	-0.67	0.504	-.1512148	.0742594
employ2	-.3117525	.1988815	-1.57	0.117	-.7015531	.0780481
employ3	-.1091324	.0625206	-1.75	0.081	-.2316705	.0134057
employ4	.3083957	.3260808	0.95	0.344	-.3307109	.9475023
employ5	-.1704947	.2665211	-0.64	0.522	-.6928666	.3518771
employ6	.1531623	.1662778	0.92	0.357	-.1727362	.4790607
employ7	.0113714	.0822895	0.14	0.890	-.149913	.1726558
employ9	.0525851	.1294027	0.41	0.684	-.2010395	.3062098
employMiss	-.5243446	.2674796	-1.96	0.050	-1.048595	-.0000942
Kid1	.1156412	.0853951	1.35	0.176	-.0517301	.2830126
Kid2	-.0596813	.0926425	-0.64	0.519	-.2412572	.1218946
Kid3	.1347525	.1361	0.99	0.322	-.1319987	.4015036
Kid4	.1101403	.2376018	0.46	0.643	-.3555507	.5758313
Kid5	.8731106	.4878372	1.79	0.073	-.0830328	1.829254
Kid6	-.5525968	.7564762	-0.73	0.465	-2.035263	.9300693
KidMiss	-.0368331	.2165394	-0.17	0.865	-.4612425	.3875763
ProvideDum	-.0794129	.0595072	-1.33	0.182	-.196045	.0372191
ProvideUn	-.0244868	.072698	-0.34	0.736	-.1669722	.1179987
ProvideMiss	-.1402328	.1312989	-1.07	0.286	-.3975739	.1171084
conserve	-.0086791	.0494986	-0.18	0.861	-.1056945	.0883364
conserveMiss	-.1737721	.1623027	-1.07	0.284	-.4918796	.1443354
/cut1	-1.898959	.1808677			-2.253453	-1.544464
/cut2	-1.472824	.1781203			-1.821934	-1.123715
/cut3	-1.206253	.1771431			-1.553447	-.8590585
/cut4	-.5334458	.1759483			-.8782981	-.1885935
/cut5	-.3856653	.1758375			-.7303004	-.0410302
/cut6	.4896708	.1758332			.1450441	.8342974
/cut7	.9308449	.1762585			.5853846	1.276305

/*Predicted Marginal Effects for Social Risk for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(SocialRisk==0) (predict, p outcome(0))
         =   .0284481
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|  -.0049389      .00711   -0.69   0.487  -.018868   .00899         0
 Pacific*|    .004639      .00655    0.71   0.479  -.008204  .017482         0
 LatinAm*|   .0325708      .01653    1.97   0.049    .00018  .064962         0
 WestEur*|  -.0024362      .00669   -0.36   0.716  -.015556  .010684         0
SouthEur*|   .0357123      .02527    1.41   0.158  -.013818  .085243         0
     USA*|   .0054181       .0052    1.04   0.298  -.004782  .015618         0
  Canada*|   .0015159      .00369    0.41   0.682  -.005723  .008755         0
EastAsia*|   .0043519      .01391    0.31   0.754  -.022908  .031612         0
    Scan*|  -.0023295      .00623   -0.37   0.708  -.014533  .009874         0
 MidEast*|   .0156651       .0193    0.81   0.417  -.022159  .053489         0
 EastEur*|    .025107      .04073    0.62   0.538  -.054728  .104942         0
    lot2*|  -.0012929      .00306   -0.42   0.672  -.007287  .004701         0
    lot3*|   .0041841      .00655    0.64   0.523  -.008658  .017026         0
    lot4*|  -.0081437      .00546   -1.49   0.136  -.018851  .002564         0
 lotMiss*|   .0039907      .02955    0.14   0.893  -.053934  .061915         0
   seat2*|   .0007312      .00356    0.21   0.837  -.006241  .007703         0
   seat3*|    .004415      .00477    0.93   0.355  -.004935  .013765         0
seatMiss*|   .0323575      .02334    1.39   0.166   -.01338  .078095         0
  smoke1*|  -.0006521      .00635   -0.10   0.918  -.013096  .011792         0
  smoke2*|  -.0066011      .00369   -1.79   0.073  -.013828  .000626         0
  smoke3*|   .0030773      .00474    0.65   0.516  -.006203  .012358         0
  smoke4*|   .0045205       .0051    0.89   0.375  -.005469   .01451         0
smokeM~s*|  -.0058899      .01193   -0.49   0.621  -.029264  .017485         0
    pol0*|  -.0116367       .0048   -2.42   0.015  -.021044 -.002229         0
    pol1*|  -.0063747      .00382   -1.67   0.095  -.013858  .001108         0
    pol3*|  -.0028398        .004   -0.71   0.477  -.010672  .004992         0
    pol4*|  -.0003863      .00547   -0.07   0.944  -.011107  .010334         0
 polMiss*|   .0006291      .01538    0.04   0.967  -.029516  .030774         0
     fin*|   .0220177      .00733    3.00   0.003   .007657  .036379         0
 finMiss*|  -.0019429      .00585   -0.33   0.740  -.013415  .009529         0
  CCYou0*|   .0020733      .01072    0.19   0.847  -.018929  .023076         0
  CCYou1*|  -.0037448      .00536   -0.70   0.485  -.014259  .006769         0
  CCYou3*|  -.0054226      .00451   -1.20   0.229  -.014256  .003411         0
  CCYou4*|  -.0090837      .00498   -1.82   0.068  -.018852  .000685         0
CCYouM~s*|  -.0233829      .01004   -2.33   0.020  -.043061 -.003705         0
CCWorld0*|   .0062919      .01428    0.44   0.659   -.02169  .034274         0
CCWorld1*|   .0133374      .01039    1.28   0.199  -.007027  .033702         0
CCWorld3*|   .0114686      .00686    1.67   0.095  -.001977  .024914         0
CCWorld4*|   .0148576      .00795    1.87   0.062  -.000731  .030446         0
  female*|  -.0124344      .00416   -2.99   0.003  -.020585 -.004284         0
gender~s*|  -.0229802      .00862   -2.67   0.008  -.039876 -.006084         0
     age |  -.0001543      .00022   -0.71   0.476  -.000578   .00027     29.67
Househ~d |   .0014383      .00127    1.13   0.258  -.001054  .003931      2.95
 Income0*|   -.013524      .00594   -2.28   0.023  -.025157 -.001891         0
 Income1*|  -.0094059      .00552   -1.70   0.089  -.020231  .001419         0
 Income2*|  -.0067872      .00523   -1.30   0.195  -.017045  .003471         0
 Income3*|   -.005232      .00528   -0.99   0.321  -.015574   .00511         0
 Income5*|  -.0038086      .00578   -0.66   0.510  -.015136  .007519         0
 Income6*|  -.0096601      .00594   -1.63   0.104  -.021307  .001987         0
 Income7*|   .0012935      .00651    0.20   0.842  -.011458  .014045         0
 Income8*|   .0048566      .00609    0.80   0.425  -.007079  .016792         0
```

