Economic Choices and Status: Measuring Preferences for Income Rank*

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Abstract

We report on the trade-offs that 1,068 Australian university students make between absolute income and the rank of that income in hypothetical income distributions. We find that income rank matters independently of absolute income, with greater weight given to rank by males, migrants, and individuals from wealthy families. Rank-sensitive individuals require as much as a 200 per cent increase in income to be compensated for going from the top to the bottom of the income distribution. Migrants residing abroad for longer periods of time, and with more affluent job titles, are more likely to compare themselves to others at the destination. A dynamic choice model of compensating incomes predicts the average respondent to need a permanent increase in income of up to \$10,000 (70 per cent) when moving from a society with a mean income of \$14,000 (e.g. Mexico) to a society with a mean income of \$46,000 (e.g. the USA).

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1 Introduction

Status-seeking behaviour is observed in many settings. Whether it be within the family home, school classroom, workplace, local neighbourhood, the discotheque or prison ground, individuals continually compare themselves to others. Economists have formally captured this idea via the concept of relative utility.[1] Perhaps, the most prominent example of relative utility at play is Richard Easterlin's seminal article (1974) which rationalised the lack of an empirical relation between aggregate happiness and aggregate income by appealing to the notion that people's utility depends on relative income rather than the level of income.[2] This finding has attracted renewed interest in the link between economic choices and social status. Active researchers have proposed status concerns to be able to explain several economic phenomena, including the equity-premium puzzle (Constantinides 1990, Gali 1994); stable labour supply in the face of rising incomes (Neumark and Postlewaite 1998); upward rather than downward sloping wage profiles (Frank and Hutchens 1993, Loewenstein and Sicherman 1991); the feeling of poverty (Sen 1983); the demand for risky activities (Becker *et al.* 2005); and migration choices (Stark and Taylor 1991), where someone who is the 'king of a small hill' is unlikely to want to move to the 'foot of a big hill'.[3] The notion that utility is a function of status, or 'relative' income, entails important consequences for policy design. At the extreme, economic growth becomes no longer important and the progressive taxation of status-seeking is the policymaker's primary obsession (Boskin and Sheshinski 1978, Frank 1985, Layard 1980, 2005).

In the present paper, we consider three questions of empirical nature: First, what is the trade-off between income rank and absolute income in stated-preference choice situations? Second, how long does it take for individuals migrating between societies to begin comparing themselves to the income distribution at the destination, and what does this imply for the trade-off above? Finally, does rank explain choices better than other common measures of relative income? We look at these questions with a sample of 1,068 university students from Australia. Our focus on income rank is partially motivated by recent work that finds income rank to be a variable of importance for work effort (Clark

[1] See, for example, Friedman and Savage (1948), Duesenberry (1949), Pollak (1976), Kapteyn (1977), Frank (1985), Robson (1992), Hopkins and Kornienko (2004), and Becker *et al.* (2005).

[2] A more recent study by Stevenson and Wolfers (2008) re-examines the Easterlin Paradox using a richer set of data. The authors point out a more limited role for relative (income) preferences in determining life satisfaction. In a follow-up study, Kruger (2008) questions the robustness and statistical relationship between income growth and mean happiness levels found within the sampled countries, once again giving support to the Easterlin Paradox.

[3] For a recent survey of the literature on relative utility, see Clark *et al.* (2008).

et al. 2010), job satisfaction (Brown *et al.* 2008), and neighbourhood choice (Clark *et al.* 2009).[4]

Most econometric studies focusing on the importance of 'absolute' versus 'relative' income use survey data on reported life satisfaction, or happiness, as a proxy measure for individual utility, and proceed to estimate the relative size of the coefficients on absolute income and some form of relative income (within a 'happiness regression'). An alternative approach to measuring relative preferences takes the form of a choice experiment, whereby individual respondents are asked to make choices between two, or more, hypothetical alternatives, often labelled as 'societies'. These hypothetical societies are characterized by different bundles of absolute and relative income. Respondents then record or state their preferences over alternatives, allowing the researcher to estimate the underlying taste parameters (see Clark *et al.* 2008).

The main advantage of using a hypothetical choice experiment is that it allows the researcher to isolate all non-income factors from a choice situation. Solnick and Hemenway (1998), Johanssson-Stenman *et al.* (2002), Alpizar *et al.* (2005), Andersson (2008), and Carlsson *et al.* (2007, 2009) appeal to this idea, and present respondents with imaginary societies which differ in both the absolute and relative income (consumption) domains.[5] Their results indicate that individuals are willing to exchange absolute income for higher relative income, with the two measures being of similar importance. Choice experiments from these studies share four common features: (i) participants are university students, (ii) the survey design is of written questionnaire format, (iii) relative income is given in the form of own income divided by the average income in the reference group, and (iv) an entire society forms a reference group. Solnick and Hemenway (1998), Andersson (2008), and Carlsson *et al.* (2007) are exceptions to (i). In the two former studies, university staff members form a part of the sample, providing greater socioeconomic variation among subjects. Carlsson *et al.* (2007) manage to successfully capture a random sample of the general population by mailing out their questionnaire to residents of Sweden. A departure from features (ii) and (iv) is realised in Carlsson *et al.* (2009). The study introduces a hypothetical setup of the caste system in India, where a more compact reference group is formed by including a measure of relative standing within one's own cast, in addition to one's society. The authors also employ a graphical (bar chart) representation of the

[4]The importance of rank order for human behaviour has long been recognised by biologists and social scientists, see e.g. Parducci (1963), Layard (1980), Frank (1985), Mayer (1997), Postlewaite (1998), and the references therein.

[5]An excellent review of earlier studies is Solnick and Hemenway (1998).

choice situations, deviating somewhat from feature (ii).

We contribute to this literature by strictly deviating from features (ii) and (iii). We introduce a survey instrument of pure graphical construct, where hypothetical societies are described by discrete distributions of income. Similar to earlier studies, we alter the combination of income and status available in each society, and ask respondents to state their preferences. Our approach brings about several advantages. For participants, the task at hand becomes more clear as each choice situation is simple to understand and relate to. At the same time, a graphical construct facilitates the simultaneous inclusion of various forms of relative income in addition to the widely used ratio comparison income (feature (iii)). Thereby, our study does not frame the choice situation in terms of absolute level versus rank order, but rather allows the respondent to decide on what is important about the choice situation.

As a survey instrument, vignettes have the advantage of being able to elicit preference parameters where real-world data is fraught with interpretation difficulties due to unmeasured aspects of the choice situation. This is particularly true with location or migration choices, where, among other factors, unmeasured social networks, political opinions, religious motivations and perceptions of future employment prospects are all important variables in actual decisions, however are imperfectly observed by the researcher. By using vignettes of hypothetical income distributions, we can hope to at least attain a reasonable understanding of the preferences relating to income.

Some of the known disadvantages of vignettes are relatively unimportant in the case of hypothetical migration to societies or countries labelled 'A' and 'B'. Firstly, no actual money is exchanged. Secondly, among our subjects (college students) the hypothetical choice is one they are quite familiar with as about one-third of the sample are migrants, and the rest of the subjects are likely to know migrants in their vicinity (Australia has some of the highest migration rates within the Anglo-Saxon world). Finally, relative concerns are quite common for students as they compete in sports, on the dating or marriage market, and are continuously assessed relative to their peers via academic examinations. A close analogy is to ask respondents about their political preferences. The latter type of questionnaire is similarly 'familiar' and yields high response rates with relatively low rates of systematic bias (see, for example, Klor and Shayo 2010). Despite the above, our study nevertheless exhibits the more general shortcomings arising in hypothetical choice experiments (see Bertrand and Mullainathan 2001). The shortcomings of particular concern in the present study are discussed in more detail below.

The collected survey data allow us to estimate a rich preference specification and also contains unique information on migrant reference groups. We consider the reference group, i.e. the income distribution an individual relates to, as being endogenous and proceed to obtain explicit measures of the amount of time migrants require to substitute the income distribution in the home society for the one at the destination. We incorporate this information into a dynamic choice problem, and estimate the compensating income needed to offset a migrant's loss of status. Overall, in addition to providing new insights into the three questions posed, our study makes data and methodological contributions to the literature on relative preferences.

The rest of the paper is organised as follows. Section 2 outlines the theoretical background. Section 3 describes the choice experiment. Section 4 follows with the descriptive results. Section 5 contains the econometric analysis, where we estimate preference parameters for income rank and absolute income; study migrant reference groups; and calculate compensating incomes for loss of status. Section 6 focuses on the most predictive form of relative income. The final section summarises the main findings and concludes.

