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RESEARCH ARTICLE

Income growth and happiness: reassessment of the Easterlin Paradox

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Abstract The paper presents evidence of a positive but very small long-run relationship between income growth and happiness. Such finding is usually presented as a refutation of the Easterlin Paradox. The paper, however, argues that what the evidence actually reveals is that income growth has very little impact in terms of increasing happiness over the long term. The paper, in turn, argues that a rejection of the Easterlin Paradox requires the evidence to indicate economic significance. That is, the magnitude of the estimated long-run relationship between income growth and happiness is the more appropriate yardstick for an evaluation of the Easterlin Paradox.

Keywords Easterlin Paradox · Income growth · Happiness · Dynamics

JEL Classification A20 · C53 · I30 · O40

1 Introduction

This paper is yet another intervention to the continuing debate on the Easterlin Paradox. Simply put, the paradox is about a contradiction between the short-run evidence of a positive income–happiness relationship and the long-run evidence of a zero income–happiness relationship. This scenario is a paradox because it goes against the standard view that a positive income–happiness relationship exists regardless of the time perspective in the analysis.

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Briefly, a summary of the debate includes the following observations. First, Easterlin (1974, 1995, 2001) argues that hedonic adaptation to income and social comparison in income operate to cancel out any short-run impact of income growth on happiness and/or make happiness revert to its long-run level notwithstanding the presence of income growth. The argument does not really say that income growth cannot affect happiness at all, but, rather, any effect can only take place under the restrictive assumption of *ceteris paribus*. More recently, Easterlin et al. (2012; see also Knight and Gunatilaka 2011, 2012) add that robust income growth that spans for many years like the experience of China is not even enough to offset the impact of hedonic adaptation and social comparison in keeping happiness steady in the long term.

Second, the "Stevenson–Wolfers group" (i.e., among others, Deaton 2008; Inglehart et al. 2008; Stevenson and Wolfers 2008; Sacks et al. 2012; Diener et al. 2013; and Veenhoven and Vergunst 2014) presents evidence that refutes the findings of the "Easterlin group" (i.e., Easterlin 1974, 1995, 2001, 2013; Easterlin and Angelescu 2009; Easterlin and Sawangfa 2010; Easterlin et al. 2010). In particular, Stevenson and Wolfers (2008) point out that a statistically not significant association between income growth and happiness is not the same as an absence of a relationship between the two variables, as hinted by the Easterlin group. They then go on to present evidence that both the short-run and long-run relationships between income growth and happiness are indeed statistically positive. In fact, they also state that the long-run evidence is not statistically different from the short-run evidence. In turn, Easterlin (2013), for instance, counters by saying that what the Stevenson–Wolfers group ends up estimating is merely a short-run relationship between income growth and happiness, and, as such, what they are presenting is evidence that does not invalidate the paradox.[1]

Third, the two sides of the debate differ in the generality of the purported absence or presence of the long-run income–happiness relationship. On the one hand, the Easterlin group argues that the absence of such a relationship applies to both developed and developing countries. On the other hand, the Stevenson–Wolfers group argues that the presence of such a relationship applies to both sets of countries, but only the degree of the relationship is different. That is, the long-run income–happiness relationship is generally weaker in the developed countries, but generally stronger in the developing countries. Interestingly, though, the recent findings of Sacks et al. (2012), Diener et al. (2013) and Stevenson and Wolfers (2013) show that income growth affects happiness in the same degree regardless of the country groupings, albeit Diener et al. (2010) find that income growth shows more impact on happiness in the developed countries than in the developing countries.

Fourth, both the Easterlin and Stevenson–Wolfers groups obtain positive but very small estimates on the long-run income–happiness relationship. Earlier studies such as Oswald (1997), Veenhoven and Haggerty (2006), Clark and Senik (2011), and

[1] Easterlin and Angelescu (2009) explain that a positive coefficient on income growth is an artifact of the dataset of Stevenson and Wolfers (2008) whose analysis includes the post-transition period but not the pre-transition period of the Eastern European countries.

Veenhoven and Vergunst (2014) made a similar observation as well. Clearly, while the findings of both groups suggest that income growth is not the end-all and be-all to happiness, it is apparent in the extant literature that many things constitute happiness. Such is necessarily the case because income growth and happiness are fundamentally different concepts: the former is a proxy measure of an economy's well-being, and the latter is a proxy measure of the people's well-being. Such is also the case because the transformation of income growth into happiness is neither definite nor automatic. Moreover, there is also an issue about how social values and preferences are now inextricably linked to money, income, and wealth, but disassociated from relationships, community, and citizenship. Ensuring that analyses are sound and robust is of course important, but it seems that the debate on the Easterlin Paradox tends to focus more on the statistical significance of the evidence and less, if at all, on the practical meaning of the finding.

The foregoing introduction acknowledges that the debate on the Easterlin Paradox is one of those situations in which researchers are examining an issue using different perspectives and empirical strategies. This paper, in turn, contributes to the debate by asserting that an economic significance reading of the evidence might be more helpful to a better appreciation of the paradox itself and, hopefully, to a resolution of the debate as well. The paper asserts that a rejection of the paradox must hinge on an affirmative answer to the question: "Does the estimated long-run relationship between income growth and happiness indicate any economic significance?"

What, then, does "economic significance" mean? McCloskey (1985) and Ziliak and McCloskey (2008) explain that economic significance refers to the substantive content or meaningfulness of the estimated relationship between, say, two variables. In turn, they say that "substantive content" or "meaningfulness" is about the size of the estimate—that is, the evidence is large enough to be noteworthy. In short, economic significance indicates the "oomph." Still, Thornbecke (2004) adds that making the theory or framework underpinning the analysis transparent helps in specifying an acceptable oomph.