```
 Income9*|  -.0047747      .00595   -0.80   0.422  -.016431  .006882         0
Income~s*|  -.0123315       .0067   -1.84   0.066   -.02546  .000797         0
     ed0*|  -.0066667      .00579   -1.15   0.249  -.018009  .004676         0
     ed1*|  -.0054023      .00361   -1.49   0.135  -.012487  .001682         0
     ed3*|    .000611      .00358    0.17   0.865   -.00641  .007632         0
     ed4*|  -.0140201      .00883   -1.59   0.112  -.031321  .003281         0
     ed5*|   .0249863      .01636    1.53   0.127   -.00708  .057053         0
  edMiss*|  -.0025804      .01376   -0.19   0.851  -.029544  .024383         0
 employ1*|   .0025985        .004    0.65   0.516   -.00524  .010437         0
 employ2*|   .0272044      .02265    1.20   0.230  -.017194  .071603         0
 employ3*|   .0078807      .00494    1.60   0.110  -.001796  .017557         0
 employ4*|  -.0149821      .01218   -1.23   0.219  -.038853  .008888         0
 employ5*|   .0130453      .02384    0.55   0.584  -.033684  .059775         0
 employ6*|   -.008618       .0084   -1.03   0.305  -.025072  .007836         0
 employ7*|  -.0007324      .00527   -0.14   0.889   -.01106  .009595         0
 employ9*|  -.0032563      .00775   -0.42   0.674  -.018437  .011924         0
employ~s*|   .0553817      .04249    1.30   0.192  -.027898  .138662         0
    Kid1*|  -.0067434      .00489   -1.38   0.168  -.016323  .002836         0
    Kid2*|   .0041124      .00677    0.61   0.544  -.009164  .017389         0
    Kid3*|  -.0077161      .00718   -1.07   0.283  -.021796  .006363         0
    Kid4*|  -.0064563      .01261   -0.51   0.609  -.031168  .018256         0
    Kid5*|  -.0257068      .00899   -2.86   0.004  -.043334 -.008079         0
    Kid6*|   .0598179      .12212    0.49   0.624  -.179538  .299174         0
 KidMiss*|   .0024835      .01513    0.16   0.870  -.027173  .032141         0
Provid~m*|   .0055755      .00443    1.26   0.209  -.003115  .014266         0
Provid~n*|   .0016318      .00492    0.33   0.740  -.008003  .011267         0
Provid~s*|   .0104284      .01125    0.93   0.354  -.011619  .032476         0
conserve*|   .0005697      .00328    0.17   0.862  -.005852  .006992         0
conser~s*|   .0133371      .01487    0.90   0.370  -.015809  .042483         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Social Risk for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(SocialRisk==7) (predict, p outcome(7))
         =  .17730197
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]       X
---------+--------------------------------------------------------------------
  Africa*|   .0221254      .03462    0.64   0.523  -.045736  .089987         0
 Pacific*|  -.0168402      .02216   -0.76   0.447  -.060272  .026591         0
 LatinAm*|  -.0776482      .02491   -3.12   0.002  -.126474 -.028823         0
 WestEur*|   .0102732      .02939    0.35   0.727  -.047325  .067871         0
SouthEur*|  -.0820427      .03455   -2.37   0.018  -.149755  -.01433         0
     USA*|  -.0193766      .01714   -1.13   0.258  -.052977  .014224         0
  Canada*|  -.0058595      .01416   -0.41   0.679  -.033622  .021903         0
EastAsia*|  -.0158864      .04683   -0.34   0.734  -.107681  .075908         0
    Scan*|   .0097991       .0272    0.36   0.719  -.043514  .063112         0
 MidEast*|   -.047002      .04418   -1.06   0.287  -.133598  .039594         0
 EastEur*|   -.065782      .07044   -0.93   0.350  -.203847  .072283         0
    lot2*|   .0053114      .01256    0.42   0.672  -.019303  .029926         0
    lot3*|  -.0153238      .02242   -0.68   0.494  -.059274  .028626         0
    lot4*|    .039717      .02798    1.42   0.156  -.015122  .094556         0
 lotMiss*|  -.0146712      .10007   -0.15   0.883  -.210811  .181469         0
   seat2*|  -.0028736      .01385   -0.21   0.836   -.03002  .024272         0
   seat3*|  -.0160968      .01616   -1.00   0.319  -.047777  .015584         0
seatMiss*|  -.0773381      .03556   -2.18   0.030  -.147029 -.007647         0
```

smoke1*|	.0026408	.026	0.10	0.919	-.048326	.053608	0
smoke2*|	.0308677	.01703	1.81	0.070	-.002507	.064243	0
smoke3*|	-.0115205	.01674	-0.69	0.491	-.044322	.021281	0
smoke4*|	-.0164479	.01698	-0.97	0.333	-.049735	.016839	0
smokeM~s*|	.027033	.06202	0.44	0.663	-.094533	.148599	0
pol0*|	.0630291	.02158	2.92	0.003	.020742	.105316	0
pol1*|	.0296309	.01568	1.89	0.059	-.001098	.06036	0
pol3*|	.0120887	.01659	0.73	0.466	-.020431	.044608	0
pol4*|	.0015552	.02206	0.07	0.944	-.041687	.044797	0
polMiss*|	-.0024776	.05982	-0.04	0.967	-.119726	.114771	0
fin*|	-.0601705	.01366	-4.41	0.000	-.086935	-.033406	0
finMiss*|	.0081004	.02533	0.32	0.749	-.041548	.057749	0
CCYou0*|	-.0079221	.03956	-0.20	0.841	-.085459	.069615	0
CCYou1*|	.0162897	.02356	0.69	0.489	-.029879	.062459	0
CCYou3*|	.0245912	.01986	1.24	0.216	-.014334	.063517	0
CCYou4*|	.0455051	.02437	1.87	0.062	-.002269	.093279	0
CCYouM~s*|	.2207254	.17348	1.27	0.203	-.119297	.560747	0
CCWorld0*|	-.0221342	.04539	-0.49	0.626	-.111095	.066826	0
CCWorld1*|	-.0415207	.02862	-1.45	0.147	-.097621	.014579	0
CCWorld3*|	-.0368186	.02251	-1.64	0.102	-.08094	.007302	0
CCWorld4*|	-.0451451	.02359	-1.91	0.056	-.091376	.001086	0
female*|	.0691383	.01436	4.81	0.000	.040988	.097288	0
gender~s*|	.2104981	.12225	1.72	0.085	-.029104	.4501	0
age |	.000616	.00086	0.71	0.476	-.001078	.00231	29.67
Househ~d |	-.0057421	.00488	-1.18	0.239	-.015297	.003813	2.95
Income0*|	.0780625	.03156	2.47	0.013	.016214	.139911	0
Income1*|	.0475652	.02606	1.83	0.068	-.003517	.098647	0
Income2*|	.0318955	.02333	1.37	0.172	-.013837	.077628	0
Income3*|	.0236122	.02308	1.02	0.306	-.021632	.068856	0
Income5*|	.0165928	.02501	0.66	0.507	-.032427	.065612	0
Income6*|	.0492188	.0294	1.67	0.094	-.008398	.106836	0
Income7*|	-.0050233	.02514	-0.20	0.842	-.05429	.044243	0
Income8*|	-.0175561	.02199	-0.80	0.425	-.060654	.025542	0
Income9*|	.0213019	.0264	0.81	0.420	-.030433	.073037	0
Income~s*|	.0683309	.03881	1.76	0.078	-.007732	.144394	0
ed0*|	.0312285	.02995	1.04	0.297	-.027479	.089936	0
ed1*|	.0244866	.01627	1.51	0.132	-.007401	.056374	0
ed3*|	-.0024075	.01404	-0.17	0.864	-.029928	.025113	0
ed4*|	.0823706	.06846	1.20	0.229	-.051801	.216543	0
ed5*|	-.0655712	.02879	-2.28	0.023	-.122003	-.00914	0
edMiss*|	.0109181	.0617	0.18	0.860	-.110011	.131848	0
employ1*|	-.0098226	.01463	-0.67	0.502	-.038489	.018844	0
employ2*|	-.0693417	.03915	-1.77	0.077	-.146076	.007392	0
employ3*|	-.0269275	.01579	-1.70	0.088	-.057884	.004029	0
employ4*|	.0912163	.10752	0.85	0.396	-.119512	.301945	0
employ5*|	-.0408043	.05863	-0.70	0.486	-.155723	.074114	0
employ6*|	.0425972	.04933	0.86	0.388	-.054091	.139286	0
employ7*|	.0029712	.02157	0.14	0.890	-.039306	.045249	0
employ9*|	.0139993	.03513	0.40	0.690	-.054854	.082853	0
employ~s*|	-.1037784	.04116	-2.52	0.012	-.184458	-.023098	0
Kid1*|	.0316524	.02459	1.29	0.198	-.016534	.079839	0
Kid2*|	-.0150826	.02293	-0.66	0.511	-.060029	.029864	0
Kid3*|	.0371865	.03977	0.94	0.350	-.040758	.115131	0
Kid4*|	.0300752	.06802	0.44	0.658	-.103235	.163386	0
Kid5*|	.3017291	.19462	1.55	0.121	-.079728	.683186	0
Kid6*|	-.1076373	.10215	-1.05	0.292	-.307855	.092581	0
KidMiss*|	-.00941	.05436	-0.17	0.863	-.115955	.097135	0
Provid~m*|	-.0198798	.01506	-1.32	0.187	-.049403	.009643	0
Provid~n*|	-.0062923	.0186	-0.34	0.735	-.042745	.03016	0
Provid~s*|	-.0340741	.03025	-1.13	0.260	-.093355	.025206	0
conserve*|	-.0022468	.01277	-0.18	0.860	-.027276	.022782	0
conser~s*|	-.04152	.0358	-1.16	0.246	-.111696	.028655	0

(*) dy/dx is for discrete change of dummy variable from 0 to 1

OutputAVI.3: Stata assisted OLS regressions on CC_You and CC_World.

```
. reg  ccyou   conserve conserveMiss ccworld politics

      Source |       SS       df       MS              Number of obs =    3035
-------------+------------------------------           F(  4,  3030) =  869.41
       Model |  2232.02771     4  558.006928           Prob > F      =  0.0000
    Residual |  1944.71891  3030  .641821422           R-squared     =  0.5344
-------------+------------------------------           Adj R-squared =  0.5338
       Total |  4176.74662  3034  1.37664688           Root MSE      =  .80114

------------------------------------------------------------------------------
       ccyou |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    conserve |  -.0406197   .0333928    -1.22   0.224    -.1060946    .0248552
conserveMiss |    .229337   .0877855     2.61   0.009     .0572117    .4014622
     ccworld |   .8193137    .014818    55.29   0.000     .7902593    .8483681
    politics |  -.0127559    .012837    -0.99   0.320     -.037926    .0124143
       _cons |   .1750866   .0600672     2.91   0.004     .0573099    .2928633
------------------------------------------------------------------------------
```

```
. reg  ccyou   conserve conserveMiss

      Source |       SS       df       MS              Number of obs =    3128
-------------+------------------------------           F(  2,  3125) =   29.85
       Model |  80.7806405     2  40.3903203           Prob > F      =  0.0000
    Residual |  4228.22415  3125  1.35303173           R-squared     =  0.0187
-------------+------------------------------           Adj R-squared =  0.0181
       Total |   4309.0048  3127  1.37799961           Root MSE      =  1.1632

------------------------------------------------------------------------------
       ccyou |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    conserve |   .3415699   .0466598     7.32   0.000     .2500829    .4330569
conserveMiss |   .3936306   .1201404     3.28   0.001     .1580685    .6291927
       _cons |   2.667594   .0250455   106.51   0.000     2.618487    2.716701
------------------------------------------------------------------------------
```

```
. reg  ccyou  fin finMiss age female genderMiss conserve
conserveMiss

      Source |       SS       df       MS              Number of obs =    3098
-------------+------------------------------           F(  7,  3090) =   19.91
       Model |  184.018631     7  26.2883759           Prob > F      =  0.0000
    Residual |  4079.19118  3090   1.3201266           R-squared     =  0.0432
-------------+------------------------------           Adj R-squared =  0.0410
       Total |  4263.20981  3097  1.37656113           Root MSE      =   1.149

------------------------------------------------------------------------------
       ccyou |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         fin |  -.0557506   .0520973    -1.07   0.285    -.1578995    .0463983
     finMiss |   .1324002   .0888659     1.49   0.136    -.0418419    .3066424
         age |  -.0023815   .0020174    -1.18   0.238     -.006337    .0015741
      female |   .3312642   .0423317     7.83   0.000     .2482631    .4142654
  genderMiss |  -.0684259   .2671136    -0.26   0.798     -.592164    .4553123
    conserve |   .3501213   .0477877     7.33   0.000     .2564224    .4438202
conserveMiss |   .4016364   .1247943     3.22   0.001     .1569482    .6463245
       _cons |   2.586066   .0689127    37.53   0.000     2.450947    2.721185
------------------------------------------------------------------------------
```

. reg ccworld fin finMiss age female genderMiss conserve conserveMiss

```
      Source |       SS       df       MS              Number of obs =    3052
-------------+------------------------------           F(  7,  3044) =   29.93
       Model |  212.031898     7  30.2902711           Prob > F      =  0.0000
    Residual |  3080.38488  3044  1.01195298           R-squared     =  0.0644
-------------+------------------------------           Adj R-squared =  0.0622
       Total |  3292.41678  3051   1.0791271           Root MSE      =   1.006

------------------------------------------------------------------------------
     ccworld |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         fin |  -.1059716    .046065    -2.30   0.021    -.1962933   -.0156499
     finMiss |   .0096402   .0786532     0.12   0.902    -.1445785    .1638589
         age |  -.0058811   .0017762    -3.31   0.001    -.0093637   -.0023985
      female |    .251325   .0373387     6.73   0.000     .1781134    .3245365
  genderMiss |  -.1233196   .2397482    -0.51   0.607    -.5934044    .3467653
    conserve |   .4904807    .042123    11.64   0.000     .4078884    .5730731
conserveMiss |   .2789676   .1102873     2.53   0.011     .0627225    .4952127
       _cons |   3.144113   .0607232    51.78   0.000     3.025051    3.263176
------------------------------------------------------------------------------
```

OutputAVI.4: Stata assisted OPM fit for: Social Risk and associated marginal effects assuming the representative agent with reduced attitudinal explanatory categories. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*Reduced OPM specification for Social Risk*/

```
. oprobit SocialRisk Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia
Scan MidEast EastEur pol0 pol1 pol3 pol4 polMiss CCYou0 CCYou1 CCYou3 CCYou4
CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss female genderMiss age
ageMiss Income0 Income1 Income2 Income3 Income5 Income6 Income7 Income8 Income9
IncomeMiss ed0 ed1 ed3 ed4 ed5 edMiss conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
Iteration 0:   log likelihood = -4861.9783
Iteration 1:   log likelihood = -4795.5335
Iteration 2:   log likelihood = -4795.5276

Ordered probit regression                       Number of obs   =       2731
                                                LR chi2(46)     =     132.90
                                                Prob > chi2     =     0.0000
Log likelihood = -4795.5276                     Pseudo R2       =     0.0137

