Happiness, Adaptation, and Decreasing Marginal Utility of Income

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Abstract

Happiness studies both support and question diminishing marginal utility of income. Cross-sectional studies support the proposition that marginal utility of income declines with income, but longitudinal studies indicate that marginal utility of income is zero once basic needs are met. Adaptation to income increases has been used to reconcile these two empirical results. This seems to suggest that the marginal utility of income decreases in the short run, but not in the long run, over a wide range of income in wealthy countries. Making use of loss aversion, however, it is shown that income transfers from the rich to the poor are likely to reduce total utility in the short run while having no long-run effect.

I. Introduction

It has long been argued that transferring income from the rich to the poor increases total utility (or happiness) because of decreasing marginal utility of income. Of course, before income equality is achieved, further transfers reduce income growth by enough to offset any additional utility gain from reducing further the marginal utility gap between the rich and poor.[1] The proposition that a poor person receives a larger utility gain from an additional dollar than a rich one is intuitively plausible. Yet, the rapidly expanding happiness research initiated by Easterlin (1974) finds empirical patterns that both

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[1] For examples, see Breit and Culberson (1970) and Mirrelles (1971).

support and question the view that the marginal utility of income decreases as income increases. Cross-sectional data, both within and across particular countries, support decreasing marginal utility of income—in the short run there is a positive, but diminishing, relationship between income and happiness. On the other hand, time-series data from a number of countries show that increased income within countries has no noticeable long-run effect on average happiness or utility. This has become known as the Easterlin paradox.

Despite this ambiguity between the short- and long-run effects on the marginal utility of income, some scholars have not hesitated to use happiness studies to support income transfers from the richer to poorer as a way of increasing total utility. For example, Layard (2005, p.52) states, "if money is transferred from a richer person to a poorer person, the poor person gains more happiness that the rich person loses. So average happiness increases."[2] And according to Griffith (2004, p.1363), "[s]tudies show the level of inequality in a society also may affect levels of happiness. Ultimately, happiness research is consistent with the strongest justification for adopting a progressive tax structure—income has declining marginal utility, thus redistribution can increase total welfare in a society." On the other hand, based on the time-series evidence, Easterlin (2005, p.252) puts forth for consideration the proposition that over the long run, "[i]nstead of diminishing marginal utility of income, there is zero marginal utility."

In this paper I incorporate a finding by behavioral economists on loss aversion into a consideration of the short- and long-run effects of income on happiness. I reach the rather surprising conclusion that the diminishing marginal utility argument for reducing income inequality is weaker in the short run than in the long run. Indeed, it possible that the short-run happiness losses to those with higher incomes exceed the short-run happiness gains to those with lower incomes when money is transferred from the former to the latter.[3]

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[2] I shall follow the practice of those who write on the economics of happiness by using the terms utility and happiness synonymously. See footnote 6.

[3] I ignore the "leaky bucket" concern discussed by Okun (1975). I assume throughout that all the money taken the wealthy for transfers goes to the relatively poor and that there are no adverse incentive effects on productivity caused by the transfers. Though unrealistic, these assumptions focus attention on the marginal utility effects of transfers from those with higher income to those with lower

In the next section I discuss briefly how adaptation has been used to reconcile the difference in the cross-sectional and time-series data from the happiness literature and how income becomes less useful as a proxy for happiness as a country becomes wealthier. This leads into the primary purpose of the paper in Section III, where I incorporate adaptation and loss aversion (or endowment effect) into a simple diagram to demonstrate that the possibility of improving happiness, even in the short run, with income transfers is more limited than commonly believed. Concluding comments are offered in Section IV.

II. Income Growth, Adaptation, and Happiness

Increased income clearly increases happiness in the short run. And there is no reason to doubt that the marginal increase is greater for those with lower incomes than for those with higher incomes. But the happiness resulting from any acquisition is subject to erosion as people begin adapting to it. Psychologists point out that even when people respond with great happiness to something when initially acquired, it soon begins receding into the background of their consciousness and eventually becomes largely taken for granted. As stated by psychologist Seligman (2002, p.105), "This process, called habituation or adaptation, is an inviolable neurological fact of life. Neurons are wired to respond to novel events, and not to fire if the events do not provide new information." When an income increase, and the additional consumption it makes possible, is new information, it is clearly a source of increased happiness. But as the additional income becomes old information (as we adapt to it), its ability to continue activating our sensory awareness and keeping us on an elevated level of happiness diminishes, and we are eventually no happier than we were before.