As regards the Easterlin Paradox, then, economic significance means checking if the evidence is useful for a meaningful understanding of the long-run relationship between income growth and happiness. Accordingly, an evaluation of the paradox becomes less about whether the estimated long-run relationship is statistically equal to zero or not, but more about whether the estimated long-run relationship is practically equal to zero or not. Nevertheless, in the context of the debate on the Easterlin Paradox, I agree with Engsted (2009) that it is still worthwhile to ensure that the estimated long-run relationship is not a spurious finding or an outcome of biased calculation procedures.[2] Statistical analysis, in this context, does not play a be-all and end-all role, but plays an instrumental role in reaching a conclusion that has economics relevance.

[2] I agree with McCloskey (1985) and Ziliak and McCloskey (2008) on their objection regarding the strict application of statistical testing. Indeed, more powerful regression procedures and large-scale datasets can easily detect a statistically significant but minute relationship between two variables. An estimate of, say, 0.0001 that is statistically significant at $p < 0.05$ merely proves that the figure is not due to chance; but, in closer inspection, 0.0001 is practically equal to zero, and so it has no economic significance.

Given the foregoing remarks, this paper takes the Easterlin Paradox as its default position. The analysis in this paper tries to account for the different phenomena as pointed out by the Easterlin group. What I obtain in the end is a measure for the "net" long-run income–happiness relationship, which should practically be a zero estimate precisely because the estimation tries to account for the occurrence of the paradox. As such, a decision to reject the paradox can only make sense if the evaluation of the evidence remains in the realm of statistical significance, as the Stevenson–Wolfers group does.

Like the Easterlin and Stevenson–Wolfers groups, this paper uses country-level time series data in its analysis. But, unlike the two groups, the empirical scope of this paper is rather limited because the dataset covers nine developed countries only. The evidence therefore needs to be interpreted with some caution. Needless to say, the availability of an extended time series dataset that not only covers a large group of countries, but also contains information comparable across countries remains a major obstacle in doing an analysis such as what this paper is trying to accomplish. All the same, the foregoing introduction suggests that the findings of this paper are not going to be substantively different from those of the Easterlin and Stevenson–Wolfers groups, especially when they are viewed using the lens of economic significance.

The rest of the paper has the following structure. Part 2 presents a framework for an analysis of the Easterlin Paradox. A discussion of the data and empirical strategy follows in Part 3. The findings and implications come in Part 4. The last part concludes the paper.

2 Framework

2.1 Conceptual framework

Consider a happiness function like

$$H_t = F[Y_t^*] \tag{1a}$$

where H_t is (reported) happiness, Y_t^* is a composite of income stimuli, and t is time. The impact of Y_t^* on H is $\frac{\mathrm{d}H_t}{\mathrm{d}Y_t^*} \geq 0$.

Suppose $F\left[Y_t^*\right] = F\left[Y_t, Y_t^e, Y_t^r\right]$, where Y_t is current income, Y_t^e is expectation income, and Y_t^r is relative income. Define the impact of Y_t on H_t as $\frac{\partial H_t}{\partial Y_t} \geq 0$.

The latter two terms in $F[Y_t, Y_t^e, Y_t^r]$ represent measures for social comparison in income. Both take on a relative income setup (Duesenberry 1952; see also Pollak 1976; Frank 1985). If so, Y_t^e represents the anticipation of income effect (Hirschman 1973): social comparison income with respect to a superior group's income Y_t^{sg}. Define its impact on H_t as $\frac{\partial H_t}{\partial Y_t^e} \geq 0$ given $Y_t^e = \frac{Y_t^{sg}}{Y_t}$. Next, Y_t^r represents the relative deprivation of income effect (Merton and Kitt 1950; see also Festinger 1954): social comparison in income with respect to a peer group's income Y_t^{pg}. Define its impact on H_t as $\frac{\partial H_t}{\partial Y_t^r} \leq 0$ given $Y_t^r = \frac{Y_t}{Y_t^{pg}}$.

Consider, again, the happiness function in Eq. (1a) but, this time, include the adaptation level AY_t (Frederick and Loewenstein 1999; see also Helson 1964). Equation (1a) thus modifies into

$$H_t = F[Y_t^* - AY_t] \tag{1b}$$

The expression shows the current income stimuli net of the adaptation level as the determinant of current happiness. Define the initial condition of Eq. (1b) as $H_0 = F\left[Y_0^*\right]$ and $AY_0 = 0$.

As with Frederick and Loewenstein (1999), the adaptation level takes the form

$$AY_t = \alpha Y_{t-1}^* + (1-\alpha)AY_{t-1} - \left(\sum_{i=1}^{t-1} \alpha(1-\alpha)^i Y_{(t-1)-i}^* + \sum_{i=1}^{t-1} (1-\alpha)^{i+1} AY_{(t-1)-i}\right) \tag{2}$$

where α is the rate of adaptation, which takes the value between 0 and 1 (see the "Appendix" of this paper for the cases of zero and instantaneous rates of adaptation.) Eq. (2) puts more weight on the more recent income stimuli. Rearranging the terms obtains

$$\begin{aligned} \Delta AY_t = {} & \alpha(Y_{t-1}^* - AY_{t-1}) \\ & - \left(\sum_{i=1}^{t-1} (1-\alpha)^i \alpha(Y_{(t-1)-i}^* - AY_{(t-1)-i}) + \sum_{i=1}^{t-1} (1-\alpha) AY_{(t-1)-i}\right) \end{aligned} \tag{3}$$

