Economic Analysis and the Psychology of Utility: Applications to Compensation Policy

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Standard economic analyses often rely on the modern conception of the utility function that resembles a black box. People reveal their utility function through their choices. However, this modern view of utility is not the only possible conception. An earlier view, that associated utility with the pleasures of consumption, prevailed in economics from the days of Daniel Bernoulli and Jeremy Bentham and through the nineteenth century (George Loewenstein, 1991; George Stigler, 1950). We shall refer to this older notion as experienced utility, in contrast to the revealed preference notion we call decision utility. Since, experienced utility is presumably what people try to maximize and what welfare policies are about, the use of decision utility in economic analyses can only be justified if experienced and decision utility coincide. Recent psychological research, however, suggests several reasons why the concepts might in fact diverge (Kahneman and Carol Varey, 1991; Kahneman and Jackie Snell, 1990).

In this paper we try to illustrate the potential uses of an experienced utility concept by considering some aspects of compensation policy that would normally be ignored in a standard economic analysis. Such factors include the timing of payments over the course of the year, especially the use of lump sum bonuses, and the earnings profile over the worker’s life. To a first approximation, the standard economic model assumes that the utility of a compensation package to a worker is invariant with respect to changes in details if the after-tax present value of the payments is held constant. In this paper we argue for a richer and more psychologically realistic characterization of the quality of experiences that includes the following additional factors: adaptation, contrast, interpersonal comparisons, loss aversion, and fairness. If these factors are included, then it could be possible to create more worker satisfaction without increasing the cost of the pay packages—a free lunch.

I. Adaptation

What is the utility of an income stream? Does the temporal distribution of that stream affect the utility? Can workers be made happier simply by rearranging the timing of their paychecks? These questions are easily dismissed as trivial or meaningless. However, the convergence of evidence from survey data concerning income satisfaction and from psychological studies of adaptation suggests that the questions could be meaningful and the answers interesting. The central problem to be overcome is that of adaptation, the tendency to view that which is perceived as normal to be neutral, neither good nor bad. If people quickly adapt to whatever they are being paid, then no matter how high their salary rises, they never stay happier for long. We first review the evidence that this adaptation process is ubiquitous, and then consider what steps can be taken to mitigate its effects.

The essential results of many studies of income satisfaction and of the effect of income on self-reported happiness are summarized in three propositions (see Michael Argyle, 1987): 1) A cross-sectional study within any society at a particular time is likely to reveal a substantial correlation between income and satisfaction. 2) Societies that differ greatly in income nevertheless have very
similar mean levels of satisfaction. Furthermore, large changes of income level over time within any one society have no effect on income satisfaction. 3) Comparisons to others and especially to one’s past determine the standard of satisfaction with income.

These results should probably not be dismissed as a mere artifact of verbal response, because they fit a broader class of observations—about adaptation and habituation to steady states (Harry Helson, 1964). Consider the familiar example of adaptation to temperature. As we all know, there is a substantial “comfort zone” within which we can adapt to temperature. The adaptation temperature is experienced as neutral, or hardly experienced at all. Temperatures that are higher or lower are experienced as hot or cold. To convince yourself of the power of the effect, prepare three pans of water: hot, cold, and tepid. Place one hand in the hot pan, one in the cold pan. Wait a short while, then put both hands into the middle pan. One will feel hot, the other cold. This is an example of the phenomenon of adaptation. One of the functions of this mechanism is to maximize the throughput of information by treating a maintained state as a default or null state, and deviations of it as information to be signalled. In the context of hedonic experience (utility, happiness etc.), the phenomenon of adaptation has suggested to some that people are doomed to march forever on a hedonic treadmill (Philip Brickman and Donald Campbell, 1977). This pessimistic conclusion is in accord with the studies mentioned above, concerning the effects of income on welfare. It is also supported by Brickman et al.’s (1978) study of paraplegics and lottery winners. Surprisingly, once these two groups had become adapted to their new situations, they rated their own happiness quite similarly to other people.

It may be possible to defeat or at least retard adaptation, and in so doing, obtain more utils per unit of pay. To do so, however, we must exploit some relevant characteristics of the adaptation mechanisms (the plural is deliberate, because several distinct mechanisms serve the adaptation function).

Here we single out three of them.

1) To enhance the incidence or intensity of a particular sensation, it should be made intermittent over time and scattered over space, if that dimension is relevant. Putting on red glasses is not a good strategy to obtain an intense experience of seeing red. Indeed, the most intense reds will be perceived in the spatial and temporal vicinity of contrasting greens. Contrast enhances experience. The implications of this point for various hedonic experiences should be obvious.