2 Theoretical Background

Following Frank (1985), Robson (1992), Hopkins and Kornienko (2004), and Becker *et al.* (2005), we define an individual's status (or relative income) by her rank in the distribution of income. This income rank is usually captured by $R(Y_i) \in [0,1]$, where $R(Y)$ denotes a cumulative density function of income. We consider a utility function of the form:

$$U_i = U\left\langle Y_i, R(Y_i)\right\rangle = a_i Y_i + b_i R_i \tag{1}$$

where Y_i is individual $i's$ absolute level of income, $a_i > 0$ is the corresponding utility weight on Y_i, and R_i represents the ordinal rank of income Y_i. Our main interest is in estimating the utility weight on income rank $0 \leq b_i \leq \infty$. In the case of $b_i = 0$, we revert to the neoclassical assumption where utility depends solely upon absolute income. On the other hand, $\frac{b_i}{a_i} \to \infty$, corresponds to the case where utility is purely a relative concept (dependent on rank order). In the empirical application, b_i is specified as a linear function of a vector of individual characteristics, and the income distribution against which an individual calculates her rank R_i is also endogenous.

In addition to the arguments in utility function (1), we consider other popular measures of relative income, namely: ratio comparison income, $Y_i/\overline{Y}$, and difference comparison income, $Y_i - \overline{Y}$, where individuals are assumed to compare themselves to the average in

society; see, for example, Akerlof (1997), Corneo and Jeanne (1997), Ljungqvist and Uhlig (2000), Bowles and Park (2005), Carlsson *et al.* (2007), and Aronsson and Johansson-Stenman (2008, 2010). The notion of relative deprivation, defined as the proportion of individuals in $i's$ reference group who are richer than i, weighted by their mean excess income (Yitzhaki 1979), is also examined. We define these measures more formally in Section 6.

3 The Choice Experiment

Employing a graphical stated preference approach, we present respondents with 11 hypothetical choice situations. In each choice situation, respondents are asked to make a choice between two hypothetical countries or societies, A and B. Each society is characterised by an income distribution, made up of 9 hypothetical income earners. These individuals form a reference group. Of the nine individuals, one is pre-selected (highlighted) to represent the imagined respondent. This approach deviates somewhat from existing studies where respondents are made to represent a future relative, such as a grandchild. The idea in those studies being to isolate choice making from any pending life shocks. Although intuitive, it can nevertheless be argued that such a representation draws the decision maker further away from reality. This comes about as survey respondents are made to consider a 'two-dimensional' hypothetical; (i) making hypothetical choices, and (ii) doing so, on behalf of someone who is yet to, or never may, exist. Furthermore, as respondents have quite limited information about the preferences of their imaginary grandchild, they are bound to express their own. A potential drawback of our approach is that people may consider positional or status concerns to be a characteristic not to be proud of, and hence underestimate their own status preferences (see Johansson-Stenman and Martinsson 2006).

The survey consists of two parts. Part A asks respondents a set of socioeconomic questions. A subset of these examines actual reference groups. Part B of the survey contains the 11 choice situations. At the beginning of each session, participants are given verbal information and instructions about the study. Detailed information about the research question(s) is withheld until all responses are complete. By not promoting the general research question (*'Does relative standing matter?'*), we avoid placing any pressure on participants to make the study a success (or a failure). We simply allow participants to realise the concept independently.

Before recording their preferences, survey respondents read the following instructions:

*The following 11 questions ask you to select **ONE** from two possible options. Based on your preferences, please indicate (by circling either the illustrated individual marked ⇓ in **Country A**, or the individual marked in **Country B**) in which **'Country'** you would prefer to be in, excluding all other factors. The annual after-tax income/salary of each individual (measured in Australian dollars) is displayed directly below the illustrated individual. In the two countries, the cost of living is identical.*

We next illustrate the constructed choice situations. In choice situations 1 to 6, we study choices between *absolute income* and *income rank*. Choice situations 7, 8 and 9, evaluate choices between alternative forms of relative income. There, we examine whether individuals maximise *income rank* or comparisons with average income, such as *difference comparison income* and *ratio comparison income*. Similarly, the last two choice situations (10 and 11) focus on the trade-off between *income rank* and *relative deprivation*.

3.1 Choice Situations 1 to 6

In choice situation 1 (Figure 1), the respondent is asked to select between the highlighted income earner in society A (top panel) and the highlighted income earner in society B (bottom panel). Income levels in society A are discretely distributed between \$10,000 and \$90,000. The imagined respondent earns an income of \$70,000 in society A, and is ranked 3rd from the top. In society B, the highest income earner attains \$40,000 and an income rank of 1. This corresponds to the imagined respondent. The lowest income level in society B is \$500. Overall, the respondent faces a choice between a higher absolute level of income (society A) or a higher ordinal rank of income (society B). Are individuals willing to forgo \$30,000 for 'top-dog' status?

In Figure 2, we present a sample of other choice situations that the subjects also faced, however in slightly revised form due to length limitations. The drawn individuals ('stick figures') are now replaced with 'points', where the shaded points indicate the imagined respondent.[6] In choice situation 2 (Figure 2a), we focus on the lower end of the income same distributions as in choice situation 1. The choice of society A results in own income of \$10,000 and an income rank of 9, i.e. last place. On the other hand, the choice of society B entails higher status (income rank of 7), however a lower level of income (\$2,500). By choosing society B, individuals forgo \$7,500 and climb 2 ranks up from the

[6]For the original version of the choice scenarios, see the longer working paper version of this paper; Mujcic and Frijters (2010).

bottom of society. Similarly, in choice situation 3, we focus on the middle parts of the income distributions (see Appendix A1).

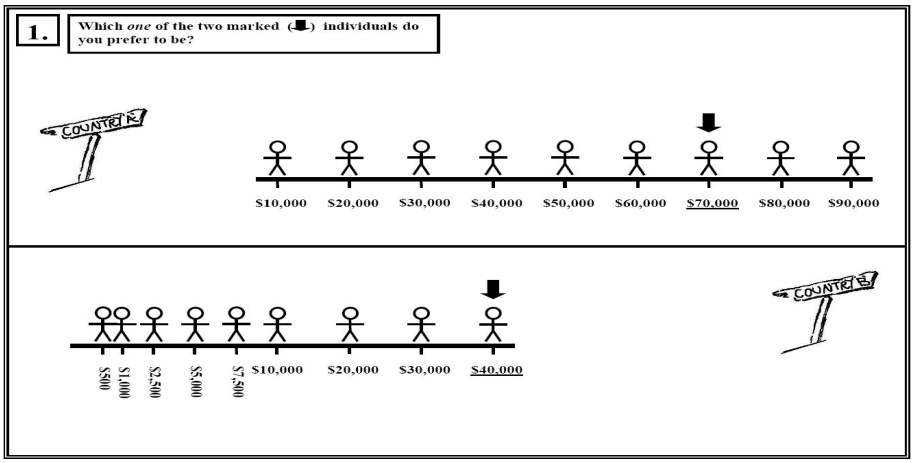


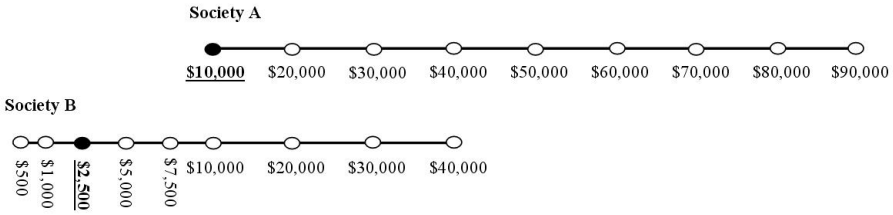
FIG. 1: Choice Situation 1 (Income Rank vs. Absolute Income)

In choice situations 4, 5 and 6, the income gap between the two hypothetical societies is reduced. The income distribution in society A is left unchanged, while that of society B is shifted to the right. The difference between the top incomes is now $15,000, and similar type of trade-offs as above are in place (see, for example, Figure 2b).[7]

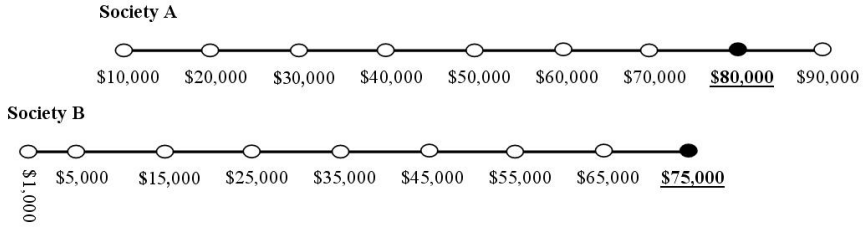
3.2 Choice Situations 7, 8 and 9

Choice situations 7, 8 and 9 examine choices between income rank and comparisons with average income. Here, the latter measure, along with absolute income, is held constant across the two imaginary societies, while income rank is varied. The intuition is as follows: if income rank is of no importance, conditional on absolute income and all comparisons with average income, we should realise a uniform choice distribution. That is, in a large sample, we would expect an approximate fifty per cent chance of either society being selected (i.e. a lottery). On the other hand, if people only care about rank, then each respondent should prefer society B. And, in the case where, for example, 20 per cent of