------------------------------------------------------------------------------
  SocialRisk |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |   .0029539   .1196413     0.02   0.980    -.2315388    .2374466
     Pacific |  -.0579587    .087061    -0.67   0.506    -.2285952    .1126778
     LatinAm |  -.4074611   .1198423    -3.40   0.001    -.6423477   -.1725745
     WestEur |   .0230326   .1088007     0.21   0.832    -.1902129    .2362782
    SouthEur |  -.4242263   .1872579    -2.27   0.023     -.791245   -.0572075
         USA |  -.0713244    .067827    -1.05   0.293    -.2042629    .0616142
      Canada |  -.0206858   .0534667    -0.39   0.699    -.1254787     .084107
    EastAsia |  -.0702036   .1887324    -0.37   0.710    -.4401122    .2997051
        Scan |   .0471921   .0993895     0.47   0.635    -.1476077     .241992
     MidEast |  -.2793536   .2008921    -1.39   0.164    -.6730949    .1143876
     EastEur |  -.2704418   .3654745    -0.74   0.459    -.9867586    .4458749
        pol0 |   .2143543   .0698767     3.07   0.002     .0773986    .3513101
        pol1 |   .0997178   .0563635     1.77   0.077    -.0107527    .2101883
        pol3 |   .0410122   .0619149     0.66   0.508    -.0803388    .1623633
        pol4 |  -.0365216   .0835963    -0.44   0.662    -.2003673    .1273241
     polMiss |  -.0445479   .2261653    -0.20   0.844    -.4878237    .3987279
      CCYou0 |  -.0739632   .1552202    -0.48   0.634    -.3781892    .2302628
      CCYou1 |   .0500932   .0867213     0.58   0.564    -.1198774    .2200638
      CCYou3 |   .0822696   .0717145     1.15   0.251    -.0582882    .2228274
      CCYou4 |   .1340622   .0821305     1.63   0.103    -.0269107     .295035
   CCYouMiss |   .7649254   .4368384     1.75   0.080    -.0912622    1.621113
    CCWorld0 |  -.0963946   .1864738    -0.52   0.605    -.4618765    .2690872
    CCWorld1 |  -.1604003   .1205288    -1.33   0.183    -.3966324    .0758318
    CCWorld3 |   -.157342   .0879594    -1.79   0.074    -.3297393    .0150554
    CCWorld4 |  -.1753393   .0937542    -1.87   0.061    -.3590942    .0084156
      female |   .2871364   .0419555     6.84   0.000     .2049051    .3693676
  genderMiss |   .5490872   .3147612     1.74   0.081    -.0678335    1.166008
         age |    .003946    .002115     1.87   0.062    -.0001993    .0080914
     Income0 |   .2017105   .0965962     2.09   0.037     .0123855    .3910356
     Income1 |   .1323687   .0876227     1.51   0.131    -.0393687    .3041062
     Income2 |   .1331719   .0827122     1.61   0.107     -.028941    .2952848
     Income3 |   .0919738   .0836379     1.10   0.271    -.0719535    .2559012
     Income5 |   .0673813   .0922641     0.73   0.465    -.1134531    .2482156
     Income6 |   .1827394   .1005289     1.82   0.069    -.0142936    .3797725
     Income7 |  -.0125884    .096797    -0.13   0.897    -.2023071    .1771302
     Income8 |  -.0897393   .0852571    -1.05   0.293      -.25684    .0773615
     Income9 |   .0515612   .0961832     0.54   0.592    -.1369544    .2400768
```

```
  IncomeMiss |   .2157078   .1218392     1.77   0.077    -.0230925    .4545082
         ed0 |    .091754   .1007135     0.91   0.362    -.1056409    .2891489
         ed1 |   .0787651   .0562197     1.40   0.161    -.0314234    .1889536
         ed3 |  -.0133677   .0525838    -0.25   0.799      -.11643    .0896946
         ed4 |   .2735354   .2078996     1.32   0.188    -.1339403    .6810112
         ed5 |  -.2967877   .1404993    -2.11   0.035    -.5721612   -.0214142
      edMiss |   .0446946   .2241221     0.20   0.842    -.3945768    .4839659
    conserve |  -.0254846   .0487381    -0.52   0.601    -.1210095    .0700403
conserveMiss |  -.2306612   .1575169    -1.46   0.143    -.5393887    .0780662
-------------+----------------------------------------------------------------
       /cut1 |  -1.661559   .1411173                     -1.938144   -1.384974
       /cut2 |  -1.233209   .1373629                     -1.502435   -.9639827
       /cut3 |  -.9718861   .1361735                     -1.238781    -.704991
       /cut4 |  -.3111801    .134981                     -.5757381   -.0466221
       /cut5 |  -.1660329   .1349103                     -.4304522    .0983865
       /cut6 |   .6961356   .1353915                      .4307731    .9614981
       /cut7 |    1.13065    .136066                      .8639654    1.397334
------------------------------------------------------------------------------
```

/*Predicted Marginal Effects for Social Risk for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
      dummy variables are set to zero and age and household_members set to their
      mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)
```

```
. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(SocialRisk==0) (predict, p outcome(0))
         =  .03764957
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|  -.0002417      .00977   -0.02   0.980  -.019384  .018901         0
 Pacific*|    .005005      .00786    0.64   0.524  -.010397  .020407         0
 LatinAm*|   .0475103      .02031    2.34   0.019   .007709  .087312         0
 WestEur*|  -.0018509      .00861   -0.22   0.830  -.018724  .015022         0
SouthEur*|    .050153      .03106    1.61   0.106  -.010731  .111037         0
     USA*|   .0062323      .00627    0.99   0.320  -.006053  .018517         0
  Canada*|   .0017283      .00448    0.39   0.700  -.007055  .010512         0
EastAsia*|   .0061283      .01743    0.35   0.725  -.028035  .040292         0
    Scan*|  -.0037116      .00762   -0.49   0.626  -.018642  .011219         0
 MidEast*|   .0292504       .0263    1.11   0.266  -.022306  .080807         0
 EastEur*|   .0281026       .0472    0.60   0.552  -.064414  .120619         0
    pol0*|  -.0145184      .00568   -2.56   0.011  -.025648 -.003389         0
    pol1*|  -.0074833      .00463   -1.62   0.106  -.016555  .001588         0
    pol3*|  -.0032434      .00498   -0.65   0.515   -.01301  .006523         0
    pol4*|   .0030945      .00717    0.43   0.666  -.010954  .017143         0
 polMiss*|   .0038015      .02003    0.19   0.849  -.035453  .043056         0
  CCYou0*|    .006478      .01434    0.45   0.652  -.021633  .034589         0
  CCYou1*|  -.0039296      .00677   -0.58   0.562  -.017204  .009345         0
  CCYou3*|   -.006271       .0056   -1.12   0.262  -.017237  .004695         0
  CCYou4*|  -.0097563      .00612   -1.59   0.111  -.021756  .002244         0
CCYouM~s*|  -.0321632      .01135   -2.83   0.005  -.054407 -.009919         0
CCWorld0*|   .0086113      .01783    0.48   0.629  -.026333  .043555         0
CCWorld1*|   .0151561      .01237    1.22   0.221  -.009097  .039409         0
CCWorld3*|   .0148275      .00836    1.77   0.076  -.001556  .031211         0
CCWorld4*|   .0167848      .00938    1.79   0.074    -.0016   .03517         0
  female*|  -.0182247      .00503   -3.62   0.000  -.028088 -.008362         0
gender~s*|  -.0276862      .01104   -2.51   0.012  -.049318 -.006054         0
     age |  -.0003237      .00017   -1.87   0.062  -.000664  .000016     29.67
 Income0*|  -.0138174      .00715   -1.93   0.053   -.02783  .000195         0
 Income1*|  -.0096477      .00678   -1.42   0.155  -.022938  .003642         0
 Income2*|  -.0096993      .00646   -1.50   0.133  -.022359   .00296         0
```

```
 Income3*|  -.0069501      .00655   -1.06   0.289  -.019796  .005895         0
 Income5*|  -.0052049      .00719   -0.72   0.469   -.01929   .00888         0
 Income6*|  -.0127321      .00729   -1.75   0.081  -.027024   .00156         0
 Income7*|   .0010442      .00805    0.13   0.897  -.014725  .016813         0
 Income8*|   .0079699      .00769    1.04   0.300  -.007098  .023038         0
 Income9*|  -.0040395      .00755   -0.54   0.592  -.018828  .010749         0
Income~s*|  -.0145924      .00819   -1.78   0.075  -.030643  .001459         0
     ed0*|  -.0069349      .00725   -0.96   0.339  -.021142  .007272         0
     ed1*|  -.0060227      .00438   -1.37   0.169  -.014609  .002564         0
     ed3*|   .0011096      .00439    0.25   0.801  -.007499  .009718         0
     ed4*|  -.0175732      .01116   -1.58   0.115  -.039441  .004295         0
     ed5*|   .0315405      .01958    1.61   0.107  -.006837  .069918         0
  edMiss*|   -.003523      .01697   -0.21   0.836  -.036785  .029739         0
conserve*|   .0021383      .00419    0.51   0.610  -.006076  .010353         0
conser~s*|   .0231644      .01954    1.19   0.236  -.015124  .061453         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Social Risk for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)
```

```
. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(SocialRisk==7) (predict, p outcome(7))
         =  .15539378
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   .0007061      .02863    0.02   0.980  -.055417   .05683         0
 Pacific*|  -.0134281      .01983   -0.68   0.498  -.052286   .02543         0
 LatinAm*|    -.07774      .02126   -3.66   0.000  -.119406 -.036074         0
 WestEur*|   .0055618      .02652    0.21   0.834  -.046424  .057547         0
SouthEur*|   -.080148      .02933   -2.73   0.006  -.137628 -.022668         0
     USA*|  -.0164098      .01544   -1.06   0.288  -.046667  .013847         0
  Canada*|  -.0048857      .01264   -0.39   0.699  -.029668  .019897         0
EastAsia*|  -.0161614      .04208   -0.38   0.701   -.09863  .066308         0
    Scan*|   .0115336      .02475    0.47   0.641  -.036972  .060039         0
 MidEast*|  -.0573752      .03617   -1.59   0.113  -.128262  .013512         0
 EastEur*|   -.055825      .06427   -0.87   0.385  -.181795  .070145         0
    pol0*|   .0566886       .0197    2.88   0.004   .018077  .095301         0
    pol1*|   .0250033      .01423    1.76   0.079  -.002887  .052893         0
    pol3*|   .0099926      .01507    0.66   0.507  -.019538  .039523         0
    pol4*|   -.008556      .01952   -0.44   0.661  -.046808  .029696         0
 polMiss*|  -.0103931      .05165   -0.20   0.841  -.111616   .09083         0
  CCYou0*|  -.0169934      .03467   -0.49   0.624  -.084943  .050956         0
  CCYou1*|   .0122601      .02142    0.57   0.567  -.029718  .054238         0
  CCYou3*|   .0204551      .01806    1.13   0.257  -.014942  .055852         0
  CCYou4*|    .034169      .02177    1.57   0.116  -.008492   .07683         0
CCYouM~s*|   .2464237      .16799    1.47   0.142  -.082824  .575671         0
CCWorld0*|  -.0218868      .04079   -0.54   0.592  -.101837  .058063         0
CCWorld1*|  -.0351905      .02598   -1.35   0.176  -.086116  .015735         0
CCWorld3*|  -.0345769      .02035   -1.70   0.089  -.074457  .005303         0
CCWorld4*|  -.0381563      .02119   -1.80   0.072   -.07968  .003368         0
  female*|   .0783924      .01406    5.58   0.000   .050844   .10594         0
gender~s*|   .1657568      .11319    1.46   0.143  -.056089  .387603         0
     age |   .0009419       .0005    1.87   0.062  -.000048  .001931     29.67
 Income0*|   .0530421      .02636    2.01   0.044   .001385  .104699         0
 Income1*|   .0337104      .02249    1.50   0.134  -.010378  .077799         0
 Income2*|   .0339278      .02124    1.60   0.110    -.0077  .075556         0
 Income3*|   .0229756      .02093    1.10   0.272  -.018044  .063995         0
 Income5*|   .0166322       .0229    0.73   0.468  -.028257  .061521         0
```

Income6*|	.0476407	.02726	1.75	0.080	-.005782	.101063	0
Income7*|	-.0029855	.02294	-0.13	0.896	-.047942	.041971	0
Income8*|	-.0204475	.01967	-1.04	0.298	-.058992	.018097	0
Income9*|	.0126286	.02367	0.53	0.594	-.03377	.059027	0
Income~s*|	.0570812	.0343	1.66	0.096	-.010154	.124316	0
ed0*|	.0229183	.02626	0.87	0.383	-.028545	.074382	0
ed1*|	.0195504	.01438	1.36	0.174	-.008627	.047728	0
ed3*|	-.0031691	.01244	-0.25	0.799	-.027547	.021209	0
ed4*|	.0742455	.06308	1.18	0.239	-.049391	.197882	0
ed5*|	-.0603565	.02539	-2.38	0.017	-.110116	-.010597	0
edMiss*|	.0109097	.05595	0.19	0.845	-.098754	.120574	0
conserve*|	-.0060043	.01138	-0.53	0.598	-.028316	.016307	0
conser~s*|	-.0486867	.02973	-1.64	0.102	-.106965	.009592	0