Di Tella, Haisken-De New, and MacCulloch (2007) recently considered empirically whether adaption is sufficient to explain the Easterlin paradox. To do so they consider how completely people adapt to income changes. On the basis of individual-level panel data from Germany between 1984 and 2000, they find (p.2) that "adaptation is sufficiently large that no significant income effects on happiness remain after the fourth year," and (p.19) that their "estimates of adaptation [to income] are sufficiently large so as to be

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incomes. I also assume that the rich and the poor have the same utility function, ruling out the possibility that the rich value the receipt of an additional dollar more than do the poor because of differences in utility functions.

able to explain why no long-run trend in happiness is observable over several decades."

This suggests that income is not a good proxy for long-run happiness. And there are reasons for believing it becomes less so as a country becomes wealthier. One reason is that the wealthier a country is, the more available are the goods that satisfy basic needs to almost all income groups. For example, during the eighteenth century an important difference between the rich and poor was that the rich survived famines whereas many of the poor did not. In an increasing number of countries today, the poor are more likely to be obese than the rich. Two hundred years ago, the rich rode in covered and cushioned carriages pulled by teams of horses, whereas the poor walked in a primitive pair of shoes. Today the rich travel in a new luxury car, whereas the poor travel just as quickly and comfortably in a used car. In the past the rich had reasonably clean clothing, fitted and styled to communicate their high social status, whereas the poor wore dirty, ragged, ill-fitting clothing that communicated a markedly lower social status. Today the rich have their clothing custom tailored, or buy clothes at fashionable boutiques or upscale department stores, whereas the poor buy their clothing, similarly styled, in discount stores or outlets. In the eighteenth century the rich had fancy pocket watches that served as both fashionable jewelry and as instruments for telling time, whereas the poor relied on the position of the sun to get a rough approximation of the time. Today the rich wear expensive gold watches with impressively engineered self-winding mechanisms, whereas the poor wear more accurate electronic watches they buy for a few dollars. Nye (2002a) provides additional examples of the declining importance of the difference in the products bought by the rich and the poor to human well-being.

Another related reason why money has become less important as a proxy for happiness is that the wealthy spend much of their money on positional goods in a zero-sum competition for social status. Frank (1999, Chapters 1, 2) gives examples of the rich spending large amounts on products such as $14,000 handbags; diamond studded bras selling for $1 million; and yacht barstools covered with the extremely soft, but outrageously expensive, foreskin from a sperm whale's penis. Frank (1999, p.65) sees such expenditures as wasteful and as a justification for a highly progressive tax structure. Nye (2002b) objects to such a tax structure because "the spending by the wealthy on many positional goods acts as a curious sort of natural

taxation. The richest (or most ambitious) must work harder and pay more for virtually the same goods as yesteryear while their productive investments (necessary to stay on top of the income distribution) benefit the entire economy." But both Frank and Nye agree that such position goods add only temporary happiness to those buying them

The implication is that as a country becomes wealthier, the happiness gap separating the poor from the rich becomes smaller, as the poor increasingly acquire products providing the same basic comforts and conveniences as those with more frills that the rich buy at far higher prices. This conclusion is consistent with, and could provide a partial explanation for, the finding by Stevenson and Wolfers (2008) that over the period 1972–2006 happiness inequality in the United States decreased despite increased income inequality over the same period. Stevenson and Wolfers (2008, p.10) "find only a mild negative trend in average happiness, but a clear decline in happiness inequality, with a turning point registered in about the late-1980s, and only a gradual increase in the subsequent years. By any measure, happiness inequality in the first one-third of our sample period is higher than in the final third."

III. Short-Run Deviations from Long-Run Happiness

Accepting the view that in the short run happiness increases at a decreasing rate as income increases, but is not affected by income changes in the long run, I now introduce *loss aversion* to argue that transferring income from the rich to the poor is, *in the short run*, likely to reduce the happiness of the wealthy by more than it increases the happiness of the poor.