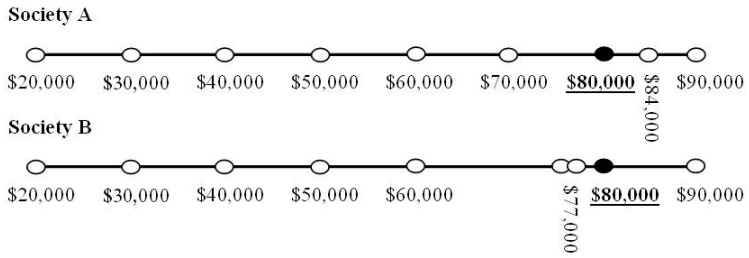
[7]It should be noted that choice situations 1 to 6 are subject to some criticism. Since we present entire distributions of income, survey respondents could potentially be maximising a range of relative income measures, or even measures of inequality. This comes about as none of the relative income measures are held constant across societies. Table 2 contains the actual values of these variables. For instance, in choice situations 1, 4 and 6, society A presents a higher level of absolute income, while society B offers a bundle of more favourable positional measures (i.e. income rank, difference and ratio comparison income, and relative deprivation). Which of the latter measures is being maximised? To determine this, we set up an econometric 'beauty contest' between the different attributes of these distributions (see Section 6).



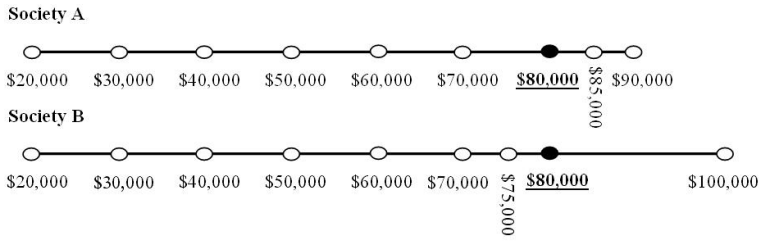
(a) Choice Situation 2 (Income Rank vs. Absolute Income)



(b) Choice Situation 4 (Income Rank vs. Absolute Income)



(c) Choice Situation 7 (Income Rank vs. Avg Income Comparisons)



(d) Choice Situation 10 (Income Rank vs. Relative Deprivation)

FIG. 2: Choice Situations 2, 4, 7 and 10

individuals care about income rank, and 80 per cent are indifferent, the distribution of responses is expected to approximate 60 per cent (B) and 40 per cent (A). Figure 2(c) illustrates choice situation 7. An income rank of 3 is obtained in society A, and a rank of 2 (second best) in society B. Representations of choice situations 8 and 9, where we study the bottom and middle parts of the income distribution, are contained in Appendix A1.

3.3 Choice Situations 10 and 11

In the final two choice situations (cs 10 and 11), we study preferences for income rank and relative deprivation. To obtain a clear result, we keep absolute income and all comparisons to average income fixed, and offer respondents a more favourable level of only one attribute in each society. In choice situation 10 (Figure 2d), society A offers a lower (higher) level of relative deprivation (satisfaction) and a lower income rank, relative to society B. Hence, a 'rank maximiser' would prefer society B, while a 'rd minimiser' would favour society A. In choice situation 11, the same trade-off is in place for individuals residing at the bottom end of the income distribution (see Appendix A1).

In the version of the survey presented above, society B (the bottom panel) may be labelled as 'status-seeker paradise', offering a higher level of status in each choice situation. To minimise potential ordering or systematic choice effects, a second version of the survey was distributed to roughly half (455) of the participants. This was a randomised copy of the one presented above, where we altered the order of choice situations and randomly assigned the 'country/society' with the more favourable income rank (to the top (A) and bottom (B) panels).[8]

4 Descriptive Results

Our sample consists of $1,068$ students from the Faculty of Business at the Queensland University of Technology in Brisbane, Australia. The respondents, being university students, were on average young, single, low-income earners from wealthy families (see Table 1). About one-third (315) of the respondents had migrated to Australia from another country. Studying migrants is of interest to us since these individuals may have already experienced, or are likely to experience, similar choice situations in real-life. We split the sample into two groups, migrants and non-migrants, and find that respondents from the former are on average more educated, earn higher incomes, and come from less wealthier

[8]The second (randomised) version of the survey can be found in the longer working paper version of this paper, see Mujcic and Frijters (2010).

families.[9] In addition, we capture interesting information about reference groups. Two-thirds of the migrants compared themselves, in terms of income level, to family members, friends and colleagues from the destination country (Australia), giving support to reference group substitution.

Table 2 presents response frequencies for each choice situation (grouped by similarity in response distributions).[10] In general, individuals do care about income rank. Of the 11,748 total choices made, 44 per cent (5,169) correspond to the society offering a higher income rank. This result is consistent with earlier studies, such as Solnick and Hemenway (1998), where about 50 per cent of the respondents selected the society with a more favourable relative income. Responses for the first three choice situations suggest that individuals are willing to pay a non-trivial premium for a higher income rank. As expected, being in last place alters choice behaviour with 42 per cent of the respondents avoiding society A in choice situation 2. This result is consistent with a recent study on last-place aversion (Kuziemko *et al.* 2011), where individuals occupying the lowest rank are found to possess a high propensity to choose a gamble instead of a risk-free payment of equivalent expected value in order to move from the bottom of society. The proportion of status-seekers broadly increases when we reduce the price of status (cs 4, 5 and 6). Based on total responses, income rank does not seem to outperform any relative comparisons to the average, such as difference comparison income and ratio comparison income. This is somewhat apparent in choice situations 7 and 9, where only 60 per cent of respondents selected the society with a higher income rank. The same general conclusion applies to choice situation 8, where a 50:50 response distribution is observed. In the case of income rank versus relative deprivation (cs 10 and 11), the former measure seems to matter most for low-income individuals (cs 11). These results, describing the average respondent, lend support to the importance of rank order in society and at the same time indicate preference heterogeneity among subjects, which we explore next.

[9] See Tables 7 and 8 in Appendix A3 of Mujcic and Frijters (2010) for more descriptives. The student sample was relatively heterogeneous due to the presence of mature-aged students surveyed in MBA classes.

[10] We find no significant differences (at the 5% level) between sample proportions for the choice situations across the two versions of the survey, suggesting the absence of any ordering or systematic choice effects. Hence, we proceed by combining/pooling responses from the two surveys.

Table 1: Variable Definitions and Summary Statistics

Variable	Description	Mean	Std
Age	Years of age	22.48	5.91
Gender	= 1 if male	0.46	0.50
Partner	= 1 if have partner	0.29	0.45
Yrs of education		12.66	1.07
	= 12 if completed high school 13 if graduate certificate/diploma 15 if university degree		
Employed	= 1 if employed	0.70	0.46
Job title		1.12	1.00
	= 1 if low skilled (e.g. cashier) 2 if junior/associate professional (e.g. graduate engineer) 3 if professional (e.g. senior engineer)		
Income	Disposable annual income from all sources ('000 AUD)	32.10	23.38
Family wealth	Perceived family wealth relative to average Australian family	3.35	0.87
	= 1 if much poorer 2 if somewhat poor 3 if as rich 4 if slightly richer 5 if much richer		
Migrant	= 1 if migrated to Australia	0.29	0.46
Yrs in Australia (A)	Number of years since arrival to Australia	5.61	5.44
In contact Home (H)	= 1 if in contact with friends/work colleagues from Home	0.89	0.32
Friends in Australia	= 1 if formed new friends/work colleagues in Australia	0.97	0.16
Contact, A vs H	= 1 if more in contact with colleagues in Australia	0.71	0.45
Reference group, A vs H	= 1 if reference group in Australia	0.66	0.47