From Eq. (1b), let the change in happiness be

$$\Delta H_t = F[\Delta Y_t^* - \Delta AY_t] \tag{1c}$$

If I substitute Eq. (3) into Eq. (1c), next move H_{t-1} from the left-hand to the right-hand side of the equation, and then group the common terms, I obtain the expression

$$H_t = F\left[\Delta Y_t^* + H_{t-1} - \alpha H_{t-1} + \alpha \sum_{i=1}^{t-1} (1-\alpha) H_{(t-1)-i} + \sum_{i=1}^{t-1} (1-\alpha) AY_{(t-1)-i}\right] \tag{4}$$

If $AY_0 \equiv AY_{(t-1)-i} = 0$, then Eq. (4) becomes

$$H_t = F\left[\Delta Y_t^* + (1-\alpha)H_{t-1} + \alpha \sum_{i=1}^{t-1} (1-\alpha)^i H_{(t-1)-i}\right] \tag{5}$$

Simplifying Eq. (5), I obtain

$$H_t = F\left[\Delta Y_t^* + \sum_{i=0}^{t} \lambda_i H_{(t-1)-i}\right] \tag{6a}$$

where $\lambda_i = \alpha^i(1-\alpha)^{i+1}$ and $i = 0, 1 \ldots t$. The λs are positive because, again, α is

between 0 and 1. If the income terms in $F\left[Y_t^*\right]$ are in the natural logarithm form, then Eq. (6a) transforms into

$$H_t = F\left[y_t^* + \sum_{i=0}^{t} \lambda_i H_{(t-1)-i}\right] \tag{6b}$$

where $F\left[y_t^*\right] = F\left[y_t, y_t^e, y_t^r\right]$, y_t is the rate of income growth, y_t^e is the rate of expectation income growth (i.e., $\frac{y_t^{sg}}{y_t}$), and y_t^r is the rate of relative income growth (i.e., $\frac{y_t^{pg}}{y_t}$).

2.2 Empirical framework

Equations (6a) and (6b) specify a general adaptation process in happiness that depends on its own past values. The setup is similar to hedonic treadmill (Brickman and Campbell 1971), set point (Lykken and Tellegen 1996), or general habituation (Bottan and Perez Turglia (2011). All the same, a more explicit setup for y_t^* is necessary in order to see the net impact of the income stimuli at different periods. That is, an econometric model from Eqs. (6a) and (6b) must also incorporate specific domains adaptation processes in terms of the income stimuli that depends on the respective past values of income [i.e., habit formation (Pollak 1970)] as well as in terms of relative and expectation incomes (i.e., social comparison). One reason for doing so is that the impacts of the income stimuli might not be apparent in the short run, but manifest after some time. Another reason is that the impacts of the income stimuli might manifest in the short run, but there are also additional effects in the subsequent periods. These effects are measurable using a distributed lag process of the income stimuli.

Using Eq. (6b), for instance, I define the following structural model

$$H_t = \alpha_0 + \sum_{i=0}^{t} \beta_i y_{t-i} + \sum_{i=0}^{t} \theta_i y_{t+i}^e + \sum_{i=0}^{t} \varphi_i y_{t-i}^r + \sum_{i=0}^{t} \lambda_i H_{(t-1)-i} + \text{error}_t \tag{7a}$$

where "error" is the residual. Equation (7a) is a dynamic setup with an autoregressive distributed lag setup. The expression $\sum_{i=0}^{t} \beta_i y_{t-i} + \sum_{i=0}^{t} \theta_i y_{t+1}^e + \sum_{i=0}^{t} \varphi_i y_{t-i}^r$ accounts for the income stimuli. The expression $\sum_{i=0}^{t} \lambda_i H_{(t-1)-i}$ accounts not only for the historical information of happiness, but also for other omitted variables.[3] Then, the long run impact of income growth on happiness (i.e., at the "equilibrium") is

[3] Suppose $\beta_0 > 0$ and set $\theta_0 = \varphi_0 = 0$. The initial impact of y_t on H_t is β_0. All things the same, the initial impact β_0 translates as $\beta_0\lambda_0$ on H_{t-1}, $\beta_0\lambda_0\lambda_1$ on H_{t-2}, $\beta_0\lambda_0\lambda_1\lambda_2$ on H_{t-3}, etc. Suppose, too, y_{t-1} has an impact of $\beta_1 > 0$. All things the same, the subsequent impacts of β_1 are $\beta_1\lambda_0$ on H_{t-1}, $\beta_1\lambda_0\lambda_1$ on H_{t-2}, $\beta_1\lambda_0\lambda_1\lambda_2$ on H_{t-3}, etc. Graham (2011), for example, argues the case of an "unhappy growth" or $\beta_0 < 0$. If so, the impacts of $-\beta_0$ are $-\beta_0\lambda_0$ on H_{t-1}, $-\beta_0\lambda_0\lambda_1$ on H_{t-2}, $-\beta_0\lambda_0\lambda_1\lambda_2$ on H_{t-3}, etc. In either β_0 or $-\beta_0$ notice a "steady" adjustment process as H_t moves toward its new equilibrium.

$$\frac{dH^*}{dY^*} = \frac{\sum_{i=0}^{t} (\beta_i + \theta_i + \varphi_i)}{1 - \sum_{i=0}^{t} \lambda_i} \tag{8}$$

with $\sum_{i=0}^{t} (\beta_i + \theta_i + \phi_i)$ as the net effect of the income stimuli.

3 Methodology

3.1 Description of variables and data sources

In this section, I present a description of the variables in my analysis. First, y_t is the annual growth rate of real gross domestic product per capita (GDPPC) of each country in the sample. Like the Easterlin group, I express the figures in percentage terms.

