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### *Absolute or Relative Utility?*

The basic idea: utility depends on the behaviour of relevant others (the reference group), either through their consumption (direct utility function), or through their income (indirect utility function). As opposed to looking at behaviour, one approach consists in attempting to measure utility directly and model the relationship with both income and “comparison income” (as income is easier to measure than consumption).

How can we measure utility? Not very easily perhaps. Many studies have used measures of life satisfaction or of overall happiness as proxy utility measures. Others, more concentrated on the labour market, have considered the relationship between overall job satisfaction, income and comparison income.

### **A criticism**

“ ce que les individus disent n’est que du bruit et ne reflète pas leur comportement ”

Cependant, diverses études ont montré que ces mesures prédisent

- l’espérance de vie
- la morbidité
- les entrées en hôpital psychiatrique
- la productivité
- l’absentéisme
- les démissions volontaires
- la durée du chômage

Bref, quand les individus DISENT qu’ils sont pas contents, ils AGISSENT aussi comme si ils ne l’étaient pas.

Who's in the reference group? Comparison income can be defined as the income of

**To whom do we compare?**

- Peer group/people like me (Clark and Oswald, *Journal of Public Economics*, 1996).
- Others in the same household (Clark, *Economie et Prévision*, 1996)
- Spouse/partner
- Myself in the past (Clark, *Journal of Economic Behavior and Organization*, 1999).
- Friends
- Neighbours
- Work colleagues
- "Expectations"

Note the special case where behaviour and utility would give different answers regarding the existence of comparisons: separable utility.

If  $U = u(X) + u^*(X^*)$ , with  $u' > 0$  and  $u^{*'} < 0$ , then the presence of  $X^*$  in  $U$  does not affect behaviour (same first-order conditions from utility maximisation). However,  $X^*$  will still affect individual utility and thus social welfare.

OVERALL JOB SATISFACTION AND CHANGE IN WAGES

Log current monthly pay	0.086 (0.071)	0.486 (0.166)	0.042 (0.072)	0.038 (0.072)
Log current monthly hours	-0.019 (0.050)	-0.099 (0.068)	0.026 (0.055)	0.015 (0.051)
Log monthly pay one year ago	..	-0.442 (0.163)	..	..
Log monthly hours one year ago	..	0.121 (0.067)	..	..
% Change in pay/100	..	..	0.439 (0.146)	..
% Change in hours/100	..	..	-0.518 (0.285)	..
% Change in hourly wage/100	..	..	..	0.450 (0.126)
Male	-0.257 (0.063)	-0.255 (0.063)	-0.255 (0.063)	-0.254 (0.063)
Age	-0.028 (0.016)	-0.022 (0.016)	-0.021 (0.016)	-0.021 (0.016)
Age-squared/100	0.046 (0.020)	0.039 (0.020)	0.039 (0.020)	0.038 (0.020)
Health excellent	0.413 (0.071)	0.419 (0.071)	0.418 (0.071)	0.419 (0.071)
Health good	0.142 (0.064)	0.148 (0.064)	0.148 (0.064)	0.148 (0.064)
Education higher	-0.254 (0.077)	-0.249 (0.077)	-0.247 (0.077)	-0.247 (0.077)
Education A/O/Nursing	-0.226 (0.065)	-0.228 (0.065)	-0.230 (0.065)	-0.230 (0.065)

[Plus other control variables for marital status, ethnicity, region, industry and occupation].

*Source:* Clark (1999).

Following and Deviancy (From Clark and Oswald, 1998)

Define the agent's utility function as exhibiting *additive comparisons*, as follows:

$$U = sv(a-a^*) + (1-s)u(a) - c(a) \quad (1)$$

The function  $v$  is to be thought of as capturing the utility from comparisons. Its first derivative will be taken to be positive; its second derivative may be positive or negative (corresponding to comparison-convex or comparison-concave utility). Thus people enjoy surpassing others' actions. This, in our model, is what gives status. The function  $u$  is increasing and concave in  $a$ . The cost function  $c(a)$  is increasing and convex in  $a$ . The variable  $s$  is a parameter in the unit interval.

Utility depends upon a convex combination of a direct private component of utility and a status- or comparison-oriented element of utility. The weights,  $(1-s)$  and  $s$ , provide a simple way to capture the mix of effects. As  $s \rightarrow 0$ , the traditional economist's model holds. Preferences are private and self-interested; agents do not look over their shoulders to see what other individuals are doing. As  $s \rightarrow 1$ , only relative position matters, and an extreme 'sociological' model applies. Relativities play a paramount role in such a model.

To choose his or her optimal action, the individual with concern for additive comparisons maximizes expression (1). For an interior maximum:

$$sv'(a-a^*) + (1-s)u'(a) - c'(a) = 0. \quad (2)$$

The first term is the marginal benefit from status; the second is the direct marginal benefit from action  $a$ ; the third is marginal cost.