TABLE 2: ATTRIBUTES OF SOCIETIES AND RESPONSE FREQUENCIES

CS	Society	R_i	Y_i	$\overline{Y}$	$Y_i - \overline{Y}$	$Y_i/\overline{Y}$	RD_i	$\widehat{p}(Society)$
1	A	3	70,000	50,000	20,000	1.40	3,333	**0.78**
	B	1	40,000	12,944	27,056	3.09	0	**0.22**
3	A	6	40,000	50,000	−10,000	0.80	16,666	**0.74**
	B	4	10,000	12,944	−2,944	0.77	6,666	**0.26**
2	A	9	10,000	50,000	−40,000	0.20	40,000	**0.58**
	B	7	2,500	12,944	−10,444	0.19	10,830	**0.42**
4	A	2	80,000	50,000	30,000	1.60	1,111	**0.61**
	B	1	75,000	35,667	39,333	2.10	0	**0.39**
5	A	9	10,000	50,000	−40,000	0.20	40,000	**0.62**
	B	8	5,000	35,667	−30,667	0.14	31,111	**0.38**
6	A	5	50,000	50,000	0	1.00	11,111	**0.64**
	B	4	45,000	35,667	9,333	1.26	6,666	**0.36**
7	A	3	80,000	58,222	21,778	1.37	1,550	**0.39**
	B	2	80,000	58,222	21,778	1.37	1,111	**0.61**
9	A	5	60,000	56,000	4,000	1.07	7,111	**0.38**
	B	4	60,000	56,000	4,000	1.07	6,666	**0.62**
11	A	8	30,000	52,778	−22,778	0.57	23,777	**0.39**
	B	7	30,000	52,778	−22,778	0.57	24,444	**0.61**
8	A	8	30,000	52,667	−22,667	0.57	23,777	**0.51**
	B	7	30,000	52,667	−22,667	0.57	23,333	**0.49**
10	A	3	80,000	58,333	21,667	1.37	1,666	**0.51**
	B	2	80,000	58,333	21,667	1.37	2,222	**0.49**

NOTE: *Income Rank* (R_i) is defined as the ordinal rank of own income out of 9, where 1 = highest (best) and 9 = lowest (worst). Y_i is *Absolute Income*, column (4). $\overline{Y}$ is the *Average Income in Society*, column (5). *Difference Comparison Income* ($Y_i - \overline{Y}$) is calculated by subtracting column (5) from column (4). *Ratio Comparison Income* ($Y_i/\overline{Y}$) is calculated by dividing column (4) by column (5). *Relative Deprivation* (RD_i) is the proportion of individuals who are richer than the imagined respondent, weighted by their mean excess income. The last column $\widehat{p}(Society)$ is the proportion of respondents choosing each society.

5 Econometric Analysis

5.1 Parameter Estimates

In estimating utility function (1), we consider a random utility model of the form

$$U_{it}^{s} = V(A_t^s, X_i) + \epsilon_{it}^{s} = aY_t^s + bR_t^s + cX_i + \epsilon_{it}^{s} \tag{2}$$

where U_{it}^{s} is the utility individual i derives from society $s = A, B$ in choice situation $t = 1, 2, ...11$. The observed portion of utility, V_{it}^{s}, is assumed to be a linear-in-parameters function of the vector of choice attributes, $A_t^s = \langle Y_t^s, R_t^s \rangle$, and a vector of individual characteristics, X_i. The unobserved portion of utility, ϵ_{it}^{s}, is included to capture any outside concepts that are brought into the choice experiment by the respondent. These include, for example, inattention by the respondent to the task, pure randomness in the respondent's choices, or other quixotic aspects of the stated-preference choices (see Train 2003, Train and Wilson 2008). Furthermore, preferences for absolute income and income rank are bound to differ across socioeconomic groups. To account for this heterogeneity, we specify the preference parameters, a and b, as linear functions of the elements of X_i. For example, $b = k + dMale_i + gMigrant_i + hWealth_i$, where d, g, and h are the interaction effects of interest.

The probability that respondent i chooses society B in choice situation t is

$$\begin{aligned} P_{it}^{B} &= \text{Prob}\left[U_{it}^{B} > U_{it}^{A}\right] \\ &= \text{Prob}\left[\epsilon_{it}^{A} - \epsilon_{it}^{B} < V_{it}^{B} - V_{it}^{A}\right] \\ &= \text{Prob}\left[\widetilde{\epsilon}_{it} < a(Y_{it}^{B} - Y_{it}^{A}) + b(R_{it}^{B} - R_{it}^{A})\right] \end{aligned} \tag{3}$$

We estimate a and b using a repeated binary probit model, where $\widetilde{\epsilon}_{it} \sim N(0, 1)$.[11] Table 3 reports the maximum likelihood results for different model specifications.[12] The taste parameter estimates reflect *beta coefficients* as the choice attributes, absolute income and income rank, are in standardised form. Similarly, socioeconomic characteristics such as

[11] To simplify interpretation of the results, we redefine *Income Rank* as '10 - ordinal income rank' (from Table 2). That is, from here on, the *top* ranked individual (ordinal rank of 1) has an income rank of 9, and the *bottom* ranked individual attains an income rank of 1.

[12] A log-linear utility specification was also estimated. However, the fit of the model, based on the value of the likelihood function, was significantly lower (hence, we do not report the results). At the same time, replacing income rank with other positional measures, such as difference comparison income $(Y_i - \overline{Y})$ and ratio comparison income $(Y_i/\overline{Y})$, results in substantially different parameter estimates and sometimes theoretically implausible values. This could well stem from the strong recorded collinearity between absolute income and the average income comparison measures. These status measures were not made as explicit to respondents as the rank measure.

age, years of education, income and family wealth level have been rescaled into z-scores, allowing us to make inferences about the relative magnitude of preferences.[13]

TABLE 3: PREFERENCE PARAMETER ESTIMATES FOR ABSOLUTE INCOME AND INCOME RANK

Model Specification:	(1)	(2)	(3)	(4)
Attribute	Coefficient Est	Coefficient Est	Coefficient Est	Coefficient Est
Abs Income	**0.811** (0.00)	**0.798** (0.00)	**0.734** (0.00)	**0.706** (0.00)
Income Rank	**0.125** (0.00)	−0.002 (0.97)	0.028 (0.72)	0.014 (0.86)
Interaction Term				
Age × Abs Income			−0.051 (0.28)	−0.007 (0.90)
Age × Income Rank			0.028 (0.50)	0.055 (0.25)
Male × Abs Income		0.049 (0.55)	0.059 (0.46)	0.067 (0.41)
Male × Income Rank		**0.158** (0.03)	**0.151** (0.03)	**0.155** (0.03)
Partner × Abs Income			0.132 (0.19)	0.150 (0.14)
Partner × Income Rank			−0.137 (0.12)	−0.129 (0.14)
Educ × Abs Income				−0.078 (0.10)
Educ × Income Rank				−0.074 (0.08)
Job Title × Abs Income			0.018 (0.69)	0.024 (0.59)
Job Title × Income Rank			0.016 (0.75)	0.013 (0.75)
Income × Abs Income				−0.026 (0.58)
Income × Income Rank				0.012 (0.78)
Family Wealth × Abs Income		0.070 (0.08)	0.066 (0.10)	0.065 (0.11)
Family Wealth × Income Rank		**0.115** (0.00)	**0.116** (0.00)	**0.114** (0.00)
Migrant × Abs Income		−0.022 (0.81)	−0.004 (0.96)	0.036 (0.69)
Migrant × Income Rank		**0.186** (0.02)	**0.186** (0.02)	**0.219** (0.01)
Number of observations:	11,748	11,748	11,748	11,748
Log-likelihood:	−7757.4	−7740.5	−7732.0	−7729.5

NOTE: Abs Income, Income Rank, Age, Educ, Income and Family Wealth are in standardised form. Models estimated using responses for choice situations 1 to 12. P-values in parentheses. Bold denotes statistical significance at least at the 5% level.

Income rank does matter for choice behaviour, however to a smaller degree than absolute income. Consider first the estimates from model (2). There, a rank-sensitive individual (male, migrant, from a wealthy family) values absolute income twice as much as income rank ($a = 0.9$, $b = 0.46$). On the other hand, for the reference individual (female, non-migrant, of average wealth) income rank plays no part in determining choices, and absolute income is of sole importance ($a = 0.8$, $b = 0$). The latter individual (and tastes) also characterises the average female respondent from our sample.

[13] As we are only interested in the relative magnitude and direction of the preference parameters (a and b) in the random utility model, i.e. the marginal utility of choice attributes, we only report the (raw) coefficient estimates (in Table 3), and not the marginal effects. For a recent discussion on different approaches to analysing interaction effects of variables in non-linear models; see, for example, Ai and Norton (2004) and Greene (2010).

In a more general specification, such as model (3), the relative taste parameter ratios (a/b) are: 1.15 for a young rank-sensitive individual, and 18.08 for the average female respondent, with the former agent having similar preferences for absolute income and status, and the latter being purely interested in her absolute material welfare.[14]

Estimates of the interaction effects suggest that income rank becomes more important as family wealth rises. This is consistent with Veblen's (1899) theory of conspicuous consumption and leisure, where the author describes the rich as primarily engaging in activities that display their status such as via the purchase of luxurious homes or spending time on activities that have no productive purpose, as opposed to poor individuals who have to spend more time on productive activities.[15]

The coefficient for the interaction between males and income rank is positive and statistically significant indicating that the males in our sample care more about rank than females. This finding is in line with the arguments of Frank (1999), who explains the tendency in males to seek status as possibly having evolved from the once popular practise of polygamous marriage arrangements, whereby highest ranked males had the greatest number of offspring. However, our finding contradicts that by Johanssson-Stenman *et al.* (2002) and Alpizar *et al.* (2005), who find females to be more status oriented. Nonetheless, the result is supported by Carlsson *et al.* (2009).