2) A single experience is less likely to alter the reference level if it is viewed as unusual or distinctive. This result is illustrated by a series of studies in which subjects judge the weight of each of a series objects lifted in sequence. In general, the geometric mean of the weights lifted becomes the adaptation level, and is perceived as neither heavy nor light. In some studies, subjects first lift (but do not assess the weight of) some “anchor stimulus” (such as a tray of objects) before every trial. A reliable finding is that the anchor affects the adaptation level, although not to the same extent as it would if it were made relevant to the judgment task. Thus, a heavy anchor will pull up the adaptation level. A more interesting finding is that the anchor has very little effect if it is qualitatively different from the stimuli judged in the series. If the anchor is made very distinctive and ostensibly irrelevant, it has no effect at all. These results suggest that a distinctive pleasurable event will not have a great impact on adaptation level. A bonus need not make the next paycheck appear painfully small.

3) Gradual changes and “spikes” have rather different effects on adaptation levels. Sudden changes are noticed and evaluated as a distinctive departure from adaptation, whereas a very slow gradual change will drag the adaptation level along with it, and may not even be detected.

The general conclusion is that it is certainly possible to use the same amount of money to produce different amounts of utility! The suggestion is that, for an income stream that is sufficient to prevent serious deprivation (compare comfort in the temp-
perature example), there exists a positively skewed distribution of the income over time that will yield greater utility than an even distribution. In particular, taking a portion of the compensation and paying it in a lump sum would appear to make things better.

To see whether this idea appeals to prospective employees, we conducted a small pilot study of attitudes about payment schedules. A group of Cornell University undergraduate students taking a class in psychology were asked whether they would prefer a salary of $26,000 paid in weekly increments of $500 or a salary of $25,000 paid in equal weekly installments and a $1000 bonus paid midyear. Nearly three-quarters of the subjects (73 percent) preferred the latter plan. (Larger bonuses were less popular.)

II. Side Effects of Bonuses: Saving and Splurging

Our discussion so far has treated the experienced utility of income as a criterion to be maximized. This is somewhat misleading, of course, because the utility of receiving a paycheck and the general sense of satisfaction with one's income are not what most people work for. The evaluation of a payment schedule implicitly invokes assumptions about the scheduling of consumption. Our argument therefore depends on the conjecture that people do not perfectly smooth their consumption when their compensation includes one or two fairly large increments to an otherwise even rate of pay. Instead, they tailor their routine expenses to their "normal" weekly or monthly income, with a different pattern of spending for the lump payments. Our second conjecture is that the altered pattern of expenditures is likely to be advantageous both to the workers and to the economy.

In 1976, Tibor Scitovsky used the principles of adaptation theory to develop an argument about the optimal use of income for consumption. He drew an interesting distinction between comforts, that become noticeable only when they are withdrawn, and pleasures—that are noticeable by definition. An essential condition for pleasure, in Scitovsky's analysis, is contrast with respect to a norm. Feasts, vacations, and gifts are typical occasions for pleasure. Note that the occasion need not be unexpected—deviation from routine suffices. Scitovsky went on to present a rather jaundiced view of the American culture of consumption that appears to favor comforts over pleasures to a greater extent than many others. A significant aspect of the contrast between American and European patterns of consumption involves vacations, that are longer, more elaborate and relatively more costly in Europe. Scitovsky's argument (quite similar to ours above) is that there is a significant sense in which money expended on pleasures is better spent than money spent on comforts. We conjecture that substantial lump sum payments in December and in July would increase spending on pleasures.

Certain bonuses are also likely to increase saving. (There is no inconsistency here. Both pleasurable consumption and saving can increase if routine expenditures decrease. We are predicting that workers would save and splurge more at the expense of a slightly reduced normal standard of living.) A theoretical analysis based on the self-control aspects of saving is provided in Hersh Shefrin and Thaler (1988). They point out that individuals take actions to create their own lumpy payments. For example, a large majority of tax payers receive refunds, thereby giving the IRS an interest-free loan. Empirical support for the effect of bonuses on saving is presented in Tsuneo Ishikawa and Kazuo Ueda (1984). They estimated that in Japan, where most workers receive bonuses twice a year, the marginal propensity to consume bonus income is .437 compared to .685 for regular income. They also separated bonuses into anticipated and unanticipated components, and observed the same marginal propensity to consume from each.

III. Advantages to the Firm

We now turn to possible consequences of our sample proposal for the employing firm. We again concentrate our attention on arguments that would not generally receive much attention from the economics commu-
nity. The topics we consider are stimulating cooperation and increasing wage flexibility.