(*) dy/dx is for discrete change of dummy variable from 0 to 1

OutputAVI.5: Stata assisted OPM fit for: Individual Risk and associated marginal effects assuming the representative agent with reduced attitudinal explanatory categories. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*Reduced OPM specification for Individual Risk*/

```
. oprobit IndRisk Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia Scan
MidEast EastEur pol0 pol1 pol3 pol4 polMiss CCYou0 CCYou1
> CCYou3 CCYou4 CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss female
genderMiss age ageMiss Income0 Income1 Income2 Income3 Incom
> e5 Income6 Income7 Income8 Income9 IncomeMiss ed0 ed1 ed3 ed4 ed5 edMiss conserve
conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
Iteration 0:   log likelihood = -5851.8815
Iteration 1:   log likelihood = -5684.9655
Iteration 2:   log likelihood = -5684.9365
Iteration 3:   log likelihood = -5684.9365

Ordered probit regression                       Number of obs   =       2985
                                                LR chi2(46)     =     333.89
                                                Prob > chi2     =     0.0000
Log likelihood = -5684.9365                     Pseudo R2       =     0.0285

------------------------------------------------------------------------------
     IndRisk |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |  -.2297346   .1147966    -2.00   0.045    -.4547318   -.0047373
     Pacific |  -.1125545   .0840701    -1.34   0.181    -.2773288    .0522199
     LatinAm |   -.359252   .1175592    -3.06   0.002    -.5896637   -.1288402
     WestEur |  -.1790321    .103146    -1.74   0.083    -.3811945    .0231303
    SouthEur |  -.4562245   .1773637    -2.57   0.010     -.803851    -.108598
         USA |  -.0547103   .0652425    -0.84   0.402    -.1825832    .0731627
      Canada |   .1115689   .0504943     2.21   0.027     .0126019     .210536
    EastAsia |  -.0956672   .1823443    -0.52   0.600    -.4530553     .261721
        Scan |   .0095215   .0949533     0.10   0.920    -.1765836    .1956266
     MidEast |  -.0241282   .1944646    -0.12   0.901    -.4052719    .3570155
     EastEur |  -.0768545    .348935    -0.22   0.826    -.7607545    .6070456
        pol0 |   .2008226   .0670389     3.00   0.003     .0694287    .3322165
        pol1 |   .0938313   .0530023     1.77   0.077    -.0100512    .1977139
        pol3 |  -.0903842   .0585047    -1.54   0.122    -.2050514    .0242829
        pol4 |  -.5040384   .0795564    -6.34   0.000    -.6599661   -.3481107
     polMiss |   .3531003   .1828102     1.93   0.053    -.0052011    .7114018
      CCYou0 |  -.0133493   .1449916    -0.09   0.927    -.2975276    .2708289
      CCYou1 |   .0350204   .0824882     0.42   0.671    -.1266535    .1966944
      CCYou3 |   .1509108   .0668448     2.26   0.024     .0198974    .2819243
      CCYou4 |    .258627   .0764844     3.38   0.001     .1087203    .4085338
   CCYouMiss |   .4490547   .3435414     1.31   0.191     -.224274    1.122383
    CCWorld0 |   -.082144   .1735468    -0.47   0.636    -.4222895    .2580014
    CCWorld1 |  -.0866536   .1139407    -0.76   0.447    -.3099733     .136666
    CCWorld3 |  -.0598108   .0803817    -0.74   0.457     -.217356    .0977345
    CCWorld4 |  -.1995251   .0857905    -2.33   0.020    -.3676713   -.0313789
      female |   .3335367   .0400578     8.33   0.000     .2550248    .4120485
  genderMiss |   .1146459   .2691277     0.43   0.670    -.4128347    .6421266
         age |   .0087261   .0020376     4.28   0.000     .0047324    .0127198
     Income0 |   .2130787   .0910619     2.34   0.019     .0346008    .3915567
     Income1 |   .2440085   .0832042     2.93   0.003     .0809312    .4070858
     Income2 |   .1592161   .0788261     2.02   0.043     .0047198    .3137123
     Income3 |   .0866915   .0797644     1.09   0.277    -.0696438    .2430269
```

```
     Income5 |   .0106388   .0881772     0.12   0.904    -.1621853    .1834629
     Income6 |   .0669622   .0965256     0.69   0.488    -.1222246    .2561489
     Income7 |  -.0076858   .0939539    -0.08   0.935     -.191832    .1764605
     Income8 |  -.1382994   .0814405    -1.70   0.089      -.29792    .0213211
     Income9 |  -.1264489   .0919672    -1.37   0.169    -.3067013    .0538036
  IncomeMiss |   .1973536   .1122227     1.76   0.079    -.0225987     .417306
         ed0 |   .2045468   .0915286     2.23   0.025      .025154    .3839396
         ed1 |   .0515134    .052898     0.97   0.330    -.0521649    .1551916
         ed3 |  -.0515515    .050595    -1.02   0.308    -.1507159     .047613
         ed4 |     .27185   .2048457     1.33   0.184    -.1296402    .6733402
         ed5 |  -.2228424   .1342885    -1.66   0.097     -.486043    .0403583
      edMiss |   .0015727   .1921211     0.01   0.993    -.3749777    .3781231
    conserve |  -.0531116   .0467984    -1.13   0.256    -.1448348    .0386117
conserveMiss |  -.1789346   .1259234    -1.42   0.155      -.42574    .0678708
-------------+----------------------------------------------------------------
       /cut1 |  -1.191315   .1302777                     -1.446654   -.9359751
       /cut2 |  -.6343385   .1277823                     -.8847871   -.3838898
       /cut3 |  -.3590677   .1272519                     -.6084768   -.1096586
       /cut4 |   .0906543   .1269988                     -.1582587    .3395673
       /cut5 |   .3000788   .1270408                      .0510835    .5490741
       /cut6 |   .9925074   .1277231                      .7421746     1.24284
       /cut7 |   1.404166   .1287028                      1.151913    1.656419
------------------------------------------------------------------------------
```

/*Predicted Marginal Effects for Individual Risk for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
      dummy variables are set to zero and age and household_members set to their
      mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(IndRisk==0) (predict, p outcome(0))
         =  .07349891
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|    .037642      .02197    1.71   0.087  -.005423  .080707         0
 Pacific*|   .0170042      .01368    1.24   0.214  -.009801   .04381         0
 LatinAm*|   .0641451      .02693    2.38   0.017   .011372  .116918         0
 WestEur*|   .0283324      .01847    1.53   0.125  -.007859  .064523         0
SouthEur*|   .0866142      .04436    1.95   0.051  -.000336  .173565         0
     USA*|   .0079325      .00975    0.81   0.416  -.011172  .027038         0
  Canada*|  -.0143298      .00694   -2.07   0.039  -.027922 -.000737         0
EastAsia*|   .0142815      .02899    0.49   0.622  -.042531  .071094         0
    Scan*|   -.001318      .01308   -0.10   0.920  -.026951  .024315         0
 MidEast*|   .0034223      .02803    0.12   0.903  -.051525  .058369         0
 EastEur*|   .0113208      .05425    0.21   0.835  -.095003  .117644         0
    pol0*|  -.0241337      .00886   -2.72   0.006  -.041502 -.006765         0
    pol1*|  -.0122107       .0073   -1.67   0.094   -.02651  .002088         0
    pol3*|   .0134424      .00885    1.52   0.129   -.00391  .030795         0
    pol4*|   .0985297       .0212    4.65   0.000   .056987  .140072         0
 polMiss*|  -.0378298       .0165   -2.29   0.022  -.070164 -.005496         0
  CCYou0*|   .0018788      .02056    0.09   0.927  -.038414  .042171         0
  CCYou1*|  -.0047585      .01115   -0.43   0.670  -.026617    .0171         0
  CCYou3*|  -.0188247      .00886   -2.13   0.034  -.036183 -.001466         0
  CCYou4*|  -.0297591      .00978   -3.04   0.002  -.048926 -.010592         0
CCYouM~s*|  -.0447346      .02505   -1.79   0.074  -.093823  .004354         0
CCWorld0*|   .0121456       .0269    0.45   0.652  -.040572  .064864         0
CCWorld1*|   .0128535      .01745    0.74   0.461  -.021345  .047052         0
CCWorld3*|   .0087038      .01158    0.75   0.452  -.013998  .031405         0
CCWorld4*|   .0320244      .01433    2.24   0.025   .003945  .060104         0
  female*|  -.0362671      .00786   -4.61   0.000  -.051672 -.020862         0
gender~s*|  -.0146915      .03178   -0.46   0.644  -.076973   .04759         0
```