A notable difference in tastes for social rank is also apparent between migrant and non-migrant groups. That is, people who arrived to Australia from another country seem to possess stronger concerns for income rank than the natives at the destination. This finding requires careful interpretation as one is tempted to form conclusions about migratory behaviour: The coefficient for the interaction between migrants and income rank is driven by a comparison between university students in Brisbane who are members of an immigrant family and those students who come from a native family. Thus, the comparison made is not between migrants and those persons from the same home, or sending, country who had never migrated to Australia. Overall, the result suggests that migrant tastes for status are stronger than that of natives at the destination, but does not imply that those who migrate are more driven by status considerations than those that do not migrate.[16]

[14]Individual types, characteristics and preferences are summarised in Table 7 of Appendix A2.

[15]In contrast, a recent study using the European Social Survey (Clark and Senik 2010) finds income comparisons being more prevalent amongst the poor.

[16]To properly test for this type of behaviour, we would have to compare the relative concerns of migrants with people who did not migrate from those home countries. In the remainder of the paper, we shall interpret the found effect of migration as picking up a fixed individual trait of those who happened

Given the differences between survey instruments and empirical methodologies, we are unable to directly compare our results (or degree of preferences) to those found in earlier studies. In general, however, students in Australia seem to care about relative social standing in a positive manner as do the students and respondents in the USA (Solnick and Hemenway 1998) and Sweden (Johansson-Stenman *et al.* 2002; Carlsson *et al.* 2007). Furthermore, the apparent importance of income rank for choice behaviour is consistent with the findings in Brown *et al.* (2008) and Clark *et al.* (2009), where the authors find a positive and significant effect of a higher income rank on economic satisfaction.

5.2 Compensating Income for Loss of Status: The Static Model

In this section we estimate the income required to compensate an individual who experiences a loss of status. We develop a static choice problem where an individual moving between two societies, or neighbourhoods, fails to experience a fall in her utility level when the two societies are characterised by different income distributions. That is, we estimate the amount of income that an individual needs to receive after moving from a poor to a rich society, where in the latter her income rank is reduced. Because we only estimate this compensatory amount for the students in our sample, the results are valid for that group only and are at best merely indicative of more representative groups.

We have the following static problem:

$$U\left\langle Y_h, R_h(Y_h)\right\rangle = U\left\langle Y_d, R_d(Y_h)\right\rangle \tag{4}$$

where the subscripts h and d denote the society at home and the destination respectively; $R_h(Y_h)$ is the ordinal rank of income level Y_h in the income distribution at home; and $R_d(Y_h)$ is the ordinal rank of Y_h in the income distribution at the destination, where by construct $R_h(Y_h) > R_d(Y_h)$. We assume the individual to assimilate, and compare to others, at the destination instantaneously. As this is a quite strong behavioural assumption, we later study the case where migrants take some time to substitute reference groups, and hence do not experience the entire fall in status upon arrival. It should be noted that heterogeneity enters the model via: (i) preferences for income and rank, taken from the estimated probit model (3), which we interpret as fixed individual traits, and (ii) initial monetary incomes and positions within the home distribution.

To give the problem a real-world flavour, we base our analysis on the stylised choices of the well-documented migratory behaviour between Mexico (home, poor) and the USA

to have migrated to Australia, and not a trait that changes with migration.

(destination, rich), and describe incomes in each society using a lognormal distribution, denoted $LN(\mu, \sigma^2)$. Formally, a lognormal variable y has

$$E[y] = e^{\mu+\sigma^2/2} \tag{5}$$

$$Var[y] = e^{2\mu+\sigma^2}(e^{\sigma^2} - 1) \tag{6}$$

and the Gini coefficient is defined as

$$G = 2\left[\Phi(\sigma/\sqrt{2})\right] - 1 \tag{7}$$

where Φ is the cumulative normal density function (see Aitchison and Brown 1957). Consequently, the parameters μ and σ can be determined from the mean, $E[y]$, and the Gini coefficient, G, as follows:

$$\sigma = \sqrt{2}\left[\Phi^{-1}\left(\frac{G+1}{2}\right)\right] \tag{8}$$

$$\mu = ln\left(E\left[y\right]\right) - \sigma^2/2 \tag{9}$$

We obtain the parameters μ and σ of the lognormal income distribution in each country by substituting recorded values of output per capita, $E[y]$, and the Gini coefficient, G, into (8) and (9) above. Real GDP per capita in Mexico and the USA is $\$14,400$ and $\$46,600$ respectively, and the corresponding Gini coefficent values are 0.47 and 0.38 (OECD.Stat 2010). Thus, we model incomes at home (Mexico) and the destination (USA) as $Y_h \sim LN(9.18, 0.79)$ and $Y_d \sim LN(10.5, 0.49)$.

Figure 3 presents the solution to the static choice problem for four different migrant types (defined in Table 7, Appendix A2). The general estimates suggest that individuals residing in the bottom and middle parts of the home income distribution are required to be compensated quite a bit more than the elites, in order to be equally well-off in both societies. This results from the former group enduring a greater loss of status at the destination. The average female respondent requires the least amount of monetary compensation due to the low utility importance assigned to status. As expected, rank-sensitive individuals require the highest compensatory income given their strong preferences for income rank. A young rank-sensitive individual, earning an annual income of $\$14,000$ in Mexico, requires a permanent increase in income of $\$30,000$ in the USA. Similarly, the average male respondent requires an approximate permanent increase in income of $\$20,000$. In the following section, we improve on the above model and compensatory estimates by considering immigrant assimilation at the destination.

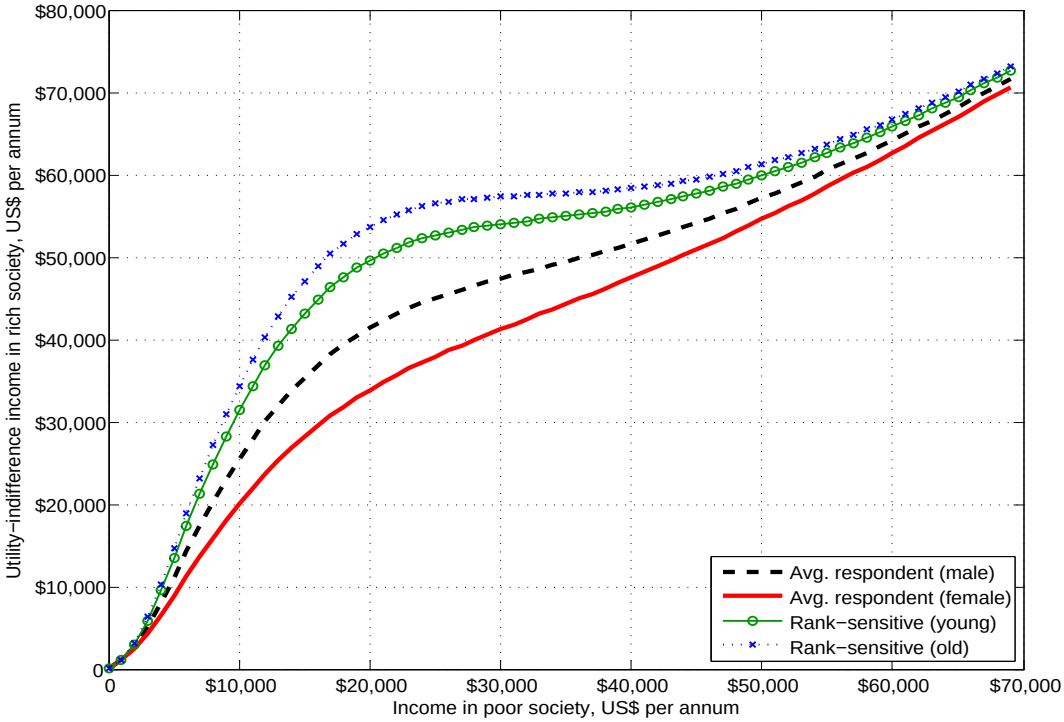


FIG. 3: Compensating Income for Loss of Status (Static Model)

5.3 Migrant Reference Groups

A novel part of the data set collected is the information on migrant reference groups. Migrants were explicitly asked whether they compared themselves, in terms of income level, to others from their home country or the country they currently reside:

> *In terms of personal achievement (such as Income), which of the two groups, would you say, you compare yourself to? (a) From Australia (b) From Home Country.*

Two-thirds of migrant respondents compared themselves to *family members, friends, and colleagues* from Australia, indicating the presence of reference group substitution. A key determinant of this reference group substitution is the length of time away from home. We observe the mean value of this variable to be 5.6 years, with 12 per cent of the migrants having arrived in Australia less than 1 year ago; 50 per cent between 1 and 5 years; 22 per cent between 6 and 10 years; 14 per cent between 11 and 20 years; and 2 per cent arrived more than 20 years ago.