Second, y_t^e is either the annual growth rate of GDPPC of the USA or the average annual growth rate of GDPPC of the Group of Seven (G-7). The former identifies the USA as a "country to beat" in the context of global economic competition (Dumenil et al. 2001; Brenner 2006), whereas the latter takes the economic performance of the G-7 as a measure of what the sample countries might achieve because of collective economic momentum. Each setup doubles as a proxy measure for robustness because the USA is also part of the G-7. Like y_t earlier, I express y_t^e in percentage terms.

Third, y_t^r uses the annual growth rate of GDPPC of the neighboring countries as proxy measure for the peer group's income. Following Becchetti et al. (2013), for example, "neighbors" refer to countries that share a common border with a reference country (see also Luttmer 2005; Clark and Senik 2010). I restrict the coverage within the sample countries but modify the identification to include the "proximate" neighbors. For instance, the United Kingdom in this setup has Ireland and France as proximate neighbors. For robustness, I include the USA as another proximate neighbor of each country in the sample. The set up of y_t^r is the same as with the earlier income variables.

Lastly, H_t is the average annual life satisfaction of each country in the sample. The country averages come from the individual responses to the question: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, not at all satisfied with the life you lead?" Responses take the values 4, 3, 2, and 1, respectively. As such, H_t is a continuous number between 4 and 1.

In this paper, I make use of the longest publicly available country-level time series data. Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, Netherlands, and United Kingdom form a convenient sample because they have data from 1973 to 2012. More important, the information is comparable across the sample countries. The income data are from the World Development Indicators, but I resort to Penn Tables 7.1 just to complete the y_t series for Ireland. The happiness data are from the Eurobarometer.[4]

[4] The World Happiness Database has data for the sample countries in this paper as well as for Japan and the United States, but there is an issue concerning the comparability of the data because the survey procedure and measure for happiness are different in the cases of Japan and the United States. The Gallup World Poll is an alternative source but the data are very costly to acquire.

3.2 Empirical strategy

The studies that examine a dynamic setup of the income–happiness relationship use individual-level time series data from one country or few countries such as Stutzer (2004), Newman et al. (2008), Di Tella and MacCulloch (2010), Di Tella et al. (2010), Bottan and Perez Turglia (2011), Wunder (2012), Bartolini et al. (2013), Paul and Guilbert (2013), and Vendrik (2013). Their findings, for the most part, confirm a positive and very small long-run income–happiness relationship, but not one of them analyzes the results in terms of economic significance.

This paper reverts to country-level time series data in its analysis to be consistent with the debate on the Easterlin Paradox. It also builds on the extant studies in general by highlighting economic significance in the interpretation of the evidence. Specifically, I begin by estimating the following econometric model

$$H_{jt} = \alpha_0 + \sum_{i=0}^{t} \beta_i y_{j,t-i} + \sum_{i=0}^{t} \theta_i y^e_{j,t+i} + \sum_{i=0}^{t} \varphi_i y^r_{j,t-i} + \sum_{i=0}^{t} \lambda_i H_{j,(t-1)-i} + \text{error}_{jt} \quad (7b)$$

where j refers to the country in the sample. There is, as far as I know, no other study that analyzes a setup like Eq. (7b) using country-level data.

Given that the identification of the reference groups (i.e., superior and peer groups) is problematic because of their endogeneity to income growth and given that the conventional procedure of fixed effects to control for the unobservable country-level heterogeneity is not efficient because of the autoregressive setup, the GMM-SYS is therefore the more appropriate procedure for Eq. (7b). Moreover, I resort to stepwise regression because the number of lags on the regressors is not set *ex ante*. More specifically, the regression strategy is to stop the lagging of a regressor when the coefficient on its subsequent lag turns out to be statistically not significant even at a p value of, say, 0.20 (Footnote 2). In addition, I also rely on the Arellano–Bond autocorrelation test in the determination of the appropriate number of lags on the regressors. I am simultaneously mindful that the extant studies listed in the earlier paragraph report short lags on happiness and even shorter lags on the income variables.

4 Findings

4.1 Descriptive analysis

Figure 1 shows the decadal trends in income growth and happiness for the sample countries. It shows y_t falling but H_t rising, albeit slightly, across the decades. Figure 2, in turn, details y_t of each country in the sample: Belgium ($\bar{y} = 1.73$ and $s_y = 1.95$), Denmark ($\bar{y} = 1.45$ and $s_y = 2.23$), France ($\bar{y} = 1.54$ and $s_y = 1.72$), Germany ($\bar{y} = 1.86$ and $s_y = 1.96$), Italy ($\bar{y} = 1.59$ and $s_y = 2.45$), Ireland ($\bar{y} = 3.24$ and $s_y = 4.53$), Luxembourg ($\bar{y} = 2.59$ and $s_y = 3.60$), Netherlands ($\bar{y} = 1.72$ and $s_y = 1.87$), and United Kingdom ($\bar{y} = 1.85$ and $s_y = 2.37$). The trends in Fig. 2 indicate a pattern that is, perhaps, typical of the developed countries.

Ireland reports the highest average income growth for the whole period. Denmark reports the lowest average for the whole period, with both France and Italy also indicating comparable figures. The key statistics for the whole sample are $\bar{y} = 1.98$, $s_y = 2.59$, range = 1.78 (i.e., 3.23 minus 1.45), and mode between 1.5 and 2.0.