My argument begins with the long-run happiness curve (LRH) in Figure 1, which is a stylized illustration of average happiness remaining constant as average per-capita income increases in industrialized countries such as Japan, the United States, and those in Western Europe. This curve rules out long-run gains in happiness from programs transferring income from those with high incomes to those with low incomes.[4] Of course, the short-run marginal utility of income is decreasing, and this is represented by the short-run happiness (SRH) lines intersecting the LRH in Figure 1; the slope of

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[4] A small percentage of the population in even wealthy countries could be so chronically poor that income transfers would make them permanently happier. With them in mind, the horizontal LRH line is shown to begin at a positive per-capita income.

these lines above the LRH becomes smaller, as they originate at higher income levels.
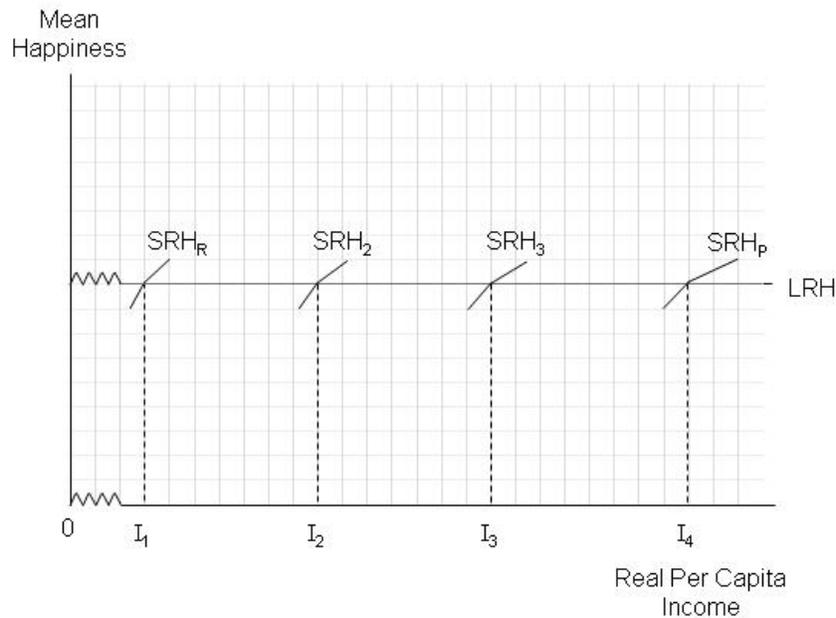

Figure 1: Short-run deviations from long-run happiness.

Notice, however, that there is a kink in the SRH lines when they cross the LRH; they become steeper below the LRH than above it. Experiments by behavioral economists have consistently found the existence of "loss aversion" (or an endowment effect), which implies that the direction of an income change affects its short-run effect on happiness. Loss aversion refers to people suffering more from the loss of something they own than they benefit from acquiring it, with experimental evidence—see Kahneman, Knetsch and Thaler (1990) and Kahneman and Tversky (1979)—indicating that the value of the loss is about twice as large as that of the gain. With this evidence in mind, the slopes of the SRH lines below the LRH are shown to be twice as steep below the LRH as above it.[5]

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[5] The SRH lines are shown as straight because I am only interested in marginal changes from a particular income level. Vendrik and Woltjer (2007) have empirically estimated the curvature of short-run marginal utility of income curves for both income increases and decreases. As opposed to Kahneman and Tversky

For diminishing marginal utility of income to justify an income transfer, assuming a short-run perspective, the short-run happiness loss to the person losing the income must be less than the short-run happiness gain to the person receiving it.[6] This condition is satisfied in Figure 1 only when the slope of the below-the-kink SRH line for the payer is less than the slope of the above-the-kink SRH line for the recipient. As Figure 1 is constructed, the below-the-kink slope of SRH_P is exactly the same as the above-the-kink slope of SRH_R, so a transfer from a payer with income I_4 to a recipient with income I_1 would leave average happiness unchanged in both the short and long run. Because the slopes of the SRH curves are smaller the larger the incomes from which they emanate, any transfer from a payer to a recipient with incomes within the range (I_1, I_4) will reduce average short-run happiness. For example, transferring income from someone with income I_4 to someone with income I_2, or from someone with income I_3 to someone with income I_1, would reduce average short-run happiness. Any transfer to someone in the income range (I_1, I_4) would have to come from someone with an income higher than I_4 to increase short-run happiness, with the amount above I_4 depending on where in the income range (I_1, I_4) the recipient is located. Any transfer from someone in the income range (I_1, I_4) would have to go to someone with an income lower than I_1 to increase short-run happiness, with the amount below I_1 depending on where in the income range the payer is located.[7]

(1979), who maintain that those marginal utility curves are concave for income increases and convex for income decreases, Vendrik and Woltjer find that they are concave for both increases and decreases in income, reflecting accelerating loss aversion.