To find out more, we analyse the effects of 'time away from home', and other migrant characteristics, on the probability of reference group substitution. The binary response variable y_i is set to 1 if individual i compares to others in the society abroad (i.e. Australia), and $y_i = 0$ if the individual relates to others in the home society. Here, we interpret

$y_i = 1$ as migrant reference group substitution or, in other words, complete assimilation.

Table 4 presents the binary logit coefficient estimates. 'Time away from home' seems to be an important determinant of reference group substitution. The positive coefficient suggests that the more time migrants spend away from home, the more likely they are to form peer groups at the destination. Gender, relationship status, and family wealth play no part in determining reference groups. The age characteristic is statistically insignificant at the 10 per cent level, however the corresponding coefficient intuitively suggests that young migrants adapt better to new cultures and surroundings relative to the elder. Not surprisingly, migrants with more prominent job titles alter their reference groups more frequently. These individuals are employed as white-collar managers, supervisors and senior professionals, taking on high levels of responsibility and interest in their workplace. One feature of such positions is the presence of large social networks, making it less difficult to form new friends and work colleagues. Moreover, these individuals may be choosing reference groups based on their comparative advantage in obtaining high status (see Frank 1985).

Table 4: Probability of Reference Group Substitution

Variable	Coefficient Est
Constant	1.391 (0.17)
Age	−0.060 (0.10)
Male	−0.148 (0.63)
Partner	0.091 (0.81)
Family wealth	−0.140 (0.40)
Job title	**0.574** (0.01)
Time away from home (yrs)	**0.227** (0.00)
Number of observations: 249	
Log-likelihood: −126.4	

Note: Dependent variable equals 1 if individual compares to others at destination, and 0 otherwise. P-values in parentheses. Bold denotes statistical significance at the 1% level.

Figure 4 shows assimilation profiles for different migrant types, who are of the same characteristics as the individuals studied in the static problem above. The average male migrant assimilates to about 85 per cent after 10 years at the destination, while the average female migrant's degree of assimilation is closer to 90 per cent after the same amount of time. The effect that a higher job title (or education level) and age have on the initial propensity to assimilate is also evident: The 'young rank-sensitive' individual's

superior job title translates into more than a 0.15 higher initial probability of assimilation relative to the average respondent. The same individual type has a 0.25 probability advantage over his older counterpart ('rank-sensitive, old'), where the latter agent is 17 years older than the former. The estimated and projected time(s) for immigrant assimilation is consistent with that found by empirical studies within the economics and other social sciences literature, where assimilation can be defined over many different dimensions including adaptation to the destination's culture, values and traditions, and the convergence of immigrant and native incomes. Most of these studies estimate immigrant earnings to overtake that of natives after about 20 years (at the destination), and similar durations are reported for the other cultural adaptation measures (for a survey, see Bodvarsson and Van den Berg 2009).

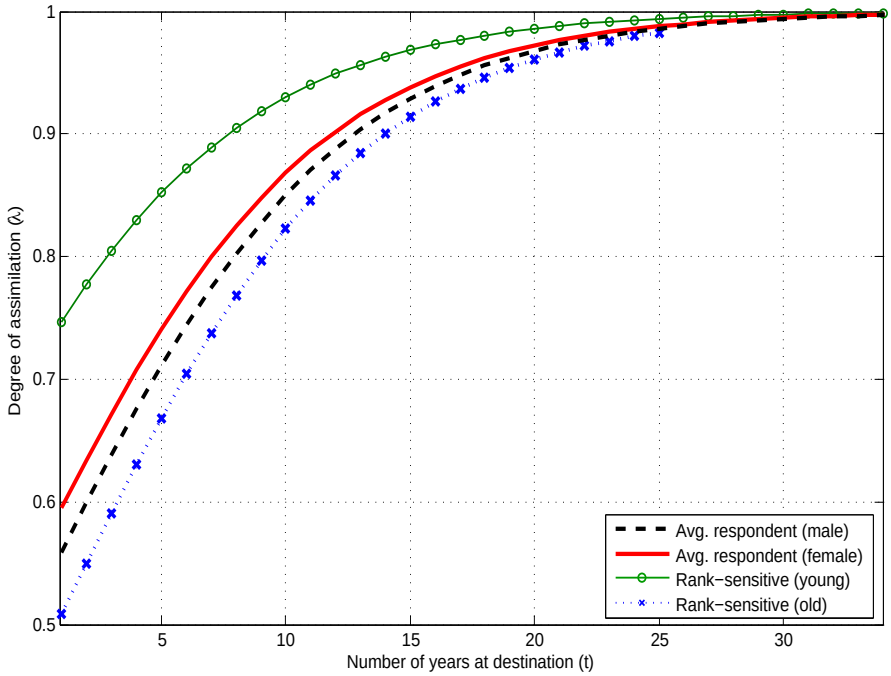


FIG. 4: Degree of Migrant Assimilation over Time

5.3.1 Compensating Income for Loss of Status with Endogenous Assimilation

We use the above assimilation model to derive the dynamic form of compensating incomes for migrants who, by construct, endure a loss of status at the destination. The notion that reference group substitution takes time is included in the model by allowing the importance of a lower income rank abroad (in period t) to be determined by the degree of

assimilation (in period t). Thereby, low status abroad is not realised immediately upon arrival. Instead, its importance gradually increases with the length of time away from home. The degree of assimilation, after t periods, is estimated using the logit probability model from Table 4. We do so for different migrant types, while keeping in mind that the 'time away from home' and 'age' characteristics increase with t. We have the following programming problem:

$$\sum_{t=1}^{T_i} e^{-\rho t} \left[U_{it} \left\langle Y_h, R_h(Y_h) \right\rangle \right] = \sum_{t=1}^{T_i} e^{-\rho t} \left[U_{it} \left\langle Y_d, R_d(Y_d) \right\rangle \lambda_{it} + U_{it} \left\langle Y_d, R_h(Y_d) \right\rangle (1 - \lambda_{it}) \right] \quad (10)$$

where $T_i - t$ is the number of years that individual i still has to live, ρ is the discount rate for future years, and $0 \leq \lambda_{it} \leq 1$ is the degree to which i has assimilated into the society at the destination. Individual $i's$ status then consists of two parts: (i) rank at the destination $R_d(Y_d)$, and (ii) rank of the destination income back home $R_h(Y_d)$.[17] The relative weight assigned to each component of status changes in each time period as the individual gradually assimilates at the destination and changes reference groups; that is, as $\lambda_{it} \to 1$.

The idea behind this approach is to ask an individual who is contemplating to migrate in period 1, and is aware of the dynamic changes in the utility function, how high her permanent annual income would have to be in order to have the same discounted utility abroad as in the situation with no possible migration. To determine this amount, we return to the previously defined income distributions of Mexico (home, poor) and the USA (destination, rich), and search ordered pairs of incomes (Y_d, Y_h) for which equality (10) holds. This dynamic choice model includes three types of heterogeneity: (i) preferences for income and status, (ii) degree of assimilation over time, and (iii) initial incomes and positions in the home income distribution. We set $T_i = 65 - Age_i$, i.e. the migrant is assumed to endure the given loss of status until the age of 65 (end of a working life). The calculations are done for an annual discount rate ρ of 5 per cent.

Figure 5 presents the solution to (10) for different migrant types. As in the static case, migrants who occupy the bottom-half of the income distribution in the poor society require the highest monetary compensation at the destination. The permanent increase in annual income required for a rank-sensitive individual, who is not amongst the elite

[17] As pointed out by a referee, in addition to the two dimensional status component (based on region), there exists evidence of income adaptation, where individuals derive utility from their own income today relative to incomes enjoyed in the past; see, for example, Clark *et al.* (2008). The latter comparison could also improve due to the migration decision, and hence adds another dimension to the status component. Due to data limitations and for simplicity, we ignore this type of comparison.