Meanwhile, Fig. 3 presents the trends in H_t for the sample countries: Belgium ($\bar{H} = 3.13$ and $s_H = 0.11$), Denmark ($\bar{H} = 3.56$ and $s_H = 0.06$), France ($\bar{H} = 2.86$ and $s_H = 0.09$), Germany ($\bar{H} = 2.98$ and $s_H = 0.09$), Italy ($\bar{H} = 2.76$ and $s_H = 0.12$), Ireland ($\bar{H} = 3.19$ and $s_H = 0.09$), Luxembourg ($\bar{H} = 3.31$ and $s_H = 0.06$), Netherlands ($\bar{H} = 3.38$ and $s_H = 0.04$), and United Kingdom ($\bar{H} = 3.17$ and $s_H = 0.04$). In contrast to Fig. 2, the trends in H_t are relatively stable throughout the period; yet, they seem to display mild, albeit almost unnoticeable, fluctuations across the years. Denmark has the highest but Italy has the lowest average H_t for the whole period. The whole sample has the following key statistics: $\bar{H} = 3.15$, $s_H = 0.25$, range = 0.80 [which is equivalent to two notches on a 1–10 scale (i.e., 0.08 times 2.5)], and mode between 3.0 and 3.5.

Analyses of means reveal that y_t is statistically different across the sample countries not only in terms of their whole-period averages [$F(8, 359) = 1.92$, $p < 0.10$], but also for the decadal [$F(4, 359) = 7.99$, $p < 0.01$] and annual averages [$F(39, 359) = 9.71$, $p < 0.01$]. Further analyses of means reveal that H_t for the whole period is statistically different across the sample countries [$F(8, 359) = 344.02$, $p < 0.01$] but the decadal [$F(4, 359) = 1.15$, $p =$ n.s.] and annual figures of H_t [$F(38, 359) = 0.24$, $p =$ n.s.] are statistically comparable across the sample countries. Together, the two results suggest that there are commonalities in the H_t trajectories even if there are differences in the y_t trajectories.

4.2 Regression analysis

Table 1 summarizes the results for Eq. (7b) using dynamic panel regression. Model 1 shows the "baseline" result with three lags on H_t. The table does not anymore present four lags on H_t because the result is statistically not significant even at $p = 0.20$. The average of the lagged happiness variables from Models 1 to 5 is 0.933 (or, from Models 2 to 5, 0.934), which implies "complete" adaptation in happiness after the fourth year.

The results for Models 2–5 lead to the following observations. First, in the context of statistical significance, the four specifications reveal no short-run impact of income growth on happiness. In the context of economic significance, however, the results nonetheless indicate a very small short-run income–happiness relationship. But a more interesting finding from Models 2 to 5 is that the average size of the β_0 (0.001) turns out to be comparable with those of Stevenson and Wolfers (2008), who use data from the Eurobarometer, and of Veenhoven and Vergunst (2014), who use data from the World Happiness Database.

The results on the one-period and the two-period lags on income growth indicate opposing signs, which implies a long-run adjustment in income growth occurs in the third year. Therefore, the results not only indicate that there is a long-run impact of income growth on happiness, but also that there is a relatively quick adjustment in