**Stimulating Cooperation.** The standard reaction by economists to the alleged incentive effects of profit-sharing schemes is to raise the so-called $1/N$ problem. In a large firm, a worker gets only a trivial portion of any increase in firm profits that he or she may produce, so the incentive to free ride will be strong. While it is possible to construct repeated play economic models in which cooperation is optimal, we agree with David Card's assessment: "I remain sceptical that simple economic models of individual self-interest can usually explain the effects of profit sharing" (1990, p. 140). Of course, the fact that economic theory predicts that profit sharing will have trivial incentive effects does not make it true. This prediction is much like other predictions of free riding. Yet we know that millions of people vote, clean up campgrounds, and donate to public television and other charities. Cooperation in public goods and prisoner's dilemma situations has also been extensively studied in the laboratory by social psychologists and experimental economists in recent years. Two main conclusions emerge from this research (summarized in Robyn Dawes and Thaler, 1988). First, cooperation is common even when the dominant strategy is to defect or free ride. Second, creating a group identity (such as by allowing the members of a group to talk to one another before making anonymous choices) fosters cooperation. It strikes us as plausible that profit-sharing plans can also contribute to the sense of solidarity that would improve worker performance. The empirical evidence gives some support to this view (see Edward Lawler, 1981, and the studies in Alan Blinder, 1990, and Ronald Ehrenberg, 1990).

**Fairness and Wage Flexibility.** One of the advantages of a Japanese-style bonus plan that Martin Weitzman (1984) has stressed is to create more flexibility in compensation policies and thereby reduce unemployment rates in recessions. Indeed, Richard Freeman and Weitzman (1987) do find that in Japan bonuses are more variable than base pay, and are also more highly correlated with profits. From a theoretical perspective, it is hard to understand why this should be true. Put another way, why is it necessary to call some of the annual compensation a bonus to achieve greater flexibility? Why should this labeling matter?

Some of our research on perceptions of fairness, done in collaboration with Jack Knetsch (Kahneman et al., 1986), provides a possible answer. Respondents to a telephone survey were asked a series of questions about the perceived fairness of various pricing and wage-setting actions by firms. Three of our findings are germane to the issue of bonuses. 1) Pay cuts by profitable firms even in labor markets with high unemployment are judged to be very unfair. 2) Pay cuts that are occasioned by a deterioration in the competitive position of the employing firm are considered acceptable. 3) Cuts in remuneration are much more likely to be considered fair if they are described as the elimination of bonuses rather than as reductions in the regular wage rate.

The practical suggestion that emerges from this work is that the principle of wage flexibility will be most easily accepted by labor in a context of a gain- (and risk) sharing plan that uses periodic bonuses. If it became policy to encourage a move toward what Weitzman calls a share economy, this bit of psychological wisdom could become useful.

**IV. Other Applications: Age Earnings Profiles**

Many of the same psychological principles that we have used to argue for bonuses can also be used to explain the anomalous pattern of wages over the life cycle. Several authors have observed that while productivity typically peaks well before retirement, compensation often rises monotonically with age until retirement. Academic salaries are surely a case in point. Edward Lazear (1981) has argued that firms adopt this pattern to reduce shirking by older workers, but Robert Frank and Robert Hutchens (1990) find that the same pattern is observed for airline pilots, where agency problems would seem to be minimal. Frank-Hutchens and Loewenstein and Nachum Sicherman (1991)
both argue that the rising wage profile is better explained by worker preferences.

Adaptation, loss aversion, and self-control are important factors that help explain why workers prefer rising wage profiles. Because workers adapt to current levels of wages, and are particularly sensitive to reductions in their standard of living, a hump-shaped pattern mimicking productivity has obvious drawbacks. The modest positive slope actually observed in real terms, plus the nominal increases necessary to keep up with inflation, can also go a small way toward mitigating the hedonic treadmill. The costs of self-control must be invoked to explain why workers can’t transform a hump-shaped wage profile into an increasing consumption profile.

V. Conclusions

Our discussion of the benefits of a bonus system to the workers has been deliberately provocative, raising points that are likely to appear bizarre to many economists, who are accustomed to think within the standard rational model. Our point, of course, is that this may not be the only way to think—and perhaps not even the best. We have made or implied the following assertions: (i) that spending habits will be affected by the temporal distribution of income flows, even when the timing and size of the variations in these flows are largely predictable; (ii) that people will have a preference for a moderate amount of lumpiness; (iii) that people may not be able to pick out the pattern of consumption that would maximize their “real” utility; they may both need and want help in this task.

A possible objection to the arguments we have raised is a familiar one: if a system of bonuses is so good, how come more firms do not use it? In Weitzman’s book about the share economy, he responds to this question in part with a joke. How many economists does it take to screw in a light bulb? None. If it were a good idea to screw in the light bulb, someone would already have done it. While many other serious answers can be offered, including cultural and institutional factors, a deeper point may have to do with the nature of maximizing. It is readily conceivable that a firm may have achieved a local maximum, such that any small adjustment that it makes will be detrimental. This does not imply, however, that there is no larger move that would get to a higher elevation. Consideration of the range of possible organizations of labor and pay suggests that the profit-maximizing firms of the standard model could well be trapped (even if completely successful at the game they are playing) at the peaks of rather lowly hills. This possibility is underscored by the fact that firms in other countries have successfully adopted the system under consideration.

REFERENCES

Freeman, Richard and Weitzman, Martin, “Bonuses and Employment in Japan,”