```
     age |  -.0012163      .00035   -3.48   0.001  -.001902 -.000531     29.67
 Income0*|  -.0253724      .01144   -2.22   0.027  -.047789 -.002956         0
 Income1*|  -.0283878      .01092   -2.60   0.009  -.049793 -.006983         0
 Income2*|  -.0197381      .01044   -1.89   0.059  -.040207  .000731         0
 Income3*|  -.0113411      .01067   -1.06   0.288  -.032252   .00957         0
 Income5*|  -.0014715      .01219   -0.12   0.904  -.025363   .02242         0
 Income6*|  -.0088883      .01272   -0.70   0.485  -.033817   .01604         0
 Income7*|   .0010773      .01318    0.08   0.935  -.024761  .026916         0
 Income8*|   .0212749      .01279    1.66   0.096  -.003791   .04634         0
 Income9*|    .019291      .01452    1.33   0.184  -.009163  .047745         0
Income~s*|  -.0237786      .01326   -1.79   0.073  -.049769  .002212         0
     ed0*|  -.0245128      .01053   -2.33   0.020  -.045148 -.003877         0
     ed1*|  -.0069156      .00709   -0.98   0.329  -.020809  .006978         0
     ed3*|   .0074576      .00753    0.99   0.322  -.007294   .02221         0
     ed4*|  -.0309703      .01969   -1.57   0.116  -.069565  .007624         0
     ed5*|   .0363419      .02566    1.42   0.157  -.013959  .086642         0
  edMiss*|   -.000219      .02672   -0.01   0.993  -.052585  .052147         0
conserve*|   .0076919       .0071    1.08   0.278  -.006214  .021598         0
conser~s*|   .0283151       .0227    1.25   0.212  -.016182  .072812         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Social Risk for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(IndRisk==7) (predict, p outcome(7))
         =  .12605004
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   -.041484      .01922   -2.16   0.031  -.079145 -.003823         0
 Pacific*|  -.0218212      .01581   -1.38   0.168  -.052807  .009165         0
 LatinAm*|  -.0598257      .01792   -3.34   0.001  -.094952 -.024699         0
 WestEur*|  -.0333476      .01813   -1.84   0.066  -.068885   .00219         0
SouthEur*|  -.0714156      .02272   -3.14   0.002  -.115942 -.026889         0
     USA*|  -.0109753      .01294   -0.85   0.396  -.036335  .014384         0
  Canada*|   .0245895      .01148    2.14   0.032   .002082  .047097         0
EastAsia*|  -.0187343      .03396   -0.55   0.581  -.085297  .047828         0
    Scan*|   .0019823      .01985    0.10   0.920  -.036922  .040886         0
 MidEast*|  -.0049271       .0392   -0.13   0.900   -.08176  .071906         0
 EastEur*|  -.0152185      .06599   -0.23   0.818  -.144562  .114125         0
    pol0*|   .0464222      .01667    2.79   0.005   .013755  .079089         0
    pol1*|   .0204801      .01167    1.75   0.079  -.002398  .043358         0
    pol3*|  -.0177552      .01182   -1.50   0.133  -.040913  .005403         0
    pol4*|  -.0765071      .01587   -4.82   0.000  -.107606 -.045409         0
 polMiss*|   .0880828      .05326    1.65   0.098    -.0163  .192466         0
  CCYou0*|   -.002743      .02962   -0.09   0.926  -.060799  .055313         0
  CCYou1*|   .0073971      .01755    0.42   0.673  -.026994  .041788         0
  CCYou3*|   .0339756      .01565    2.17   0.030   .003303  .064648         0
  CCYou4*|   .0615873      .02017    3.05   0.002   .022049  .101126         0
CCYouM~s*|   .1170991      .10675    1.10   0.273   -.09212  .326318         0
CCWorld0*|  -.0162153      .03303   -0.49   0.624  -.080962  .048532         0
CCWorld1*|    -.01706      .02207   -0.77   0.439  -.060308  .026188         0
CCWorld3*|  -.0119627      .01635   -0.73   0.464  -.044002  .020076         0
CCWorld4*|  -.0367033      .01667   -2.20   0.028  -.069371 -.004035         0
  female*|   .0824242      .01324    6.23   0.000   .056482  .108367         0
gender~s*|   .0253101      .06306    0.40   0.688  -.098292  .148912         0
     age |   .0018068      .00048    3.76   0.000   .000865  .002749     29.67
 Income0*|   .0495705      .02221    2.23   0.026   .006031   .09311         0
```

Income1*|	.0576764	.02043	2.82	0.005	.017638	.097715	0
Income2*|	.0360049	.01807	1.99	0.046	.000597	.071413	0
Income3*|	.0188474	.01738	1.08	0.278	-.015212	.052907	0
Income5*|	.0022163	.01838	0.12	0.904	-.033809	.038242	0
Income6*|	.0143996	.02105	0.68	0.494	-.02685	.055649	0
Income7*|	-.0015844	.01935	-0.08	0.935	-.039518	.036349	0
Income8*|	-.0264026	.01603	-1.65	0.100	-.057826	.005021	0
Income9*|	-.0243123	.01775	-1.37	0.171	-.059105	.01048	0
Income~s*|	.0455377	.02761	1.65	0.099	-.008574	.099649	0
ed0*|	.047375	.0237	2.00	0.046	.000919	.093831	0
ed1*|	.0109823	.01149	0.96	0.339	-.011546	.03351	0
ed3*|	-.0103607	.01013	-1.02	0.307	-.030224	.009502	0
ed4*|	.0651689	.05583	1.17	0.243	-.044251	.174588	0
ed5*|	-.0404105	.02191	-1.84	0.065	-.083361	.00254	0
edMiss*|	.0003259	.03985	0.01	0.993	-.077783	.078435	0
conserve*|	-.0106645	.00927	-1.15	0.250	-.028831	.007502	0
conser~s*|	-.0333314	.02152	-1.55	0.121	-.075515	.008853	0

(*) dy/dx is for discrete change of dummy variable from 0 to 1

OutputAVI.6: Stata assisted OPM fit for: National Inequality and associated marginal effects assuming the representative agent with reduced attitudinal explanatory categories. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

```
/*Reduced OPM specification for National Inequality*/

oprobit  N_Inequal Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia Scan
MidEast EastEur pol0 pol1 pol3 pol4 polMiss CCYou0 CCYo
> u1 CCYou3 CCYou4 CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss female
genderMiss age ageMiss Income0 Income1 Income2 Income3 In
> come5 Income6 Income7 Income8 Income9 IncomeMiss ed0 ed1 ed3 ed4 ed5 edMiss
conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
Iteration 0:   log likelihood = -4882.3762
Iteration 1:   log likelihood =  -4505.097
Iteration 2:   log likelihood = -4503.5096
Iteration 3:   log likelihood = -4503.5095

Ordered probit regression                       Number of obs   =       2788
                                                LR chi2(46)     =     757.73
                                                Prob > chi2     =     0.0000
Log likelihood = -4503.5095                     Pseudo R2       =     0.0776

------------------------------------------------------------------------------
   N_Inequal |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |  -.4084824   .1261776    -3.24   0.001    -.6557859   -.1611789
     Pacific |  -.0314378   .0930596    -0.34   0.735    -.2138313    .1509557
     LatinAm |   .0031315   .1319556     0.02   0.981    -.2554967    .2617598
     WestEur |   .0909839   .1115547     0.82   0.415    -.1276594    .3096272
    SouthEur |   .1472465    .201673     0.73   0.465    -.2480253    .5425183
         USA |   .0475053   .0732243     0.65   0.516    -.0960117    .1910223
      Canada |   .0958832   .0567292     1.69   0.091    -.0153041    .2070704
    EastAsia |   -.055716   .1983886    -0.28   0.779    -.4445504    .3331185
        Scan |   .2167305   .1028619     2.11   0.035     .0151249    .4183362
     MidEast |  -.3175613       .205    -1.55   0.121    -.7193539    .0842312
     EastEur |  -.3957507   .3443295    -1.15   0.250    -1.070624    .2791226
        pol0 |   .6987534   .0755381     9.25   0.000     .5507015    .8468053
        pol1 |   .3083252   .0585683     5.26   0.000     .1935335    .4231169
        pol3 |  -.2983352   .0648725    -4.60   0.000     -.425483   -.1711875
        pol4 |   -.893844   .0923662    -9.68   0.000    -1.074878   -.7128096
     polMiss |   .0932038   .2103555     0.44   0.658    -.3190854     .505493
      CCYou0 |  -.0277067   .1702099    -0.16   0.871     -.361312    .3058985
      CCYou1 |  -.1689343   .0908245    -1.86   0.063     -.346947    .0090784
      CCYou3 |   .0822962    .074409     1.11   0.269    -.0635429    .2281352
      CCYou4 |   .1538094   .0853009     1.80   0.071    -.0133773    .3209961
   CCYouMiss |  -.2117556    .385929    -0.55   0.583    -.9681624    .5446513
    CCWorld0 |  -.2038985   .2084534    -0.98   0.328    -.6124597    .2046626
    CCWorld1 |  -.1971212   .1311043    -1.50   0.133    -.4540809    .0598386
    CCWorld3 |  -.0377793   .0903192    -0.42   0.676    -.2148017     .139243
    CCWorld4 |   .0691421   .0962372     0.72   0.472    -.1194794    .2577635
      female |   .2415396   .0442813     5.45   0.000     .1547498    .3283293
  genderMiss |   .2192058   .3316923     0.66   0.509    -.4308992    .8693108
         age |   .0064883   .0023135     2.80   0.005     .0019539    .0110227
     Income0 |   .0843598   .1024864     0.82   0.410    -.1165097    .2852294
     Income1 |   .2470656   .0930785     2.65   0.008     .0646351    .4294961
     Income2 |   .1053097     .08759     1.20   0.229    -.0663635    .2769829
     Income3 |   .1016937   .0889091     1.14   0.253     -.072565    .2759523
     Income5 |  -.0454179   .0974126    -0.47   0.641    -.2363431    .1455074
```