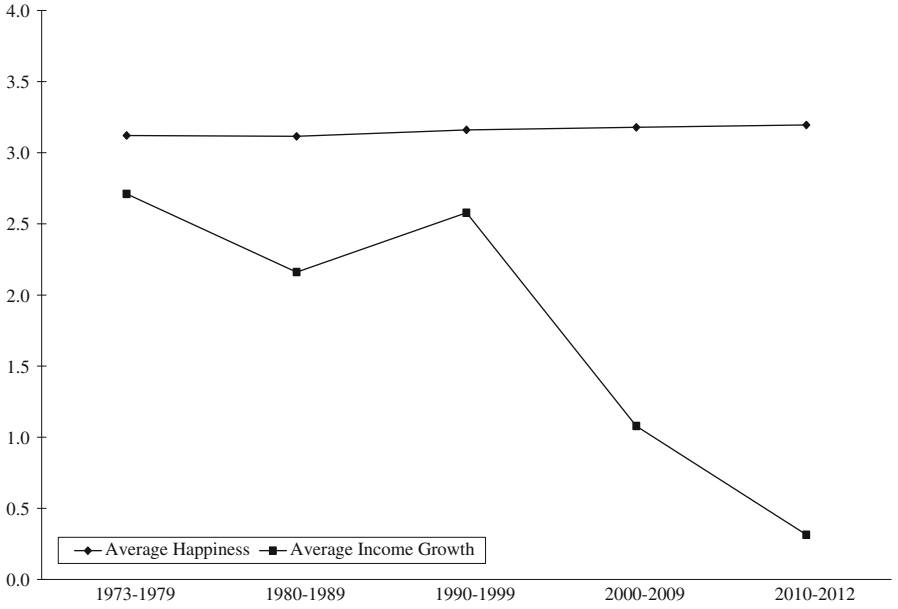

Fig. 1 Trends in decadal average in income growth and happiness

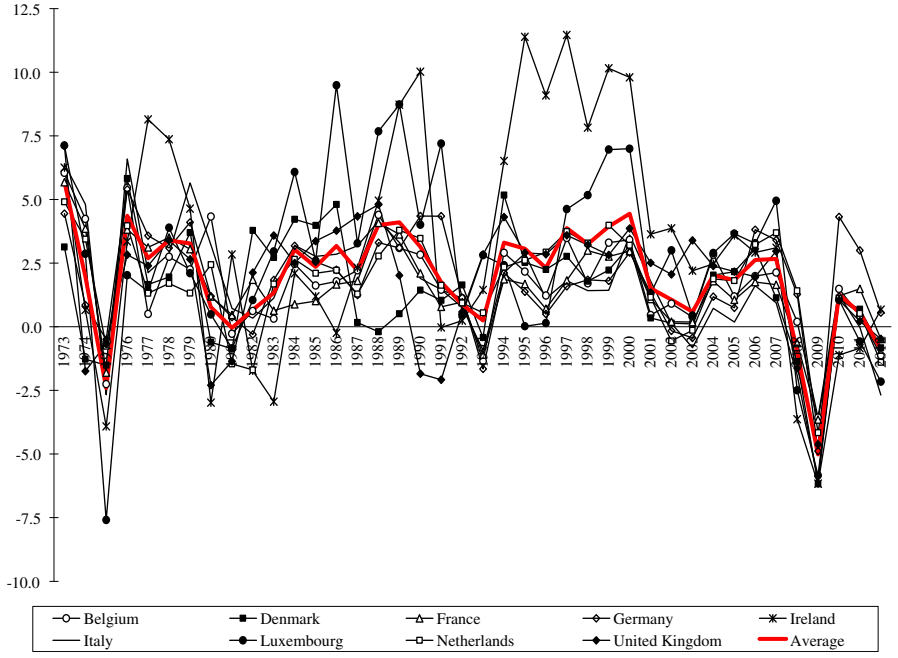

Fig. 2 Trends in annual per capita income growth, 1973–2012. Mean (1973–2012): 1.98

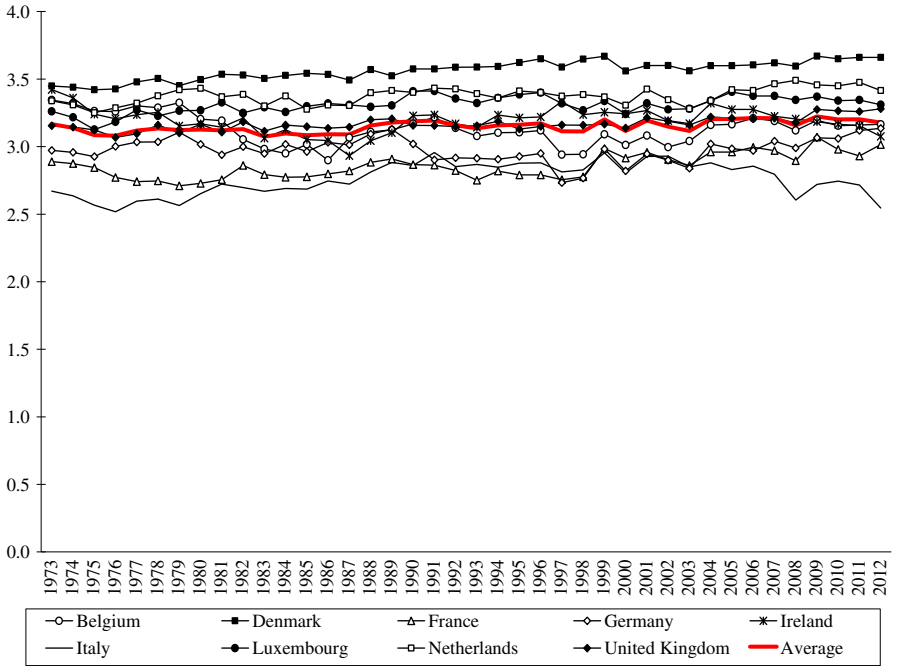

Fig. 3 Trends in average happiness, 1973–2012. Mean (1973–2012): 3.15

the way income growth gets to affect happiness. Again, it is also interesting to mention that the finding is consistent with Di Tella et al. (2001, 2003, 2010), who use data from the Eurobarometer and the German Socio-Economic Panel. For Models 2–5, the average of $\beta_1 + \beta_2$ (0.003) is comparable with the estimate of Veenhoven and Vergunst (2014). In short, the net effect of the income stimuli on happiness (i.e., $\beta_0 + \beta_1 + \beta_2 = 0.004$) is definitely a statistically positive value but its magnitude is very small.

The results for social comparison in income show that both the short and the long-run impacts of expectation income growth on happiness are statistically significant but only the long-run impact of relative income growth on happiness is statistically significant. Table 1 again does not anymore present the results for the two-period forecasts on expectation income growth and two-period lags on relative income growth because they are both statistically not significant even at $p = 0.20$. From Models 2 to 5, the averages of $\theta_0 + \theta_1$ (0.001) and of $\varphi_0 + \varphi_1$ (−0.001) are statistically significant ($p < 0.05$). In terms of economic significance, though, the results imply that a positive outlook in economic performance offsets the negative consequences of envy. This finding is in fact consistent with what Stevenson and Wolfers (2008) and Sacks et al. (2012) conclude that the social comparison of income plays a smaller role in affecting happiness.

All together, I obtain 0.005 as the average net impact of the income stimuli (using Models 2–5; $p < 0.05$). With Eq. 8, I obtain 0.078 as the average long-run income–

Table 1 Income–happiness relationship

	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	0.198	0.254	0.241	0.174	0.154
	0.064	0.025	0.028	0.096	0.119
H_{t-1}, Happiness lagged-1	0.696	0.666	0.679	0.667	0.679
	0.000	0.000	0.000	0.000	0.000
H_{t-2}, Happiness lagged-2	0.119	0.105	0.106	0.125	0.127
	0.086	0.097	0.104	0.052	0.050
H_{t-3}, Happiness lagged-3	0.114	0.147	0.139	0.151	0.145
	0.080	0.017	0.025	0.010	0.013
y_t, Income growth (current)		0.002	0.001	0.002	0.001
		0.200	0.313	0.160	0.254
y_{t-1}, Income growth lagged-1		0.008	0.008	0.007	0.007
		0.000	0.000	0.000	0.000
y_{t-2}, Income growth lagged-2		−0.005	−0.004	−0.005	−0.004
		0.000	0.001	0.000	0.000
y_t^e, Expectation income growth (current)		0.000	0.000	0.000	0.000
		0.035	0.028	0.088	0.056
y_{t-1}^e, Expectation income growth lagged-1		0.001	0.001	0.001	0.001
		0.019	0.040	0.024	0.054
y_t^r, Relative income growth (current)		0.000	0.000	0.000	0.000
		0.265	0.263	0.255	0.202
y_{t-1}^r Relative income growth lagged-1		−0.001	−0.001	−0.001	−0.001
		0.039	0.035	0.020	0.009
AR(1)	−2.792	−2.816	−2.808	−2.815	−2.809
	0.005	0.005	0.005	0.005	0.005
AR(2)	1.160	0.920	1.134	1.058	1.283
	0.246	0.357	0.257	0.290	0.199
Time fixed effect	Yes	Yes	Yes	Yes	Yes