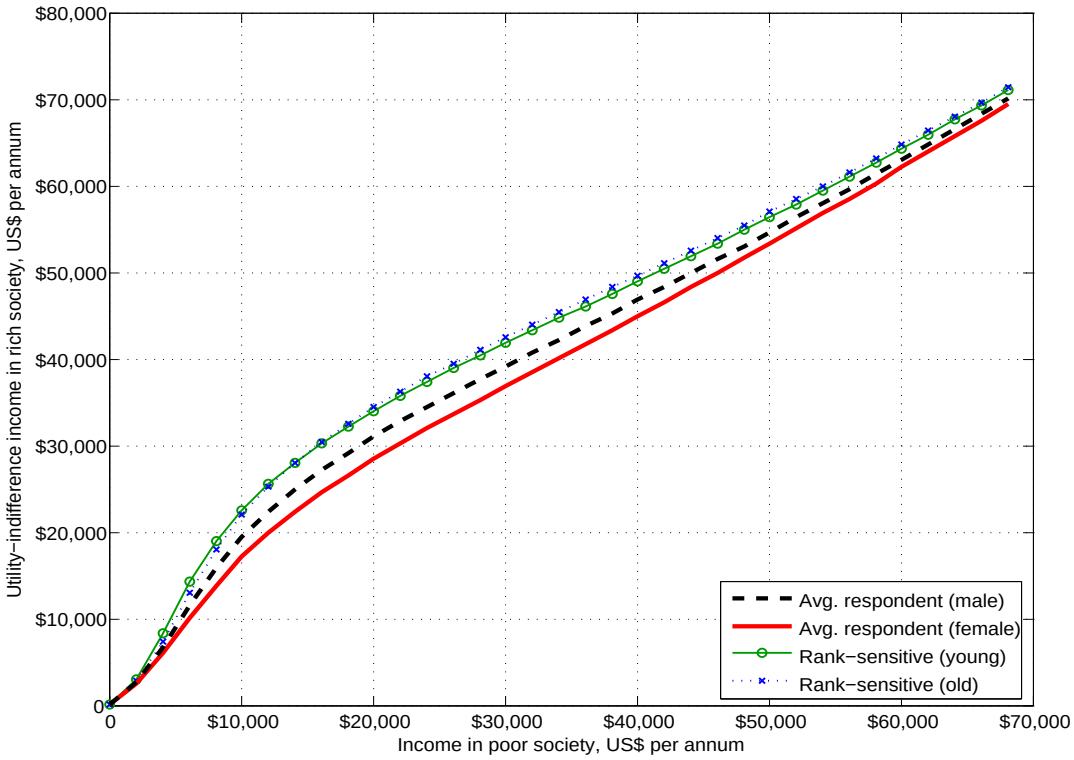


FIG. 5: Compensating Income for Loss of Status with Endogenous Assimilation

(in Mexico), is approximately $\$15,000$. For elite migrants, the compensatory income is approximately half of the latter amount ($\$7,500$) due to such individuals not experiencing as large of a fall in rank after migrating. Even though the average female respondent assimilates into the richer society at a relatively high rate, the low utility weight attached to status results in her demanding a low level of monetary compensation. On the other hand, a male average respondent, who considers status to be more important, requires a permanent increase in annual income of approximately $\$10,000$.

6 A 'Relative' Beauty Contest

What form of relative income do individuals maximise? Do individuals really care about some form of relative income, or about entirely different aspects of the hypothesised income distributions, such as the degree of inequality or the poverty rate? These are important, however somewhat neglected, questions within the relative utility literature. The importance of the issue arises from the proposition that choice behaviour and social welfare differ under the alternative measures of relative income; see, for example, Layard (1980, 2005), Hopkins and Kornienko (2004), Stark and Wang (2005), and Bilancini and Boncinelli (2008).

In most empirical studies, relative income is expressed as difference comparison income, $Y_i - \overline{Y}$, or ratio comparison income, $Y_i/\overline{Y}$, where individuals are assumed to compare themselves to the average in society, $\overline{Y}$. There, status and utility are determined by how much higher or lower Y_i is relative to $\overline{Y}$. Another popular measure of relative income is drawn from sociology. Runciman (1966) assumes that people compare themselves with others, and feel relatively deprived when others have what they desire. This form of social comparison has been included in economic models of income inequality (Yitzhaki 1979) and labour migration (Stark and Taylor 1991). In these studies, relative deprivation is defined as the proportion of individuals in $i's$ reference group who are richer than i, weighted by their mean excess income: $RD_i = (1 - R(Y_i))\, E\,(Y_{-i} - Y_i \mid Y_{-i} > Y_i)$, where $R(Y) \in [0, 1]$ denotes a cumulative density function of income.

We learn which of the above measures accounts for the data better by predicting the observed choices using different combinations of income measures and consequently comparing the resulting log-likelihood values.[18] In addition to the absolute and relative income measures discussed so far, we include two measures of income inequality: (i) standard deviation of income in society, and (ii) a poverty measure, defined as the proportion of individuals below half of the mean-income in society.

Table 5 reports the values of log-likelihood functions from the estimated binary probit models. The 'top 10' models (attribute combinations) are presented in the order from highest to the lowest log-likelihood value.[19] The highest log-likelihood value is realised when difference comparison income $(Y_i - \overline{Y})$ and absolute income (Y_i) enter as the two attributes in the choice model. Similar log-likelihood values are obtained by pairing income rank and ratio comparison income with absolute income, respectively. From these latter models, income rank seems to explain the observed choice behaviour slightly better, with the statistical difference being trivial. The other included measures of income inequality and poverty also perform relatively well in explaining subject choices, occupying posi-

[18] An alternative approach would be to estimate a structural model with all the relative income concepts included at the same time. This approach however gives rise to collinearity issues as each relative income measure is a function of absolute income. For example, 98 per cent of the variation in absolute income (in the data) is explained by the variation in income rank, relative deprivation, and average income in society, making estimates of models with many income constructs fruitless. This issue is, unfortunately, almost unavoidable. In order to get more independent variation between the different income concepts, one would have to resort to using unrealistic distributions (such as a binary distribution) in which case the question arises whether respondents would be able to envisage how such a society would look like. We hence face a trade-off between realism and the ability (ex-post) to separately identify the contribution of each income or status concept.

[19] Other results from (outside 'top 10') models where, for example, *income rank* and *difference comparison income* enter as arguments are also available upon request from the authors.

tions 5 and 6. Overall, we conclude that rank is among the top three fitting measures of relative income (however, not the top measure), with the differences in predictive power being very small. At the same time, such close results (based on a two-attribute choice model) reinforce our inability to discriminate between models with income rank and other relative income measures included, a careful task that we leave for future research.

TABLE 5: WHICH 'RELATIVE INCOME' MEASURE EXPLAINS RESPONDENT CHOICES BETTER?

Model	*Attributes*	*Log-Likelihood*
1	Abs Income	
	Diff Comp Income	−7754.66
2	Abs Income	
	Income Rank	−7757.44
3	Abs Income	
	Ratio Comp Income	−7757.48
4	Abs Income	
	Rel Deprivation	−7762.22
5	Abs Income	
	Poverty Measure	−7763.25
6	Abs Income	
	Std Dev of Income	−7763.68
7	Ratio Comp Income	
	Std Dev of Income	−7794.71
8	Ratio Comp Income	
	Poverty Measure	−7819.75
9	Rel Deprivation	
	Std Dev of Income	−7820.14
10	Std Dev of Income	
	Poverty Measure	−7825.41
Number of observations:	11,748	

NOTE: Each binary probit model is estimated using responses for choice situations 1 to 12. The 'top 10' models (attribute combinations) are included in the order from highest to lowest log-likelihood value.

7 Conclusions

This paper used a novel survey instrument to study the preferences of Australian university students over absolute and relative income as revealed by their choices in hypothetical income distributions. The three main interests concerned: (i) the utility importance of income rank relative to absolute income, (ii) the endogeneity of migrant reference groups, and (iii) the most predictive form of relative income.

We find that income rank matters relative to absolute income, where the resultant preference parameter is estimated to be higher for males, migrants, and individuals from wealthy families. The most rank-sensitive individuals attach an almost equal weight to rank and absolute income, implying they would require as much as a 200 per cent increase in income to be compensated for a complete loss of rank (that is, to move from the 'top of a small hill' to the 'foot of a big hill').

In terms of reference groups, we find migrants who reside abroad for longer periods of time, and with more affluent job titles, to be more likely to compare with others at the destination. Using this information, we introduced a dynamic problem of compensating incomes. Heterogeneity entered this model via: individual tastes, assimilation rates, and initial relative standings within the home society. We used the model to calculate the amount of additional income that a rational immigrant with reduced status required in order to enjoy the same discounted lifetime utility as in the case where he or she had not migrated. The model predicts the average respondent from a low-income society (for example, such as Mexico, where real income per capita is $14,000$ US$) required a permanent income increase of up to $\$10,000$ (70 per cent) in order to move to a richer society such as the USA.

Our final interest involved the form of relative income that explains observed choices best. We ran an econometric 'beauty contest' between various measures of income, status, and inequality. Based on estimated values of the likelihood function, income rank accounted for observed choices nearly as well as difference comparison income, and produced an almost identical model fit as ratio comparison income. These three forms of relative income predicted choices better than relative deprivation, relative poverty, and the standard income inequality measures, which suggests that individuals are pursuing the more simple measures of social status.