```
     Income6 |   .1809087   .1100782     1.64   0.100    -.0348406    .3966579
     Income7 |  -.0864467   .1049467    -0.82   0.410    -.2921385    .1192451
     Income8 |  -.2829326   .0910322    -3.11   0.002    -.4613524   -.1045127
     Income9 |  -.1602816   .1018767    -1.57   0.116    -.3599562     .039393
  IncomeMiss |  -.0788798   .1285455    -0.61   0.539    -.3308244    .1730647
         ed0 |  -.3901474   .1035112    -3.77   0.000    -.5930256   -.1872692
         ed1 |  -.0699522   .0600091    -1.17   0.244    -.1875679    .0476635
         ed3 |  -.0121353   .0559714    -0.22   0.828    -.1218372    .0975667
         ed4 |  -.0070803   .2306766    -0.03   0.976    -.4591981    .4450375
         ed5 |   .1483123   .1486736     1.00   0.318    -.1430827    .4397072
      edMiss |   .0937355   .2280213     0.41   0.681    -.3531781    .5406492
    conserve |   .2330585     .05201     4.48   0.000     .1311207    .3349962
conserveMiss |   .1720677   .1581674     1.09   0.277    -.1379346    .4820701
-------------+----------------------------------------------------------------
       /cut1 |  -.3533233   .1405812                     -.6288574   -.0777893
       /cut2 |  -.2208959   .1404522                      -.496177    .0543853
       /cut3 |  -.1140503   .1404031                     -.3892353    .1611348
       /cut4 |   .0380454   .1403868                     -.2371077    .3131985
       /cut5 |   .3117603   .1404138                      .0365543    .5869663
       /cut6 |   .5990073   .1405801                      .3234753    .8745394
       /cut7 |   .9417237    .141024                      .6653217    1.218126
------------------------------------------------------------------------------
```

/*Predicted Marginal Effects for National Inequality for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
      dummy variables are set to zero and age and household_members set to their
      mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)


. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(N_Inequal==0) (predict, p outcome(0))
         =  .29259091
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   .1527865      .04967    3.08   0.002   .055439  .250134         0
 Pacific*|   .0108975      .03245    0.34   0.737   -.05271  .074505         0
 LatinAm*|  -.0010755      .04528   -0.02   0.981  -.089828  .087677         0
 WestEur*|  -.0304683      .03662   -0.83   0.405  -.102243  .041306         0
SouthEur*|  -.0484606      .06348   -0.76   0.445  -.172881   .07596         0
     USA*|   -.016113      .02466   -0.65   0.514  -.064453  .032227         0
  Canada*|  -.0320617      .01906   -1.68   0.093  -.069414  .005291         0
EastAsia*|   .0194352      .07011    0.28   0.782   -.11797   .15684         0
    Scan*|  -.0697286      .03176   -2.20   0.028  -.131984 -.007473         0
 MidEast*|   .1171272      .07954    1.47   0.141  -.038761  .273015         0
 EastEur*|   .1477596      .13587    1.09   0.277  -.118543  .414063         0
    pol0*|  -.1859487      .02637   -7.05   0.000  -.237631 -.134267         0
    pol1*|  -.0960818       .0201   -4.78   0.000  -.135469 -.056695         0
    pol3*|   .1096712      .02411    4.55   0.000   .062416  .156927         0
    pol4*|   .3434937        .034   10.10   0.000   .276849  .410138         0
 polMiss*|  -.0311909      .06865   -0.45   0.650  -.165741  .103359         0
  CCYou0*|   .0095947      .05929    0.16   0.871  -.106603  .125792         0
  CCYou1*|   .0605341      .03304    1.83   0.067  -.004217  .125285         0
  CCYou3*|  -.0276307      .02498   -1.11   0.269   -.07659  .021329         0
  CCYou4*|  -.0505151      .02777   -1.82   0.069  -.104945  .003915         0
CCYouM~s*|   .0765702      .14512    0.53   0.598  -.207863  .361004         0
CCWorld0*|   .0736098      .07786    0.95   0.344  -.078984  .226204         0
CCWorld1*|   .0710625      .04817    1.48   0.140   -.02335  .165475         0
CCWorld3*|   .0131175      .03126    0.42   0.675  -.048148  .074383         0
CCWorld4*|  -.0233048      .03252   -0.72   0.474  -.087039   .04043         0
  female*|  -.0770586      .01532   -5.03   0.000  -.107093 -.047024         0
gender~s*|  -.0704662      .09915   -0.71   0.477    -.2648  .123868         0
     age |  -.0022302      .00081   -2.76   0.006  -.003814 -.000646     29.67
```

```
 Income0*|  -.0283062      .03427   -0.83   0.409  -.095471  .038859         0
 Income1*|   -.078672      .03019   -2.61   0.009  -.137851 -.019493         0
 Income2*|  -.0351132      .02937   -1.20   0.232  -.092686   .02246         0
 Income3*|  -.0339448      .02983   -1.14   0.255  -.092402  .024512         0
 Income5*|   .0158011      .03394    0.47   0.641   -.05071  .082313         0
 Income6*|  -.0588983      .03538   -1.66   0.096  -.128236  .010439         0
 Income7*|    .030388      .03707    0.82   0.412  -.042275  .103051         0
 Income8*|   .1037234      .03335    3.11   0.002   .038364  .169083         0
 Income9*|   .0573241      .03671    1.56   0.118  -.014634  .129282         0
Income~s*|   .0276763      .04558    0.61   0.544  -.061664  .117017         0
     ed0*|   .1455501      .04073    3.57   0.000   .065722  .225378         0
     ed1*|   .0244893      .02123    1.15   0.249  -.017112   .06609         0
     ed3*|    .004185      .01933    0.22   0.829  -.033703  .042073         0
     ed4*|   .0024384      .07959    0.03   0.976  -.153551  .158427         0
     ed5*|  -.0487949      .04689   -1.04   0.298  -.140701  .043111         0
  edMiss*|  -.0313638      .07413   -0.42   0.672  -.176665  .113937         0
conserve*|  -.0745686      .01671   -4.46   0.000  -.107323 -.041815         0
conser~s*|  -.0561812      .04905   -1.15   0.252  -.152313  .039951         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for National Inequality for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)


. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(N_Inequal==7) (predict, p outcome(7))
         =  .22686364
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|    -.10337      .02934   -3.52   0.000  -.160878 -.045862         0
 Pacific*|  -.0093604      .02748   -0.34   0.733  -.063229  .044508         0
 LatinAm*|   .0009447      .03985    0.02   0.981  -.077158  .079047         0
 WestEur*|    .028331      .03567    0.79   0.427  -.041589  .098251         0
SouthEur*|   .0467337      .06713    0.70   0.486  -.084835  .178303         0
     USA*|   .0145663      .02271    0.64   0.521  -.029944  .059077         0
  Canada*|   .0299074       .0179    1.67   0.095   -.00518  .064995         0
EastAsia*|   -.016434      .05738   -0.29   0.775  -.128905  .096037         0
    Scan*|   .0703314      .03543    1.99   0.047   .000888  .139775         0
 MidEast*|  -.0838273      .04775   -1.76   0.079  -.177417  .009762         0
 EastEur*|  -.1007521      .07241   -1.39   0.164  -.242672  .041168         0
    pol0*|   .2530134      .02975    8.51   0.000   .194714  .311313         0
    pol1*|   .1027825      .02037    5.05   0.000   .062867  .142698         0
    pol3*|  -.0794408       .0193   -4.12   0.000  -.117278 -.041604         0
    pol4*|  -.1766783      .02802   -6.30   0.000  -.231606  -.12175         0
 polMiss*|   .0290446       .0675    0.43   0.667  -.103261  .161351         0
  CCYou0*|  -.0082613      .05033   -0.16   0.870  -.106915  .090392         0
  CCYou1*|  -.0475934      .02545   -1.87   0.061  -.097477   .00229         0
  CCYou3*|   .0255482      .02326    1.10   0.272  -.020039  .071135         0
  CCYou4*|   .0489224      .02785    1.76   0.079  -.005669  .103513         0
CCYouM~s*|  -.0585803      .09802   -0.60   0.550  -.250686  .133526         0
CCWorld0*|  -.0565975      .05411   -1.05   0.296  -.162655   .04946         0
CCWorld1*|  -.0548752      .03556   -1.54   0.123  -.124571  .014821         0
CCWorld3*|  -.0112212      .02697   -0.42   0.677  -.064089  .041647         0
CCWorld4*|   .0213653      .02972    0.72   0.472  -.036879   .07961         0
  female*|   .0789767      .01563    5.05   0.000   .048335  .109619         0
gender~s*|   .0711889      .11488    0.62   0.535  -.153963  .296341         0
     age |    .001955      .00072    2.71   0.007   .000542  .003368     29.67
 Income0*|   .0262077      .03208    0.82   0.414  -.036661  .089076         0
```

```
 Income1*|   .0809174      .03085    2.62   0.009   .020451  .141384         0
 Income2*|   .0329546      .02741    1.20   0.229   -.02077  .086679         0
 Income3*|   .0317835       .0278    1.14   0.253  -.022695  .086262         0
 Income5*|  -.0134503      .02883   -0.47   0.641  -.069947  .043046         0
 Income6*|   .0580497      .03622    1.60   0.109  -.012947  .129046         0
 Income7*|  -.0251912      .03046   -0.83   0.408  -.084883  .034501         0
 Income8*|  -.0758623      .02574   -2.95   0.003  -.126317 -.025407         0
 Income9*|  -.0453198       .0288   -1.57   0.116  -.101768  .011129         0
Income~s*|  -.0230554      .03702   -0.62   0.533  -.095607  .049496         0
     ed0*|  -.0995877       .0252   -3.95   0.000  -.148986  -.05019         0
     ed1*|  -.0205183      .01749   -1.17   0.241  -.054791  .013754         0
     ed3*|  -.0036399      .01676   -0.22   0.828  -.036488  .029208         0
     ed4*|  -.0021277      .06915   -0.03   0.975  -.137652  .133397         0
     ed5*|   .0470886      .04952    0.95   0.342  -.049966  .144143         0
  edMiss*|   .0292157      .07347    0.40   0.691  -.114786  .173217         0
conserve*|   .0760087      .01879    4.04   0.000   .039174  .112844         0
conser~s*|   .0550562      .05351    1.03   0.304  -.049821  .159933         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

OutputAVI.7: Stata assisted OPM fit for: Global Inequality and associated marginal effects assuming the representative agent with reduced attitudinal explanatory categories. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*Reduced OPM specification for Global Inequality*/

```
. oprobit G_Inequal  Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia
Scan MidEast EastEur pol0 pol1 pol3 pol4 polMiss CCYou0 CCYo
> u1 CCYou3 CCYou4 CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss female
genderMiss age ageMiss Income0 Income1 Income2 Income3 In
> come5 Income6 Income7 Income8 Income9 IncomeMiss ed0 ed1 ed3 ed4 ed5 edMiss
conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
Iteration 0:   log likelihood = -5214.4449
Iteration 1:   log likelihood = -4932.7078
Iteration 2:   log likelihood = -4932.3453
Iteration 3:   log likelihood = -4932.3453

Ordered probit regression                       Number of obs   =       2756
                                                LR chi2(46)     =     564.20
                                                Prob > chi2     =     0.0000
Log likelihood = -4932.3453                     Pseudo R2       =     0.0541

------------------------------------------------------------------------------
   G_Inequal |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |  -.3100468   .1233759    -2.51   0.012    -.5518592   -.0682345
     Pacific |  -.1047678   .0909503    -1.15   0.249    -.2830272    .0734916
     LatinAm |   -.168068   .1242452    -1.35   0.176    -.4115841    .0754482
     WestEur |  -.0578179   .1104062    -0.52   0.600    -.2742101    .1585742
    SouthEur |   -.175076    .193406    -0.91   0.365    -.5541448    .2039927
         USA |  -.1757663   .0705593    -2.49   0.013    -.3140599   -.0374727
      Canada |  -.0853652   .0547247    -1.56   0.119    -.1926236    .0218932
    EastAsia |  -.2454617   .1941133    -1.26   0.206    -.6259167    .1349933
        Scan |   .0367337   .1002792     0.37   0.714    -.1598099    .2332773
     MidEast |  -.3613901   .2000242    -1.81   0.071    -.7534304    .0306501
     EastEur |   .0280236    .385853     0.07   0.942    -.7282343    .7842816
        pol0 |   .4528718   .0728589     6.22   0.000     .3100709    .5956727
        pol1 |   .1399836   .0573127     2.44   0.015     .0276529    .2523144
        pol3 |  -.1881105   .0632802    -2.97   0.003    -.3121374   -.0640835
        pol4 |  -.7098859   .0867374    -8.18   0.000     -.879888   -.5398837
     polMiss |  -.0339316   .2035164    -0.17   0.868    -.4328165    .3649533
      CCYou0 |  -.0870779   .1624016    -0.54   0.592    -.4053792    .2312234
      CCYou1 |  -.1274452   .0871013    -1.46   0.143    -.2981605    .0432702
      CCYou3 |   .0665962   .0719598     0.93   0.355    -.0744425    .2076349
      CCYou4 |   .1367208   .0823297     1.66   0.097    -.0246424     .298084
   CCYouMiss |  -.1727687   .3473342    -0.50   0.619    -.8535313    .5079938
    CCWorld0 |  -.2860718   .1950298    -1.47   0.142    -.6683232    .0961797
    CCWorld1 |  -.2483266     .12431    -2.00   0.046    -.4919698   -.0046834
    CCWorld3 |  -.0340214    .086842    -0.39   0.695    -.2042286    .1361859
    CCWorld4 |   .1060242   .0926636     1.14   0.253    -.0755931    .2876415
      female |   .2325724   .0429238     5.42   0.000     .1484433    .3167014
  genderMiss |   .4602036   .3496307     1.32   0.188    -.2250599    1.145467
         age |   .0040003    .002222     1.80   0.072    -.0003547    .0083554
     Income0 |  -.0370967   .0994414    -0.37   0.709    -.2319984    .1578049
     Income1 |   .0675342   .0899134     0.75   0.453    -.1086928    .2437611
     Income2 |   .0070065   .0848791     0.08   0.934    -.1593534    .1733664
     Income3 |  -.0837628   .0863984    -0.97   0.332    -.2531004    .0855749
     Income5 |  -.1291796    .095516    -1.35   0.176    -.3163875    .0580283
     Income6 |   .1354039   .1053619     1.29   0.199    -.0711017    .3419094
     Income7 |  -.1788706   .1016799    -1.76   0.079    -.3781595    .0204184
```