1. Estimates come from dynamic panel regressions via GMM-SYS. The dependent variable is H_t. Numbers below the parameter estimates are p values

2. Model 2: Expectation income growth is $y_t^e = y_t^{\mathrm{US}}/y_t$, and relative income growth is $y_t^r = y_t/y_t^{\mathrm{pg}}$. Model 3: Expectation income growth is $y_t^e = y_t^{G7}/y_t$, and relative income growth is $y_t^r = y_t/y_t^{\mathrm{pg}}$. Peer groups (pg) are in brackets: Belgium [France, Germany, Luxembourg, Netherlands, United Kingdom]; Denmark [Germany]; France [Belgium, Germany, Luxembourg, Italy]; Germany [Belgium, Denmark, France, Luxembourg, Netherlands]; Ireland [United Kingdom]; Italy [France]; Luxembourg [Belgium, France, Germany]; Netherlands [Belgium, Germany]; United Kingdom [Ireland, France]

3. Model 4: Expectation income growth is $y_t^e = y_t^{\mathrm{US}}/y_t$, and relative income growth is $y_t^r = y_t/y_t^{\mathrm{pg}}$. Model 5: Expectation income growth is $y_t^e = y_t^{G7}/y_t$, and relative income growth is $y_t^r = y_t/y_t^{\mathrm{pg}}$. Peer groups are the same as Models 2 and 3 plus the USA

happiness relationship. The estimate, in turn, implies that the sample countries must sustain an annual growth rate of the income stimuli at, say, 2 % for the next 20.5 years in order to raise average happiness from 3.15 to 3.20—that is, there is an average increase of 0.002 in happiness for each year of 2 % growth of the income

stimuli. Or, alternatively, consider the following second demonstration: the sample countries must sustain an annual growth of the income stimuli at, say, 5 % for the next 8.2 years in order to raise average happiness to 3.20—that is, there is an average increase of 0.006 in happiness for each year of 5 % growth on the income stimuli. Indeed, however, the numbers are viewed, they are practically equal to zero, and therefore, they have no oomph.

4.3 Some implications

Let me reiterate that the empirical scope of this paper is rather limited because its dataset covers a few countries, and so the foregoing evidence needs to be interpreted with some caution. Still, the findings confirm a statistically significant positive long-run relationship between income growth and happiness, thereby requiring a rejection of the Easterlin Paradox according to the Stevenson–Wolfers group. Yet, another reading sees the estimated long-run impact of the income growth on happiness to be practically equal to zero, thereby requiring the acceptance of the paradox according to the Easterlin group.

Therefore, in the context of this paper, a substantive reading of the findings leads to a revalidation of the Easterlin Paradox because, in closer inspection, the estimates do not reveal any economic significance. The evidence reveals that income growth has very little oomph in terms of raising happiness, and such an estimate is more remarkable when put in the present context of Europe where the political and economic configuration makes income growth for even a few years a big challenge in itself. Consequently, the answer to the query posted in the introduction of the paper is the following: there is no substantive evidence of a long-run relationship between income growth and happiness.

Let me point out, though, that dismissing statistical significance in favor of economic significance is not the same as committing a Type II error because statistical significance remains the basis for embracing economic significance. Let me further point out that this conclusion does not mean that income growth per se does not or cannot bring any benefit to society in general. Rather, what the conclusion merely reveals is that, as regards happiness, any short-run positive effect from income growth does not endure in the long term.

Arguably, the evidence can be viewed to mean that non-income factors are more effective in raising happiness. This interpretation is not implausible because non-income factors like sound institutions and deep social capital are known to produce a setting that allows the people to advance their own life circumstances as far as possible and thus achieve greater happiness in the process (Frey and Stutzer 2000; Helliwell and Putnam 2004; Headey et al. 2010). The hurdle, of course, is to identify the aggregate metrics, measure their relative contributions to happiness, and use the findings to inform public policy.

Ultimately, the conclusion based on economic significance draws attention to the following issues as regards the Easterlin Paradox. First, the evidence reinforces the argument raised earlier in the introduction of the paper, namely there are fundamental differences between income growth and happiness: income growth is about an economy's well-being but happiness is about the people's well-being.

While they are not necessarily contradictory matters, there is really no guarantee that the former translates as the latter in a meaningful way and do so consistently across time. Income growth may turn out to be a good measure for the economy but it remains not, and probably never was, a good measure for happiness.

Second, the natural tendency to compare human well-being and disregard adaptation also tends to overemphasize income growth as a determinant of happiness. Perhaps, as suggested by Scitovsky (1976, 1986) and Layard (1980), the situation arises because education and upbringing espoused by society and supported by the mass media glorify achievement, competition, and profitability. In such a context, then, an income-based approach serves as a mediating metric in the performance of social comparison but with limited success for doing so because it remains very difficult to carry out social comparison given that human well-being is fundamentally an internal human experience. The proper regulation of education systems and the mass media in order to direct them toward building relationships, community, and citizenship that are essential for happiness can help address the problem. As noted by Easterlin (2005), building on such non-income centric values is one way to allow society to not only overcome the consequences of but also break away from habit formation and social comparison (see also Kasser and Ryan 1993; Sheldon and Kasser 1998; Vohs et al. 2008). Yet, such a demand may be difficult to pursue if there are no parallel transformations in the institutional and cultural foundations that underpin the capitalist system.

