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Diminishing Marginal Utility of Income? A  
Caveat

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# Diminishing Marginal Utility of Income? A Caveat

Richard A. Easterlin

## Abstract

Few generalizations in the social sciences enjoy such wide-ranging support as that of diminishing marginal utility of income. Put simply, this proposition states that the effect on subjective well-being of a \$1,000 increase in income becomes progressively smaller the higher the initial level of income. Distinguished scholars in economics, political science, psychology, and sociology who have made major contributions to the study of subjective well-being concur on this assertion. Its policy appeal is great because it implies that raising the income of poor people or poor countries will raise their well-being considerably, while an increase of equal amount for the rich will have comparatively little effect. The diminishing returns generalization is based on point-of-time bivariate comparisons of happiness with real income, either among or within countries. If, as these cross sectional studies suggest, there is diminishing marginal utility of income, then this point-of-time pattern should be replicated over time as income traverses the range of values covered in the cross sectional analysis. I propose to test whether historical experience reproduces the point-of-time relationship, first, using an international cross section of happiness and income, and then, a within-country one for the United States. As in the studies cited, I use a simple bivariate comparison. It turns out that income change over time does not generate the change in happiness implied by the cross sectional pattern. The present analysis is not exhaustive, but it does suggest the need for caution in assuming that cross sectional generalizations about diminishing marginal utility of income can be safely used to anticipate change over time.

## Diminishing Marginal Utility of Income? A Caveat

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Few generalizations in the social sciences enjoy such wide-ranging support as that of diminishing marginal utility of income. Put simply, this proposition states that the effect on subjective well-being of a \$1,000 increase in income becomes progressively smaller the higher the initial level of income. Distinguished scholars in economics, political science, psychology, and sociology who have made major contributions to the study of subjective well-being concur on this assertion.<sup>1</sup> Its policy appeal is great, because it implies that raising the income of poor people or poor countries will raise their well-being considerably, while an increase of equal amount for the rich will have comparatively little effect.<sup>2</sup>

The diminishing returns generalization is based on point-of-time bivariate comparisons of happiness with real income, either among or within countries. If, as these cross sectional studies suggest, there is diminishing marginal utility of income, then this point-of-time pattern should be replicated over time as income traverses the range of values covered in the cross sectional analysis.<sup>3</sup> I propose to test whether historical experience reproduces the point-of-time relationship, first, using an international cross section of happiness and income, and, then, a within-country one for the United States.

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<sup>1</sup> For economics, see Frank 1997, p. 83; Frey and Stutzer 2002a, p. 90; Graham and Pettinato 2002, pp. 19-20; political science, Inglehart 1997, pp. 61-62, 2000, pp. 217-219; Lane 2000, p. 106; psychology, Argyle 1999, p. 356; Diener et al. 1993, pp. 204-205; sociology, Inkeles 1993, p. 15; Veenhoven 1991, pp. 10-11.

<sup>2</sup> Whether the effect for the rich will be slightly positive, zero, or negative is a matter on which opinions differ. Compare Diener et al. 1993, p. 205; Inglehart 1997, pp. 61-62; and Frey and Stutzer 2002a, pp. 83-85.

<sup>3</sup> Frey and Stutzer (2002b, pp. 408 – 418) distinguish between the cross sectional and time series relation of happiness to income.

As in the studies cited, I use a simple bivariate comparison. It turns out that income change over time does not generate the change in happiness implied by the cross sectional pattern. The present analysis is not exhaustive, but it does suggest the need for caution in assuming that cross sectional generalizations about diminishing marginal utility of income can be safely used to anticipate change over time.

### Results

Among countries – For the international comparison I draw on an analysis in which the author demonstrates the diminishing returns relationship by fitting two parallel curves to a scattergram for 14 countries, ranging in level of economic development from Nigeria to the United States (see Figure 1, reproduced from Veenhoven 1991).<sup>4</sup> I choose this 1991 study because the point-of-time data are for the early 1960s, and this makes it possible to see how well the subsequent experience of one of the low income countries, Japan, fits the happiness-income relationship implied by the 1960s cross section. Japan, marked in Figure 1 by an asterisk, is the only low income country in the study for which lengthy and reasonably reliable time series data are available.