```
     Income8 |  -.3370409   .0876161    -3.85   0.000    -.5087652   -.1653166
     Income9 |  -.1492242   .1000988    -1.49   0.136    -.3454143    .0469659
  IncomeMiss |   -.016128   .1220263    -0.13   0.895    -.2552952    .2230392
         ed0 |  -.5176243   .1000017    -5.18   0.000    -.7136239   -.3216246
         ed1 |  -.0379403   .0571517    -0.66   0.507    -.1499557     .074075
         ed3 |  -.0001967   .0541207    -0.00   0.997    -.1062713    .1058779
         ed4 |  -.1172241   .2210291    -0.53   0.596    -.5504331    .3159849
         ed5 |  -.0261108      .1515    -0.17   0.863    -.3230452    .2708237
      edMiss |  -.1368254   .2133207    -0.64   0.521    -.5549262    .2812755
    conserve |   .2001404   .0505343     3.96   0.000      .101095    .2991859
conserveMiss |   .0742646   .1548246     0.48   0.631    -.2291861    .3777153
-------------+----------------------------------------------------------------
       /cut1 |  -1.040893   .1376367                     -1.310656   -.7711298
       /cut2 |  -.7840966   .1369773                     -1.052567    -.515626
       /cut3 |  -.5472389   .1366223                     -.8150138    -.279464
       /cut4 |  -.3104462   .1364253                     -.5778348   -.0430576
       /cut5 |   .2204827   .1363891                     -.0468351    .4878005
       /cut6 |   .5714525    .136578                      .3037646    .8391405
       /cut7 |   .7463592   .1367554                      .4783236    1.014395
------------------------------------------------------------------------------
```

/*Predicted Marginal Effects for Global Inequality for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)


. mfx, predict(p outcome(0)) at(A)

Marginal effects after oprobit
      y  = Pr(G_Inequal==0) (predict, p outcome(0))
         =  .12310937
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   .0746822      .03463    2.16   0.031   .006815  .142549         0
 Pacific*|   .0226456      .02067    1.10   0.273  -.017876  .063168         0
 LatinAm*|   .0376078      .03044    1.24   0.217  -.022052  .097268         0
 WestEur*|   .0121726      .02391    0.51   0.611  -.034681  .059027         0
SouthEur*|   .0393239      .04763    0.83   0.409  -.054022   .13267         0
     USA*|   .0394935      .01742    2.27   0.023   .005355  .073632         0
  Canada*|   .0182532      .01194    1.53   0.126  -.005151  .041657         0
EastAsia*|   .0572173      .05088    1.12   0.261  -.042512  .156946         0
    Scan*|  -.0073228       .0197   -0.37   0.710  -.045938  .031293         0
 MidEast*|     .08927      .05822    1.53   0.125   -.02484   .20338         0
 EastEur*|  -.0056151      .07606   -0.07   0.941  -.154692  .143462         0
    pol0*|  -.0696778      .01533   -4.55   0.000  -.099719 -.039636         0
    pol1*|  -.0262346      .01154   -2.27   0.023  -.048859  -.00361         0
    pol3*|   .0425472      .01501    2.83   0.005   .013123  .071971         0
    pol4*|   .2033551       .0324    6.28   0.000   .139857  .266854         0
 polMiss*|   .0070472      .04301    0.16   0.870  -.077259  .091354         0
  CCYou0*|   .0186373      .03617    0.52   0.606  -.052258  .089532         0
  CCYou1*|   .0278945      .01977    1.41   0.158  -.010849  .066638         0
  CCYou3*|  -.0130437      .01414   -0.92   0.356  -.040764  .014676         0
  CCYou4*|  -.0256739      .01544   -1.66   0.096  -.055927  .004579         0
CCYouM~s*|   .0387575      .08468    0.46   0.647  -.127207  .204722         0
CCWorld0*|   .0680829      .05231    1.30   0.193  -.034446  .170612         0
CCWorld1*|   .0579709      .03136    1.85   0.065  -.003492  .119434         0
CCWorld3*|   .0070662      .01794    0.39   0.694  -.028089  .042222         0
CCWorld4*|  -.0202825      .01805   -1.12   0.261  -.055662  .015097         0
  female*|  -.0411717      .00976   -4.22   0.000   -.06031 -.022033         0
gender~s*|  -.0704703      .03983   -1.77   0.077  -.148529  .007588         0
     age |  -.0008147      .00047   -1.75   0.080  -.001728  .000099     29.67
 Income0*|   .0077186      .02078    0.37   0.710  -.033019  .048456         0
 Income1*|    -.01322      .01772   -0.75   0.456  -.047953  .021513         0
```

```
 Income2*|  -.0014212      .01722   -0.08   0.934  -.035181  .032339         0
 Income3*|   .0178945       .0185    0.97   0.333  -.018365  .054154         0
 Income5*|    .028301      .02135    1.33   0.185  -.013543  .070145         0
 Income6*|  -.0254469      .01966   -1.29   0.195  -.063976  .013082         0
 Income7*|    .040258      .02381    1.69   0.091  -.006406  .086922         0
 Income8*|   .0822749      .02272    3.62   0.000   .037747  .126803         0
 Income9*|   .0330524      .02284    1.45   0.148  -.011722  .077826         0
Income~s*|   .0033156       .0252    0.13   0.895  -.046077  .052708         0
     ed0*|   .1373407      .03459    3.97   0.000   .069549  .205132         0
     ed1*|   .0078979      .01206    0.65   0.513  -.015737  .031533         0
     ed3*|   .0000401      .01102    0.00   0.997  -.021568  .021648         0
     ed4*|   .0255133      .05116    0.50   0.618  -.074758  .125785         0
     ed5*|   .0053987      .03178    0.17   0.865   -.05689  .067688         0
  edMiss*|   .0301019      .05068    0.59   0.553  -.069223  .129427         0
conserve*|  -.0361506      .00986   -3.66   0.000  -.055483 -.016818         0
conser~s*|  -.0144795      .02895   -0.50   0.617  -.071228  .042269         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Global Inequality for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)


. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(G_Inequal==7) (predict, p outcome(7))
         =  .26511036
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]       X
---------+--------------------------------------------------------------------
  Africa*|  -.0909152      .03357   -2.71   0.007  -.156707 -.025123         0
 Pacific*|  -.0331594      .02818   -1.18   0.239  -.088393  .022074         0
 LatinAm*|  -.0520179      .03663   -1.42   0.156  -.123807  .019771         0
 WestEur*|   -.018592      .03499   -0.53   0.595  -.087179  .049995         0
SouthEur*|  -.0540493      .05624   -0.96   0.337  -.164287  .056189         0
     USA*|  -.0542488      .02147   -2.53   0.012  -.096328  -.01217         0
  Canada*|  -.0271981      .01755   -1.55   0.121  -.061603  .007206         0
EastAsia*|  -.0738145      .05384   -1.37   0.170  -.179341  .031712         0
    Scan*|   .0121715      .03351    0.36   0.716  -.053502  .077845         0
 MidEast*|  -.1037933      .05058   -2.05   0.040  -.202929 -.004657         0
 EastEur*|   .0092609      .12859    0.07   0.943  -.242777  .261299         0
    pol0*|   .1655091      .02783    5.95   0.000    .11097  .220049         0
    pol1*|    .047776      .01961    2.44   0.015   .009333  .086219         0
    pol3*|  -.0577973      .02017   -2.87   0.004  -.097324 -.018271         0
    pol4*|  -.1745896      .02672   -6.53   0.000  -.226954 -.122225         0
 polMiss*|  -.0109968      .06531   -0.17   0.866  -.139006  .117012         0
  CCYou0*|  -.0277277      .05056   -0.55   0.583  -.126819  .071364         0
  CCYou1*|  -.0400202      .02717   -1.47   0.141  -.093278  .013238         0
  CCYou3*|   .0222636      .02415    0.92   0.357  -.025076  .069604         0
  CCYou4*|   .0466211       .0286    1.63   0.103   -.00943  .102673         0
CCYouM~s*|  -.0533818      .10125   -0.53   0.598  -.251832  .145069         0
CCWorld0*|  -.0846839      .05314   -1.59   0.111  -.188839  .019471         0
CCWorld1*|  -.0745942      .03632   -2.05   0.040  -.145781 -.003408         0
CCWorld3*|  -.0110256      .02826   -0.39   0.696  -.066405  .044354         0
CCWorld4*|   .0358484      .03129    1.15   0.252  -.025474  .097171         0
  female*|   .0812754      .01574    5.16   0.000   .050426  .112125         0
gender~s*|   .1683915      .13737    1.23   0.220  -.100842  .437625         0
     age |   .0013106      .00073    1.78   0.075   -.00013  .002751     29.67
 Income0*|  -.0120102      .03214   -0.37   0.709  -.075008  .050987         0
 Income1*|   .0225833      .03007    0.75   0.453   -.03635  .081517         0
 Income2*|   .0023005      .02786    0.08   0.934  -.052309   .05691         0
```

```
 Income3*|   -.026702      .02768   -0.96   0.335   -.08096  .027556         0
 Income5*|  -.0405401      .02999   -1.35   0.176  -.099318  .018237         0
 Income6*|   .0461556      .03639    1.27   0.205  -.025159  .117471         0
 Income7*|  -.0551445      .03124   -1.77   0.077  -.116364  .006075         0
 Income8*|  -.0977653      .02705   -3.61   0.000  -.150787 -.044744         0
 Income9*|  -.0464995      .03109   -1.50   0.135  -.107435  .014436         0
Income~s*|  -.0052569      .03968   -0.13   0.895  -.083026  .072512         0
     ed0*|  -.1390665      .02597   -5.36   0.000  -.189961 -.088172         0
     ed1*|    -.01228      .01842   -0.67   0.505  -.048384  .023824         0
     ed3*|  -.0000644      .01773   -0.00   0.997  -.034813  .034684         0
     ed4*|  -.0369422      .06704   -0.55   0.582  -.168331  .094447         0
     ed5*|  -.0084836      .04883   -0.17   0.862  -.104194  .087227         0
  edMiss*|   -.042824      .06356   -0.67   0.500  -.167397  .081749         0
conserve*|   .0693868      .01871    3.71   0.000   .032722  .106052         0
conser~s*|   .0248829        .053    0.47   0.639  -.079002  .128768         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

OutputAVI.8: Stata assisted OPM fit for: Time and associated marginal effects assuming the representative agent with reduced attitudinal explanatory categories. Marginal effects were calculated for all 8 η categories (y=0-7). Calculations for y=0 (η<0.5) and y=7 (η>7.5) are presented here as examples.

/*Reduced OPM specification for Time*/

```
. oprobit category3  Africa Pacific LatinAm WestEur SouthEur USA Canada EastAsia
      Scan MidEast EastEur pol0 pol1 pol3 pol4 polMiss CCYou0 CCYou1 CCYou3 CCYou4
      CCYouMiss CCWorld0 CCWorld1 CCWorld3 CCWorld4 CCWorldMiss female genderMiss
      age ageMiss Income0 Income1 Income2 Income3 Income5 Income6 Income7 Income8
      Income9 IncomeMiss ed0 ed1 ed3 ed4 ed5 edMiss conserve conserveMiss

note: CCWorldMiss dropped because of collinearity
note: ageMiss dropped because of collinearity
Iteration 0:   log likelihood = -2541.3737
Iteration 1:   log likelihood = -2497.3071
Iteration 2:   log likelihood = -2497.1598
Iteration 3:   log likelihood = -2497.1597

Ordered probit regression                       Number of obs   =       2441
                                                LR chi2(46)     =      88.43
                                                Prob > chi2     =     0.0002
Log likelihood = -2497.1597                     Pseudo R2       =     0.0174

------------------------------------------------------------------------------
   category3 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      Africa |  -.0793931   .1583536    -0.50   0.616    -.3897605    .2309743
     Pacific |   .0574996   .1138565     0.51   0.614    -.1656551    .2806542
     LatinAm |   .3028118   .1648334     1.84   0.066    -.0202557    .6258794
     WestEur |   .0354595   .1247423     0.28   0.776    -.2090309      .27995
    SouthEur |   .4159994   .2502229     1.66   0.096    -.0744284    .9064272
         USA |  -.1826605   .0829032    -2.20   0.028    -.3451477   -.0201733
      Canada |  -.0336387   .0678156    -0.50   0.620    -.1665548    .0992774
    EastAsia |   .2257964   .2449527     0.92   0.357     -.254302    .7058948
        Scan |    .179607   .1235588     1.45   0.146    -.0625638    .4217778
     MidEast |  -.0754355   .2479672    -0.30   0.761    -.5614422    .4105712
     EastEur |   .4048091   .4773792     0.85   0.396    -.5308369    1.340455
        pol0 |   .0014981    .086723     0.02   0.986    -.1684758     .171472
        pol1 |   .0223638   .0696157     0.32   0.748    -.1140804     .158808
        pol3 |   .0818384   .0787254     1.04   0.299    -.0724605    .2361374
        pol4 |  -.0123837   .1101309    -0.11   0.910    -.2282363    .2034689
     polMiss |   .5360877   .3119062     1.72   0.086    -.0752373    1.147413
      CCYou0 |  -.2233823   .2016095    -1.11   0.268    -.6185296     .171765
      CCYou1 |  -.2763563   .1051258    -2.63   0.009     -.482399   -.0703136
      CCYou3 |   -.071807   .0884184    -0.81   0.417    -.2451039      .10149
      CCYou4 |   .0533131   .1015271     0.53   0.600    -.1456763    .2523025
   CCYouMiss |  -.1035457    .477074    -0.22   0.828    -1.038594    .8315021
    CCWorld0 |   .3098935   .2422526     1.28   0.201    -.1649128    .7846999
    CCWorld1 |   .2103357   .1535465     1.37   0.171      -.09061    .5112813
    CCWorld3 |   .0421703   .1069849     0.39   0.693    -.1675161    .2518568
    CCWorld4 |   .0290815   .1142491     0.25   0.799    -.1948426    .2530056
      female |   .1906571   .0527795     3.61   0.000     .0872111    .2941031
  genderMiss |   .6329521   .4593885     1.38   0.168    -.2674328    1.533337
         age |   .0106065   .0028002     3.79   0.000     .0051182    .0160949
     Income0 |  -.3024396   .1193904    -2.53   0.011    -.5364404   -.0684388
     Income1 |  -.0704047   .1137211    -0.62   0.536     -.293294    .1524846
     Income2 |  -.0245576   .1077102    -0.23   0.820    -.2356657    .1865504
     Income3 |  -.0373886   .1094657    -0.34   0.733    -.2519374    .1771603
     Income5 |  -.2363099   .1173659    -2.01   0.044    -.4663429    -.006277
     Income6 |  -.1880694   .1289546    -1.46   0.145    -.4408157    .0646769
```