The novel survey instrument used in this study has enabled us to examine entire income distributions, coupled with the notion of endogenous reference group formation. Despite this richness, using stated-preferences entails some important limitations. Most

apparent, what people say they will do is often not the same as what they actually do. Even if participants do respond as if they applied their true utility weights to the attributes presented in the choice experiment, the choice scenarios are quite different from a real-life situation in which migration costs will be non-negligible. Moreover, the type of migrants that we observe, namely college students, may not represent the average migrant to a great extent since foreign students are usually more educated and come from wealthier families than other classes of migrants. These shortcomings, along with others, are detailed by Bertrand and Mullainathan (2001), and more recently by Levitt and List (2007). Additionally, Carlsson *et al.* (2009) discuss specific problems in current approaches to measuring relative preferences.

Overall, the notion that people's utility is partially determined by how their income compares to that of others in society seems to be a settling debate. On the other hand, the form of relative income that individuals relate to is yet to be agreed upon. This issue is important for the policymaker as choice behaviour and social welfare are set to differ under the alternative measures of relative income. For instance, if we consider individuals to be sensitive to income rank instead of ratio comparison income, then there always exists an individual who is placed first and another individual who is placed last, i.e. the overall amount of rank is immutable. Or, as described by Layard (1980): "*The pursuit of status is a zero-sum game - one man's gain in rank is another man's loss*". Such a constraint implies no direct role for the redistribution of income (however, there still may be an indirect role via the effort individuals waste on increasing their rank, see Frank 1985). On the other hand, if utility depends, in a concave manner, on (average) comparison income, then overall utility can be increased via transfers from the rich to the poor, strengthening the case for redistribution that could be made on the basis of the importance of absolute income for utility. Similarly, as in Frank (1985), it may be possible to observe several rank-races, where multiple individuals are led to believe that they occupy first place. Such behaviour is difficult to imagine when individuals care about their position relative to the average in society.

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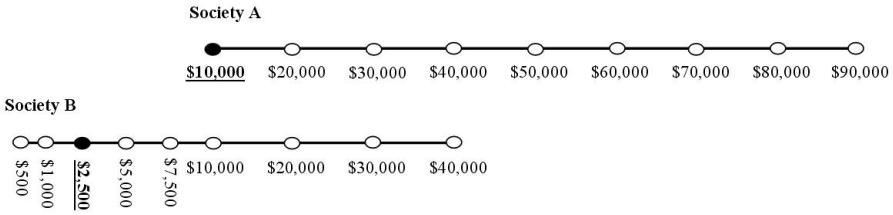
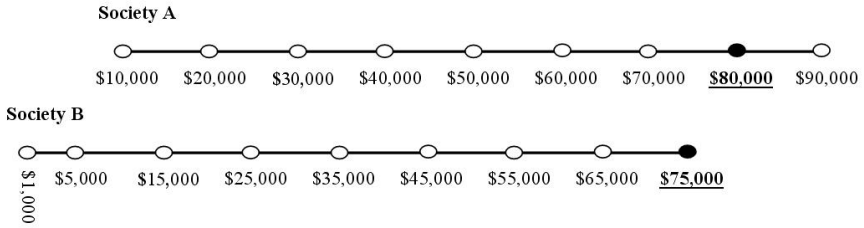
A Appendix

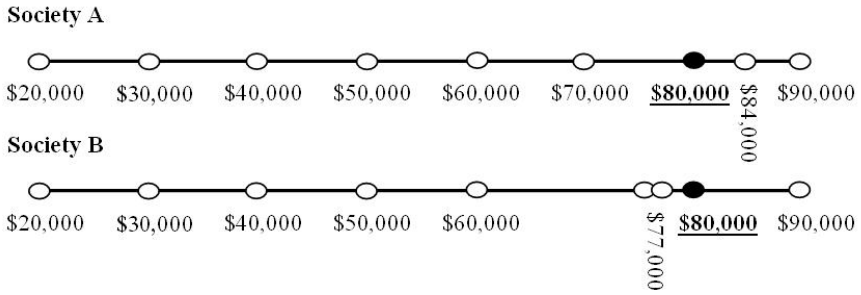
A.1 Other Choice Situations: Survey version 1



(a) Choice Situation 3 (Income Rank vs. Absolute Income)

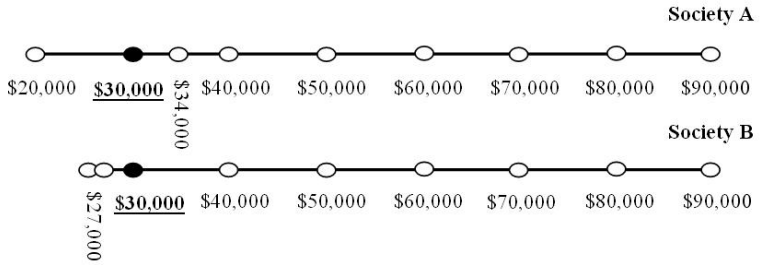


(b) Choice Situation 5 (Income Rank vs. Absolute Income)

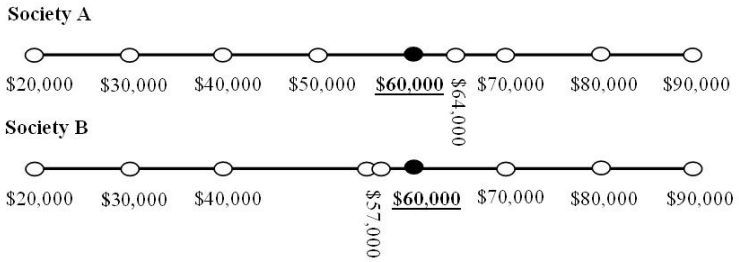


(c) Choice Situation 6 (Income Rank vs. Absolute Income)

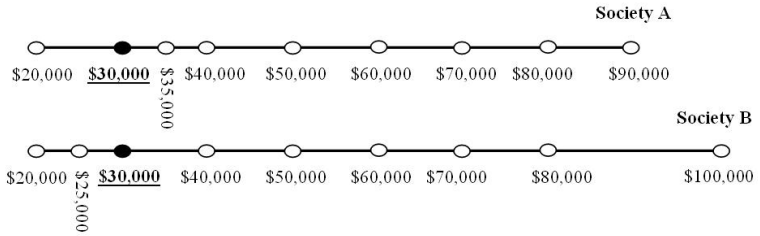
FIG. 6: Choice Situations 3, 5 and 6



(a) Choice Situation 8 (Income Rank vs. Avg Income Comparisons)



(b) Choice Situation 9 (Income Rank vs. Avg Income Comparisons)



(c) Choice Situation 11 (Income Rank vs. Relative Deprivation)

FIG. 7: Choice Situations 8, 9 and 11

A.2 Other Summary Statistics and Descriptive Results

Table 6: Correlation Matrix of Choice Attributes

	Abs Income	Income Rank	Avg Inc Society	Diff Comp Income	Ratio Comp Income	Rel Dep
Abs Income	1					
Income Rank	0.80	1				
Avg Inc Society	0.51	-0.08	1			
Diff Comp Income	0.84	0.98	-0.04	1		
Ratio Comp Income	0.66	0.89	-0.16	0.86	1	
Rel Dep	-0.76	-0.93	0.12	-0.95	-0.77	1

Note: Correlation coefficients between choice attributes for choice situations 1 to 12, where each choice situation consists of societies A and B. Each attribute vector is of size (22×1), see Table 2.

Table 7: Individual Types, Characteristics, & Preferences

Individual type	Set of characteristics (X_i)	Pref. parameters (a, b)
Reference Individual	22.48, 0, 0, 0, 3.35, 0	0.7341, 0.0277
Average Respondent ♀	22.48, 0, 0, 1.12, 3.35, 0	0.7541, 0.0417
Average Respondent ♂	22.48, 1, 0, 1.12, 3.35, 0	0.8134, 0.1930
Rank-Sensitive, young	22.48, 1, 0, 3, 5, 1	0.9678, 0.6248
Rank-Sensitive, old	40, 1, 0, 3, 5, 1	0.8178, 0.7087
Migrant type		
Reference Individual	22.48, 0, 0, 0, 3.35, 1	0.7298, 0.2132
Average Respondent ♀	22.48, 0, 0, 1.12, 3.35, 1	0.7498, 0.2272
Average Respondent ♂	22.48, 1, 0, 1.12, 3.35, 1	0.8091, 0.3785
Rank-Sensitive, young	22.48, 1, 0, 3, 5, 1	0.9678, 0.6248
Rank-Sensitive, old	40, 1, 0, 3, 5, 1	0.8178, 0.7087

Note: X_i = [Age, Gender, Partner, Job Title, Family Wealth, Migrant]. Definitions and summary statistics of socioeconomic variables are reported in Table 1.