Between 1962 and 1987 Japan experienced unprecedented economic growth, with real GDP per capita multiplying by 3.5-fold, and rising from 22 to 77 percent of the United States level in 1962. If, with this income growth, Japan had followed the trajectory suggested by the curves fitted to the 1960s cross section, then happiness would

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<sup>4</sup> In the original article, there are no equations given for the curves and no explanation of how they are fitted to the data. I reproduced them here by reading the coordinates of the curves from the figure in the published article. I did this also for the individual country data points, because they are not the same as those in the data source cited for the figure (compare Exhibit I, figures a and b in Veenhoven 1991, p. 11).

have risen from a mean value of 6.5 in 1962 to 7.7 in 1987 (Figure 2).<sup>5</sup> Is this what actually happened?

The answer is no, happiness remained constant despite Japan's remarkable economic growth. There is no significant slope to a regression line of happiness on income fitted to yearly data spanning 1958 to 1987 (Figure 3).<sup>6</sup> Note that Japan starts in the late 1950s slightly above the *upper* curve, then crosses both curves, and ends up considerably below the *lower* curve. Clearly the inference of growing happiness at a diminishing rate suggested by the curves fitted to the 1960s cross section is not replicated over time. There was not diminishing marginal utility of income, but zero marginal utility over the entire period.

Within-country – In the United States at any point-in-time, happiness is greater, on average, the higher the level of real per capita income, but the increase in happiness for each \$1,000 increment in income becomes progressively smaller (Figure 4). This pattern of diminishing marginal utility of income, illustrated in the figure by the fitted logarithmic curve, is found in every year for which there are nationally representative survey data.<sup>7</sup> I use 1994 here because the number of observations is greater, and the income span, wider than in earlier years.

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<sup>5</sup> To obtain the absolute values of GNP per capita used in Figures 2 and 3, and of happiness in Figure 3, the procedure was as follows: Annual indexes (1962=100) of life satisfaction and real GNP per capita for Japan, 1958-1987, were computed from Veenhoven 1993, pp. 176-177, and Summers and Heston 1991. The 1962 values of happiness and GNP per capita read from Veenhoven 1991, p. 11 were then multiplied by the index value for each year (divided by 100).

<sup>6</sup> The equation (t-stat in parentheses) for the regression line in Figure 3 is:

$$H = 0.0692 \ln(Y) + 5.9331,$$

(1.0924)            (11.7728)

where H = mean happiness, Y = real GNP per capita. Adj. R<sup>2</sup> = .042

<sup>7</sup> The equation (t-stat in parentheses) for the cross sectional regression curve in Figures 4-6 is:

$$H = 1.255 \ln(Y) + 0.9804. \text{ Adj. R}^2 = .917$$

(10.0259)            (8.2516)

In 1972, the first year for which continuously comparable annual survey data are available, persons born between 1941 and 1950 had a mean per capita income, expressed in dollars of 1994 purchasing power of about \$12,000. By the year 2000, their average income had more than doubled, rising to almost \$27,000. Based on the cross sectional relationship, this increase in income should have raised their mean happiness from 2.17 to 2.27, where happiness is scaled from very happy = 3 to not very happy = 1 (Figure 5). Did this increase really occur?

Again, the answer is no. There is no significant slope to a regression line fitted to annual data for happiness and income from 1972 to 2000 (Figure 6).<sup>8</sup> On average, the happiness of persons born between 1941 and 1950 was constant throughout this 28-year segment of their adult life span. The constancy of happiness as income grows holds for other birth cohorts as well (Easterlin 2001, Figure 1). The life cycle experience of cohorts within a country does not replicate the diminishing returns pattern of cross sectional analysis; instead, happiness, on average, is constant, even when income increases substantially.