The first analytical result stems from differentiating implicitly in equation (2) to give the individual's response to others:

$$da/da^* = sv''(a-a^*)/[sv''(a-a^*) + (1-s)u''(a) - c''(a)] \quad (3)$$

The denominator on the right-hand side of equation (3) is negative by the requirement that the maximization problem be concave. Hence the sign of the response of  $a$  to  $a^*$  depends upon the negative of the numerator. Comparison-concave utility, defined as  $v''(a-a^*) < 0$ , therefore implies that a rise in others' actions leads the agent to increase his or her own action,  $a$ . Individuals with utility functions linear in comparisons ( $v''(a-a^*)=0$ ) act precisely independently of other people. Agents with comparison-convex utility behave in a way that deviates from other agents' behaviour: movements in  $a^*$  induce them to alter their action in the opposite way from  $a^*$ .

### An example

Consider an economy with two types of agent: 'leaders' (subscript 1) and 'followers' (subscript n). The utility of both is given by the weighted sum of two quadratic functions, representing utility from the relative and absolute value of the action respectively. Time lags in information are assumed, so that individuals react to past values of  $a^*$ . The unit costs of activity  $a$  are  $c_1$  for leaders and  $c_n$  for followers.

$$U_1 = s_1\beta_0(a_{1t}-a_{nt-1}) + s_1\beta_1(a_{1t}-a_{nt-1})^2 + (1-s_1)\beta_2a_{1t} + (1-s_1)\beta_3a_{1t}^2 - c_1a_{1t} \quad (34)$$

$$U_n = s_n\gamma_0(a_{nt}-a_{1t-1}) + s_n\gamma_1(a_{nt}-a_{1t-1})^2 + (1-s_n)\gamma_2a_{nt} + (1-s_n)\gamma_3a_{nt}^2 - c_na_{nt} \quad (35)$$

The direct component of utility is increasing and concave for both leaders and followers ( $\beta_2, \gamma_2 > 0; \beta_3, \gamma_3 < 0$ ). Leaders have comparison-convex relative utility ( $\beta_0, \beta_1 > 0$ ), while that of followers is comparison-concave ( $\gamma_0 > 0; \gamma_1 < 0$ ).

Cycles will occur if one, but not both, of the types of agent has comparison-concave utility. The following simulations show how cycles result from a shock. The leaders' utility function is parameterised as  $\beta_0=0.5, \beta_1=0.1, \beta_2=0.5$  and  $\beta_3=-0.1$ ; the weight on relative action,  $s_1$ , is set to 1/3 and the unit cost of action,  $c_1$ , equals 0.1. For followers,  $\gamma_0=0.5, \gamma_1=-0.1, \gamma_2=0.5$  and

$\gamma_3 = -0.1$ ; the weight on relative action,  $s_n$ , is set to  $2/3$  and the unit cost of action,  $c_n$ , also equals 0.1. Leaders thus put less weight on the relative part of utility than do followers. Agents are initially in equilibrium and the shock occurs at time  $t=10$ . Figure 1 maps out the reaction to a fall in leaders' costs (from 0.1 to 0.05). The parameter values produce cycles which largely die away about fifteen time periods after the initial shock. The new equilibrium entails greater levels of the action for both leaders and followers.

## Politique économique

- Si  $W=W(y/y^*, \dots)$  la maximisation du PIB par tête n'amène pas le bonheur.
- La satiété n'existe plus : une fonction d'utilité  $W=W(y/y^*, \dots)$  implique que chaque augmentation de revenu ou consommation est de somme nulle.
- La taxation progressive augmente le bonheur (si on se compare aux riches).
- Les comparaisons par rapport au chômage peuvent expliquer le phénomène d'hystérèse du chômage (Lorsque le chômage augmente en moyenne, au niveau individuel les effets psychologiques du chômage sont moindres, les chômeurs consacrent moins d'effort à la recherche d'un emploi, donc le taux de chômage d'équilibre augmente).
- Une baisse de chômage réduit l'utilité de ceux qui restent chômeurs.
- Targetted interventions : quel groupe de référence est le plus important ? Dans notre recherche actuel sur consommation de cigarette et d'alcool par des adolescents, on trouve que les individus sont plus influencés par le comportements des hommes que des femmes.
- Effet heures de travail. Les individus réfléchissent en équilibre partielle et non pas en équilibre générale. On imagine pouvoir grimper dans le ranking en travaillant plus (mais tout le monde agit de sorte, et donc personne ne change de statut). En fin de compte, on travaille de trop (les bienfaits cachés de la RTT).
- L'inégalité peut diminuer la pression de comparaison. Si les autres sont " trop loin ", j'arrête d'essayer de les rattraper.
- Comparaisons par rapport aux autres événements de la vie : une norme sociale de la santé ? du mariage ?
- On peut s'habituer à tout ? Une étude récente a démontré que les individus ne s'habituent pas au bruit, par exemple.
- Enfin, soulignons que ces résultats empiriques ont été obtenus sur des données portant sur les pays développés. On imagine que les choses peuvent être différentes pour les pays moins riches. Peut-être que les comparaisons sont des luxes.

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