```
     Income7 |  -.1740468   .1236208    -1.41   0.159    -.4163391    .0682455
     Income8 |  -.1990119    .109778    -1.81   0.070    -.4141728     .016149
     Income9 |  -.2293428   .1217116    -1.88   0.060    -.4678931    .0092074
  IncomeMiss |  -.1066569   .1547789    -0.69   0.491     -.410018    .1967042
         ed0 |   .0431741   .1282145     0.34   0.736    -.2081217    .2944699
         ed1 |   .0232461   .0726607     0.32   0.749    -.1191663    .1656585
         ed3 |  -.1080042   .0653443    -1.65   0.098    -.2360767    .0200683
         ed4 |   .2434362   .2740642     0.89   0.374    -.2937197     .780592
         ed5 |  -.2596802   .1637935    -1.59   0.113    -.5807096    .0613492
      edMiss |    .513382   .3369116     1.52   0.128    -.1469527    1.173717
    conserve |  -.0374426   .0607584    -0.62   0.538    -.1565269    .0816417
conserveMiss |   -.055982   .1821314    -0.31   0.759    -.4129529     .300989
-------------+----------------------------------------------------------------
       /cut1 |  -1.469545   .1763593                     -1.815202   -1.123887
       /cut2 |  -1.345397   .1755173                     -1.689404   -1.001389
       /cut3 |   -1.19914   .1747026                     -1.541551   -.8567292
       /cut4 |  -.5730988   .1733127                     -.9127854   -.2334122
       /cut5 |  -.2321144   .1731643                     -.5715102    .1072815
------------------------------------------------------------------------------
```

/*Predicted Marginal Effects for Time for y=0 (η<0.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)

. mfx, predict(p outcome(0)) at(A)
```

```
Marginal effects after oprobit
      y  = Pr(category3==0) (predict, p outcome(0))
         =  .03719233
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|   .0069192      .01469    0.47   0.638  -.021867  .035705         0
 Pacific*|  -.0044357      .00858   -0.52   0.605  -.021243  .012372         0
 LatinAm*|  -.0187506      .00961   -1.95   0.051  -.037584  .000082         0
 WestEur*|  -.0027899      .00962   -0.29   0.772  -.021648  .016068         0
SouthEur*|  -.0232974      .01162   -2.01   0.045  -.046065 -.000529         0
     USA*|    .017432      .00968    1.80   0.072  -.001534  .036398         0
  Canada*|    .002815      .00571    0.49   0.622  -.008374  .014004         0
EastAsia*|  -.0149787      .01401   -1.07   0.285   -.04244  .012482         0
    Scan*|  -.0124184      .00841   -1.48   0.140  -.028895  .004058         0
 MidEast*|   .0065512      .02287    0.29   0.775  -.038281  .051383         0
 EastEur*|  -.0228957      .01875   -1.22   0.222  -.059653  .013862         0
    pol0*|  -.0001215      .00703   -0.02   0.986  -.013904  .013661         0
    pol1*|  -.0017803      .00559   -0.32   0.750  -.012739  .009178         0
    pol3*|  -.0061771      .00625   -0.99   0.323  -.018425  .006071         0
    pol4*|   .0010169      .00908    0.11   0.911   -.01678  .018814         0
 polMiss*|  -.0270308      .01223   -2.21   0.027  -.050999 -.003062         0
  CCYou0*|   .0220863      .02359    0.94   0.349  -.024155  .068328         0
  CCYou1*|   .0285998       .0134    2.13   0.033   .002341  .054859         0
  CCYou3*|   .0062161      .00785    0.79   0.428   -.00917  .021602         0
  CCYou4*|  -.0041282      .00783   -0.53   0.598  -.019482  .011226         0
CCYouM~s*|   .0092188      .04614    0.20   0.842  -.081216  .099654         0
CCWorld0*|  -.0190683      .01306   -1.46   0.144  -.044669  .006532         0
CCWorld1*|  -.0141477       .0104   -1.36   0.174  -.034539  .006244         0
CCWorld3*|  -.0032981      .00856   -0.39   0.700  -.020066   .01347         0
CCWorld4*|  -.0023012      .00911   -0.25   0.801  -.020153  .015551         0
  female*|  -.0130524      .00518   -2.52   0.012  -.023203 -.002901         0
gender~s*|   -.029372      .01378   -2.13   0.033  -.056385 -.002359         0
     age |  -.0008614      .00043   -2.02   0.043  -.001697 -.000026     29.67
 Income0*|   .0320044      .01491    2.15   0.032   .002787  .061221         0
 Income1*|   .0060872      .00992    0.61   0.540  -.013359  .025533         0
```

```
 Income2*|   .0020385      .00892    0.23   0.819   -.01545  .019527         0
 Income3*|   .0031392      .00918    0.34   0.733  -.014862  .021141         0
 Income5*|   .0236272       .0131    1.80   0.071  -.002043  .049297         0
 Income6*|    .018033      .01369    1.32   0.188  -.008797  .044863         0
 Income7*|   .0164855      .01255    1.31   0.189  -.008106  .041077         0
 Income8*|   .0192649      .01129    1.71   0.088  -.002862  .041392         0
 Income9*|   .0227929      .01356    1.68   0.093  -.003781  .049367         0
Income~s*|   .0095219      .01459    0.65   0.514  -.019066   .03811         0
     ed0*|  -.0033736      .00972   -0.35   0.729  -.022423  .015676         0
     ed1*|  -.0018491      .00575   -0.32   0.748  -.013126  .009427         0
     ed3*|   .0096537      .00657    1.47   0.141  -.003214  .022522         0
     ed4*|  -.0158957      .01508   -1.05   0.292  -.045445  .013653         0
     ed5*|   .0264921      .02139    1.24   0.215  -.015422  .068407         0
  edMiss*|  -.0264007      .01256   -2.10   0.036  -.051013 -.001788         0
conserve*|   .0031439      .00531    0.59   0.554  -.007261  .013548         0
conser~s*|   .0047786      .01635    0.29   0.770   -.02726  .036817         0
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

/*Predicted Marginal Effects for Time for y=7 (η>7.5)*/

```
/*specification of start values for the marginal effects to be evaluated.  Note all
       dummy variables are set to zero and age and household_members set to their
       mean values.*/
. mat A=(0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,29.67,2.95,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
> 0,0,0,0,0,0,0,0,0,0)
```

```
. mfx, predict(p outcome(7)) at(A)

Marginal effects after oprobit
      y  = Pr(category3==7) (predict, p outcome(7))
         =  .70774534
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.     z    P>|z|  [    95% C.I.   ]      X
---------+--------------------------------------------------------------------
  Africa*|  -.0278462      .05644   -0.49   0.622  -.138472   .08278         0
 Pacific*|   .0194357      .03809    0.51   0.610  -.055219  .094091         0
 LatinAm*|    .094487      .04753    1.99   0.047    .00133  .187644         0
 WestEur*|   .0120621      .04214    0.29   0.775  -.070527  .094652         0
SouthEur*|    .124433      .06491    1.92   0.055  -.002789  .251656         0
     USA*|  -.0656186      .03066   -2.14   0.032  -.125701 -.005536         0
  Canada*|  -.0116611      .02351   -0.50   0.620  -.057734  .034412         0
EastAsia*|    .072377      .07345    0.99   0.324  -.071577   .21633         0
    Scan*|   .0584631      .03898    1.50   0.134  -.017934  .134861         0
 MidEast*|   -.026432      .08835   -0.30   0.765  -.199596  .146732         0
 EastEur*|   .1216095      .12198    1.00   0.319  -.117459  .360678         0
    pol0*|   .0005145      .02978    0.02   0.986  -.057851   .05888         0
    pol1*|   .0076355      .02381    0.32   0.748  -.039039   .05431         0
    pol3*|    .027465      .02661    1.03   0.302  -.024689  .079619         0
    pol4*|  -.0042687      .03801   -0.11   0.911   -.07876  .070223         0
 polMiss*|   .1528277      .07255    2.11   0.035   .010625  .295031         0
  CCYou0*|   -.080931      .07568   -1.07   0.285  -.229256  .067394         0
  CCYou1*|   -.101151      .03911   -2.59   0.010  -.177807 -.024495         0
  CCYou3*|  -.0251378      .03102   -0.81   0.418  -.085942  .035667         0
  CCYou4*|   .0180425      .03423    0.53   0.598  -.049041  .085126         0
CCYouM~s*|  -.0365327      .17222   -0.21   0.832  -.374086   .30102         0
CCWorld0*|   .0964503      .06952    1.39   0.165    -.0398    .2327         0
CCWorld1*|   .0677733      .04845    1.40   0.162  -.027186  .162732         0
CCWorld3*|   .0143174      .03654    0.39   0.695  -.057293  .085928         0
CCWorld4*|   .0099104      .03901    0.25   0.799  -.066539  .086359         0
  female*|   .0618355      .01798    3.44   0.001   .026599  .097072         0
gender~s*|   .1732072      .09466    1.83   0.067  -.012322  .358737         0
     age |   .0036438      .00096    3.79   0.000   .001758  .005529     29.67
 Income0*|  -.1112173      .04416   -2.52   0.012  -.197767 -.024668         0
 Income1*|  -.0246382      .03978   -0.62   0.536  -.102604  .053328         0
 Income2*|  -.0084927      .03721   -0.23   0.819  -.081426   .06444         0
```

Income3*|	-.0129738	.03794	-0.34	0.732	-.087337	.061389	0
Income5*|	-.0858357	.04278	-2.01	0.045	-.16968	-.001992	0
Income6*|	-.0676399	.04698	-1.44	0.150	-.159726	.024446	0
Income7*|	-.0624077	.04454	-1.40	0.161	-.149714	.024898	0
Income8*|	-.0717413	.03937	-1.82	0.068	-.148896	.005414	0
Income9*|	-.0831899	.0445	-1.87	0.062	-.17041	.00403	0
Income~s*|	-.0376585	.05528	-0.68	0.496	-.145997	.07068	0
ed0*|	.014654	.04305	0.34	0.734	-.069724	.099032	0
ed1*|	.0079348	.02474	0.32	0.748	-.040556	.056425	0
ed3*|	-.0381465	.02345	-1.63	0.104	-.084105	.007812	0
ed4*|	.0775626	.08097	0.96	0.338	-.081133	.236259	0
ed5*|	-.0947518	.06284	-1.51	0.132	-.217924	.028421	0
edMiss*|	.147726	.07836	1.89	0.059	-.00585	.301302	0
conserve*|	-.0129927	.02127	-0.61	0.541	-.054685	.028699	0
conser~s*|	-.0195194	.06441	-0.30	0.762	-.145754	.106715	0

(*) dy/dx is for discrete change of dummy variable from 0 to 1