### Summary

In both the within-country and among-country analyses here, as income increases within the range covered in the cross sectional analysis, happiness fails to reproduce over time its point-of-time relationship to income. There is not diminishing marginal utility of income, but zero marginal utility.

<sup>8</sup> The equation (t-stat in parentheses) for the cohort regression line in Figure 6 is:  
 $H = 0.0060 \ln(Y) + 2.1456$ . Adj.  $R^2 = -.047$   
 (0.1355) (4.9828)

The generalization about diminishing marginal utility of income found in the literature is based on simple bivariate comparisons of happiness with income at a point in time. Although a number of life circumstances that influence happiness, such as marital status, employment status, and health, vary by level of income at a point in time, the pattern of diminishing marginal utility prevails in the simple bivariate comparison. It seems appropriate, therefore, to test the cross sectional generalization with a similar bivariate time series analysis, as has been done here. The cross sectional analyses are often taken to imply that happiness will increase substantially as income rises over time from fairly low initial levels. In the cases examined here, however, this cross sectional relationship does not foreshadow time series experience, and well-being fails to increase with income.

My interest here is in demonstrating the disjuncture between cross sectional and time series experience. I have suggested elsewhere the possible causes of this inconsistency (Easterlin 2001). Let me be clear that I am not saying that happiness is a constant, given by genetics and personality.<sup>9</sup> Nor am I saying that individual or social action aimed at increasing happiness is fruitless (Easterlin 2003 forthcoming). My point is a simple one; on the subject of diminishing marginal utility of income, the cross sectional relationship is not a trustworthy guide to experience over time or to inferences about policy.

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<sup>9</sup> For cases in which happiness has increased or decreased over time as income changes see Easterlin 1974, pp. 110-111, 1995, pp. 38-39.

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Figure 1. Happiness and Per Capita Income, 14 Countries , Early 1960s