[6] This statement assumes that it is reasonable to make interpersonal comparisons of utility, comparisons that ignore the subjective nature of utility. Though it is widely accepted by economists that such interpersonal comparisons are unreasonable, this unreasonableness is commonly ignored—see Stringham (2010). Given that the problems with making interpersonal comparisons of utility are clearly being ignored by those using diminishing marginal utility of income to argue for income transfers from the rich to the poor, I feel justified in making the same comparisons in pointing out a flaw in their argument.

[7] Loss aversion has been used to provide theoretical support for empirical results that are at variance with conventional theoretical models. In a recent paper Easterlin and Angelescu (2010) make use of loss aversion to explain why happiness and income are not positively related in the long run even though they are in the short run. On another topic, Freund and Ozden (2008) use loss aversion to develop a trade protection model that generates implications consistent with

Actually, the transfers that increase short-run happiness are even more limited than is seen directly from Figure 1. Because of adaptation, once a person moves up or down their SRH line in response to receiving or paying for an income transfer, their line will begin a clockwise pivot around their initial income level until it becomes coincident with the LRH line. An important question in determining if an income transfer adds more to short-run happiness than it subtracts is, how long does it take for adaptation to eliminate both the happiness increase and the happiness decrease? Psychologists have provided a convincing answer to this question. According to Haidt (2006, p.29), "Over and over again, psychologists find that the human mind reacts to bad things more quickly, strongly, and *persistently* than to equivalent good things" (emphasis added).[8] So even if an income transfer decreases the short-run happiness of the payer by less than it increases the short-run happiness of the recipient, it may still be unjustified on marginal utility grounds because the short-run loss in happiness for the payer lasts longer than the short-run gain in happiness for the recipient.

The short-run result obtained here can be qualified in one important way. If the transfer is anticipated by both the payer and the recipient, the adaptation to the loss and gain begins as soon as the new information is received, with the speed of the adaptation being faster the more confidence there is that the anticipated transfer will occur. So it is possible that when the transfer actually happens, there will be no noticeable effect on the happiness of either the payer or the recipient.[9] And, of course, if a transfer is not a one-time event, but regularly paid through a tax deduction and regularly received, then adaptation eventually results in all affected parties being on the LRH line.

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empirical observations showing that declining rather than expanding industries are more likely to receive trade protection; an observation that is inconsistent with the implications of standard trade protection models.

[8] Haidt (2006, p.29) explains the experimental evidence from the perspective of evolutionary psychology. As he states, "[i]f you were designing the mind of a fish, would you have it respond as strongly to opportunities as to threats? No way. The costs of missing a cue that signals food is low; . . . odds are . . ., [that] one mistake won't lead to starvation. The cost of missing the sign of a nearby predator, however, can be catastrophic. Game over, end of the line for those genes."

[9] For a model that, among other things, considers the effect of anticipation on the adaptation to an anticipated event, see Lee (2009).

IV. Conclusion

Evidence from happiness studies indicate that happiness is elevated at a decreasing rate by income in the short run, but not noticeably affected by increased income in the long run. This provides support for diminishing marginal utility of income as a short-run phenomenon, but not one that holds in the long run. The policy implication would seem to be that income transfers from those with higher incomes to those with lower incomes increases happiness initially, but not in the long run. But even this partial support for diminishing marginal utility of income as a justification for income transfers is largely undermined if we accept the evidence on loss aversion from behavioral economists.

Because of "loss aversion" the happiness decline an individual experiences when he loses a dollar is greater than his happiness increase from gaining a dollar—about two times greater according to experiments by psychologists and behavioral economists. This means that even if the marginal gain and loss in utility diminish in income, the gains to lower income transfer recipients may be less than the losses to higher income transfer payers, over a wide range of incomes. This leaves us with the possibility that most of the money transferred by government from those with higher to those with lower incomes is reducing happiness in the short run and leaving it unchanged in the long run. Certainly it is difficult to take happiness research and experiments on loss aversion seriously while remaining convinced that diminishing marginal utility of income provides a solid justification for government transfers.

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