Finally, even though earlier studies on the long-run income–happiness relationship noticed the trivial magnitude of the estimates, the extant literature in general has given short shrift about the economic significance reading of the evidence that supports the Easterlin Paradox. McCloskey (1985) and Ziliak and McCloskey (2008) observe that it is a lacuna that emanates from a predisposition to publish only those findings that point out statistical significance. Perhaps, then, this discrepancy in the interpretation of the evidence is yet another dimension for an explanation of why there remains an impasse in the debate on the Easterlin Paradox.

5 Conclusion

That the pursuit of economic progress has consequential impacts on people and societies is not a controversial matter. Of course, what economic progress means in particular contexts and times is a matter of public discussion. How government pursues economic progress is likewise a matter of public discussion. How people and societies might respond to economic progress in order to profit from it is still another issue for public discussion. Indeed, such and other related topics comprise the context that makes the Easterlin Paradox as one of the most important ongoing debates in economics. If a common measure of economic progress like income growth does not translate as an increase in happiness, then the pursuit of income growth might be futile in the end.

Thus, in this paper, I reexamined the Easterlin Paradox. In particular, regression analyses found evidence that confirms the findings of the Stevenson–Wolfers group:

there is a robust and positive long-run relationship between income growth and happiness. The conclusion with such evidence is a rejection of the Easterlin Paradox.

However, the same regression analyses obtained very small estimates on the purported long-run relationship. The best estimates I obtained are practically equal to zero. This reading—stressing the magnitude of the estimate as the more appropriate yardstick for an evaluation—leads to the conclusion that income growth in itself is not a very effective tool for raising happiness in the long term. An outright rejection of the Easterlin Paradox is therefore not a defensible conclusion.

I hope that this paper highlighted what is probably the sensible interpretation of the evidence in this paper and in the extant literature in general, namely: a statistically significant long-run income–happiness relationship cannot reject the Easterlin Paradox when the same evidence shows no economic significance. At the same time, I hope that this paper also highlighted the role of public policy in correcting misconceptions and in shifting attention away from income-based approaches toward social-based approaches in dealing with happiness.

If people are born into social realities that define their values and preferences, then it follows that there is an inextricable connection between the social foundations and the collective appraisal and outlook in life. As such, sound education and regulation of the mass media are also important in shaping and directing human preferences toward relationships, community, and citizenship that are valuable to human well-being.

Yet, I do not go as far as to suggest that income-based approaches are worthless altogether because they remain the means for people to make possible the things and activities that make life worthwhile. At the same time, income-based approaches are not worthless altogether because they make the provision of basic services necessary for human development possible, and so, in the end, people get to enjoy the opportunities that permit them to go as far as possible in advancing their lives. The evaluation of life then is not limited to what income-based approach can reveal but become concrete in terms of how people are able to pursue and achieve the "good life." These conclusions point out in the end that income growth must first translate as improvements in the standard of living before there are increases in happiness. It is in this context that the findings of this paper affirm the Easterlin Paradox.

Future research might consider introducing time varying variables that mediate between income growth and happiness like social or relational capital as a measure of social progress. The idea is that economic and social progress should go hand in hand in creating an environment conducive for happiness. I can surmise, however, that such analysis will sustain the positive and very small long-run relationship between income growth and happiness found in this paper. Besides, the addition of time varying mediating variables might obtain an even smaller long-run relationship if compared with the estimates in this paper.

Appendix

Recall Eq. (5) in the main text:

$$H_t = F\left[\Delta Y_t^* + (1-\alpha)H_{t-1} + \alpha\sum_{i=1}^{t-1}(1-\alpha)^i H_{(t-1)-i}\right] \tag{8}$$

where $F[\Delta Y^*] = F\left[\Delta Y_t, \Delta Y_t^e, \Delta Y_t^r\right]$ represents the income stimuli. Below, Eqs. (9) and (10) as well as Eqs. (11) and (12) make up the "basic models" from which dynamic specifications are possible for regression analyses.

Zero rate of adaptation

In the case of zero happiness adaptation to income, set α to zero. No social comparison in income implies $\Delta Y_t^e = \Delta Y_t^r = 0$. If so, Eq. (8) becomes

$$h_t = F[\Delta Y] \tag{9}$$

where $h_t = \Delta H_t$. The above expression is the recent workhorse of the Easterlin group, especially Easterlin and Angelescu (2009), Easterlin and Sawangfa (2010), Easterlin et al. (2010), and Easterlin (2013).

Setting $\Delta Y_t^e \neq 0$ and $\Delta Y_t^r \neq 0$ and keeping $\alpha = 0$ obtains the expanded formulation of

$$h_t = F[\Delta Y_t, \Delta Y_t^e, \Delta Y_t^r] \tag{10}$$

Instantaneous rate of adaptation

In the case of instantaneous happiness adaptation to income, set α to one. Once again, no social comparison in income implies $\Delta Y_t^e = \Delta Y_t^r = 0$. If so, Eq. (8) reduces into

$$H_t = F[\Delta Y] \tag{11}$$

In fact, the above expression is the original workhorse of the Easterlin group; that is, Easterlin (1974, 1995, 2001).

Setting $\Delta Y_t^e \neq 0$ and $\Delta Y_t^r \neq 0$ and keeping $\alpha = 1$ obtains expanded formulation of

$$H_t = F[\Delta Y_t, \Delta Y_t^e, \Delta Y_t^r] \tag{12}$$

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