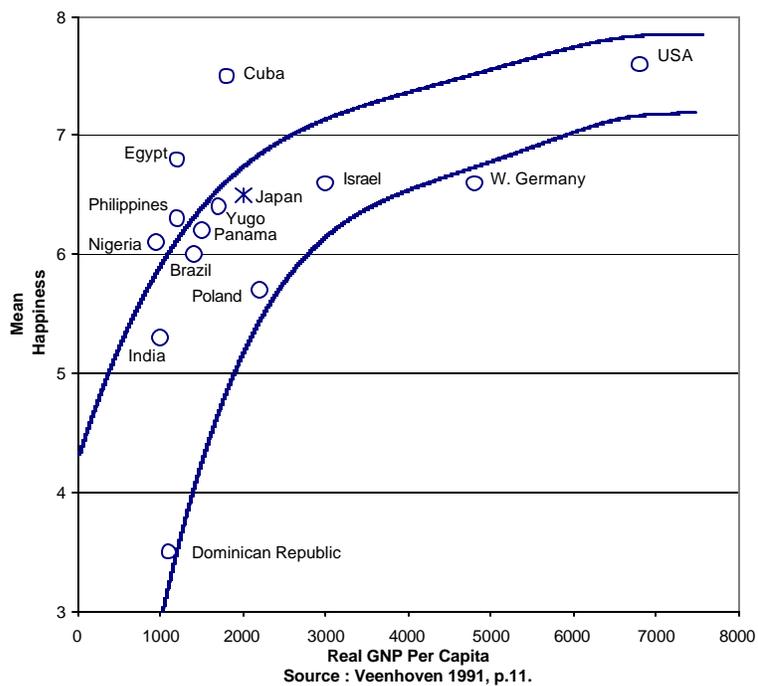


Figure 2. Predicted Happiness in Japan in 1987, Based on 1960s Cross Section

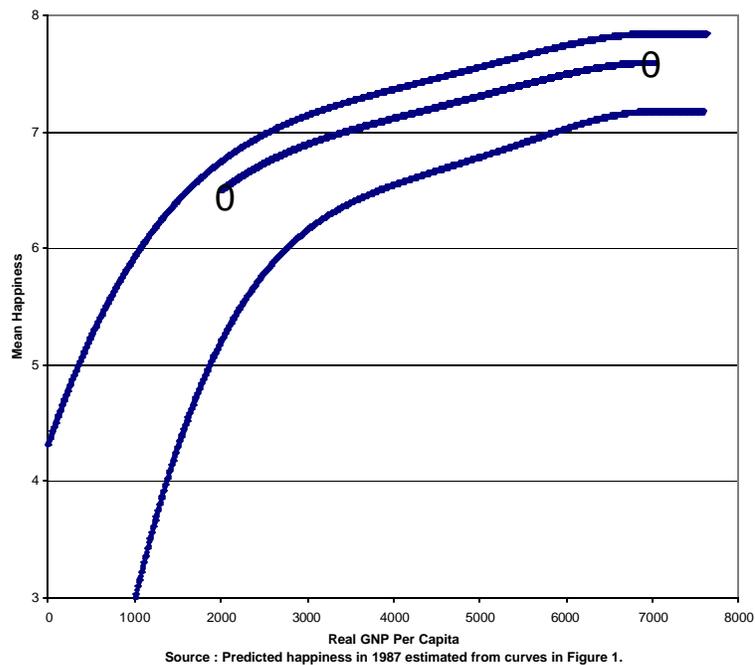


Figure 3. Actual Happiness in Japan, 1958-1987

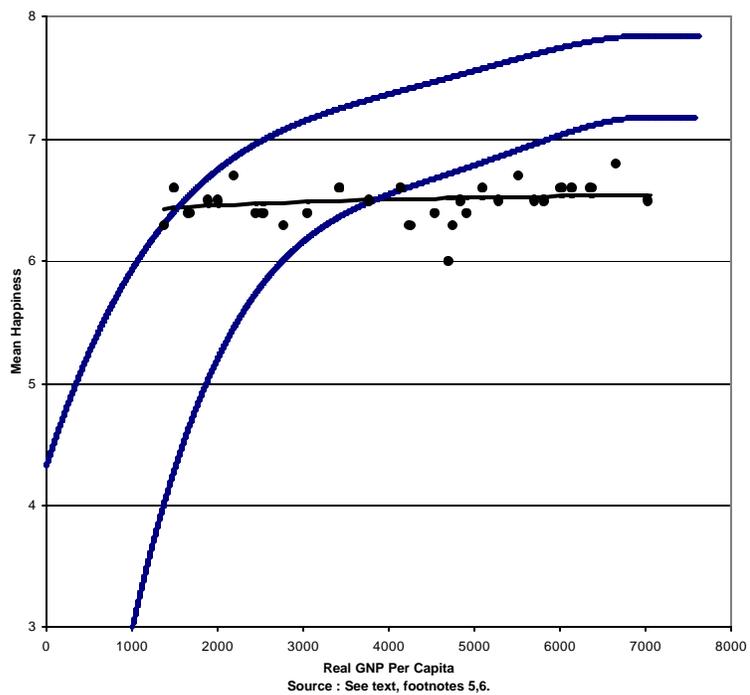


Figure 4. Happiness and Per Capita Income, United States, 1994

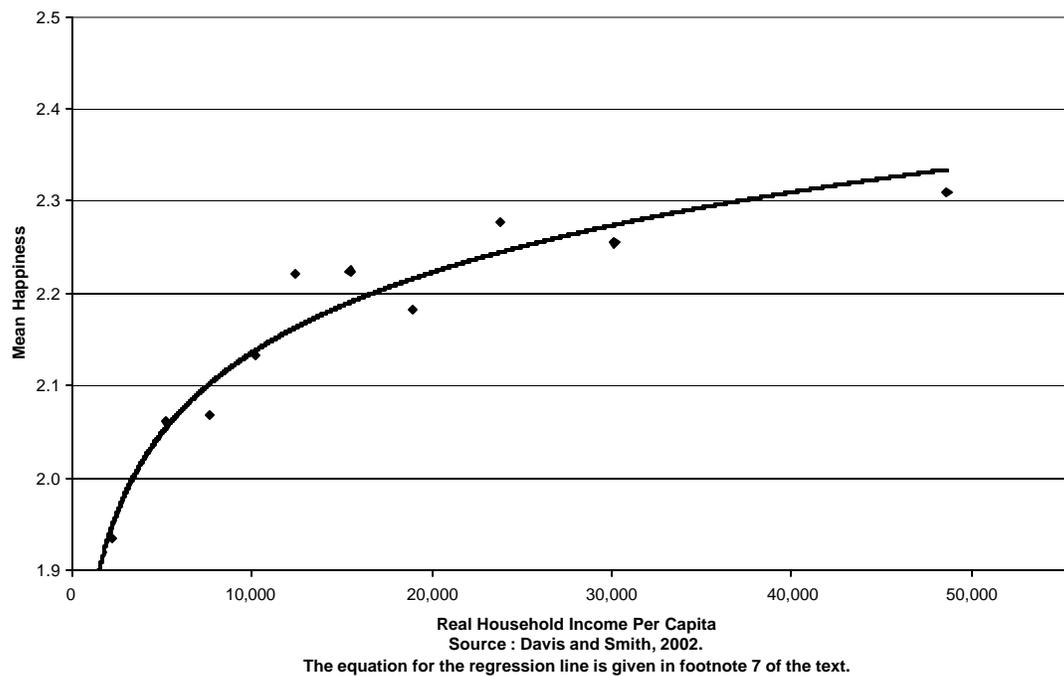


Figure 5. Predicted Happiness of Birth Cohort of 1941-50 in 1972 and 2000, Based on 1994 Cross Section

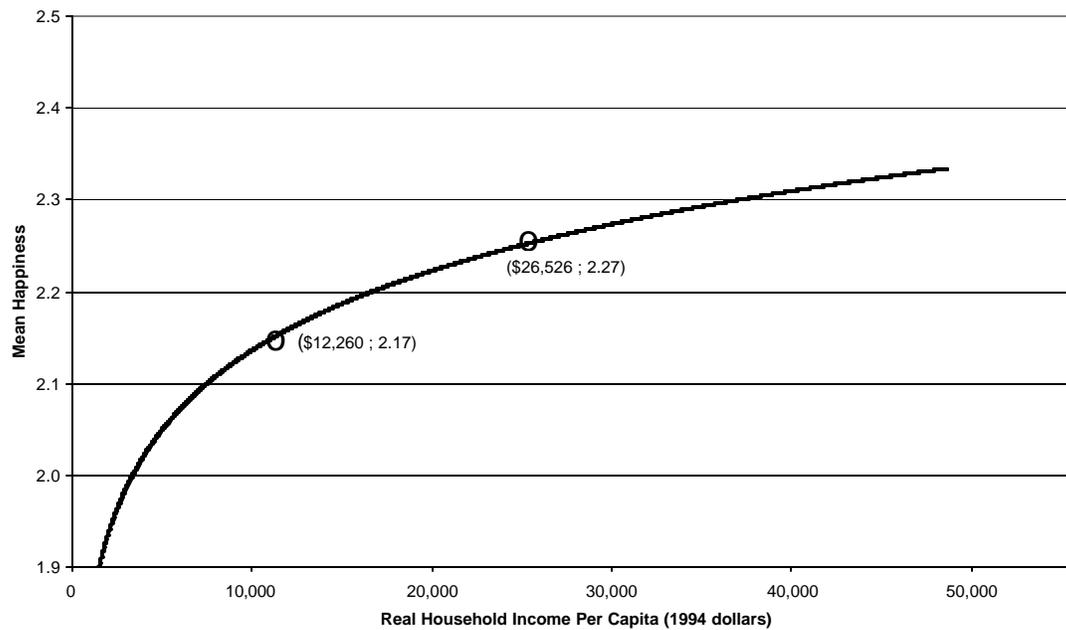


Figure 6. Actual Happiness of Birth Cohort of 1941-1950, 1972-2000

