Testing the Easterlin Paradox: Results and Policy Implications

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Abstract

The Easterlin Paradox is about the contradiction between an evidence of a short-run relationship between happiness and income growth and no evidence of a long-run relationship between happiness and income growth. The paper argues that there is confirmation of the Easterlin Paradox when the magnitude of the estimated long-run relationship is practically equal to zero notwithstanding its statistical significance. The findings of the paper support the Easterlin Paradox.

Keywords: Easterlin Paradox; cointegration; autoregressive distributed lag

JEL Classification: C30; I31

1. INTRODUCTION

Easterlin (1974) notices a puzzling relationship between happiness and income growth in the case of the United States: income growth affects happiness in the short-run but not so in the long-run. In later studies, Easterlin (1995; 2001), Easterlin and Sawangfa (2010), Easterlin and Angelescu (2012), Easterlin et al. (2010) confirm the absence of a long-run relationship between happiness and income growth for many countries.[1] What is now referred to as "Easterlin Paradox" in the literature is about a discovery of an inconsistency in the standard view on how income growth affects happiness, which basically asserts that economic progress can improve human well-being regardless of the time perspective.

Contrariwise, studies like Hagerty and Veenhoven (2003), Deaton (2008), Inglehart et al. (2008), Stevenson and Wolfers (2008), Diener et al. (2013), and Veenhoven and Vergunst (2014) find a positive long-run relationship between happiness and income growth. They disagree with the Easterlin Paradox because their findings confirm the standard view that income growth affects happiness regardless of the timeframe under consideration. In response, Easterlin (2005; 2013; 2015; 2017) argues that what the skeptics find in their studies is just the short-run relationship between happiness and income growth, because their analyses only use 10 to 15 years of data. Accordingly, a proper way to test the Easterlin Paradox must use at least 20 or 25 years of data.

[1] The Easterlin Paradox applies to individuals as well: richer people are on average happier than poor people but, across time, higher income does not appear to go hand-in-hand with higher happiness. In this context, Easterlin (2001) takes the lead of Duesenberry (1949; see also Merton and Kitt 1950 and Hirschman 1973) to argue that social comparison and adaptation are important elements to the paradox at the level of individuals. See, for example, Clark et al. (2008) and Clark (2016) for reviews. Beja (2014) finds social comparison and adaptation to be important elements to the Easterlin Paradox at the level of countries.

This paper asserts the following. First, if the Easterlin Paradox is about a long-run relationship between two variables, then a direct test on it must use long periods of data. Second, the statistical significance of the evidence is a necessary condition but it is not enough to invalidate the Easterlin Paradox. More specifically, the paper argues that a direct test on the Easterlin Paradox needs to consider the economic significance of the estimated relationship. To such end, the paper uses the methodology of time series analysis then evaluates the findings not just in terms of statistical robustness but also in terms of economic relevance.

The paper has four parts. The methodology and the findings are respectively in Parts 2 and 3 of the paper. The last part concludes the discussion.

2. METHODOLOGY

2.1 Procedure

The present study uses country-level data of happiness and income growth to test the Easterlin Paradox. Earlier studies like Easterlin and Sawangfa (2010), Easterlin and Angelescu (2012), and Easterlin et al. 2010) use country-level analysis as well. Similarly, Hagerty and Veenhoven (2003), Deaton (2008), Inglehart et al. (2008), Stevenson and Wolfers (2008), and Veenhoven and Vergunst (2014) also use county-level analysis.

However, this study excludes other controls to simplify the analysis. In so doing, it obtains a ballpark answer to the query on whether or not a long-run relationship exists between happiness and income growth. The study then makes an assessment on

whether or not the estimated long-run relationship is actually large enough to matter at all. In short, the evaluation puts more weight on the economic significance interpretation of results and less on their statistical significance; but, at the same time, it does not sacrifice the statistical validity of the findings (Ziliak and McCloskey 2004, 2008; Engsted 2009).

Moreover, the study does not resort to a structural model specification like in Bottan and Perez Truglia (2011), Wunder (2012), Vendrik (2013), and Beja (2014). Rather, it uses a reduced model for the analysis. As such, the study obtains results that might be called "gross estimates" of the long-run relationship between happiness and income growth. The paper in turn asserts that, if the gross estimates from reduced models suggest little economic significance, then the "net estimates" from structural models indicate even less economic significance. Needless to say, time series data require some care in the analysis because non-stationary variables lead to spurious results. As such, the study does not compromise on the statistical robustness of results.

The following are the steps for testing the Easterlin Paradox. The study begins with tests on whether or not happiness and income growth are non-stationary variables. Do the variables contain unit roots—that is, are they integrated of order one? If there are unit roots, then the next step is to check whether or not a linear expression between happiness and income growth obtains a residual term that is stationary. If such is the case, then happiness and income growth are cointegrated variables—that is, there is a long-run relationship between happiness and income growth. Recall that the last step of the evaluation is to check whether or not the estimated relationship between the two variables is practically equal to zero.

If happiness and income growth are not cointegrated variables, then an alternative test is to run an autoregressive distributed lag model on the first differences of happiness and income growth. Thereafter, the analysis obtains the long-run propensity between the variables. The last step of the evaluation here is actually the same as that for the case of cointegrated variables, namely: check whether or not the estimated relationship between the two variables is practically equal to zero.

2.1 Data

The key variables for the study are happiness and income growth. The timeframe for the study is 1975 to 2016.

The paper interprets "happiness" as a description of subjective well-being (Kahneman et al. 1997). The proxy measure for happiness is the average life satisfaction of a country. Inglehart (2008) Deaton (2008), Di Tella and MacCulloch (2008), and Stevenson and Wolfers (2008), among others, also use life satisfaction as proxy measure for subjective well-being in their analyses of the Easterlin Paradox. In addition, the paper assumes average life satisfaction to be cardinal data.

The paper uses the longest time series data that are publicly available on the Internet. In this regard, the Eurobarometer database is an appropriate source of data. Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, and United Kingdom then form a convenient sample for the study.[2]

[2] Estimates of the long-run relationship between happiness and income growth vary between developed and developing countries. See, for example, Easterlin and Angelescu (2009), Easterlin and Sawangfa (2010), Easterlin et al. (2010). See also Stevenson and Wolfers (2008).

The paper uses the natural logarithm of real gross domestic product per capita as a proxy measure for income growth. Gross domestic product per capita is a standard variable in the analysis of the Easterlin Paradox. Data are from the OECD Statistics.

3. RESULTS

Results for the unit root tests on life satisfaction (LIFE) and on the natural logarithm of real GDP per capita (GDP) are in Table 1. The conclusion from the table is the following: LIFE and GDP are integrated variables of degree one. Then results for the Engle-Granger Cointegration Test indicate cointegration between LIFE and GDP but only for three of the eight countries in the study. Accordingly, Belgium, Germany, Ireland, Italy, and United Kingdom are in Group 1 (i.e., not cointegrated variables); then Denmark, France, and Netherlands are in Group 2 (i.e., cointegrated variables. Each group forms a separate panel. More sophisticated tests can be applied on each panel to further check on their statistical properties.

[Insert Table 1 Here]

[Insert Table 2 Here]

Table 2 shows results of the Kao Test and Westerlund Cointegration Test for Group 1. The following are the observations. First, results confirm integrated panel of order one for LIFE and GDP but no cointegration.[3] So the analysis proceeds to estimate an

[3] The Im-Pesaran-Shin Test on the residual allows for heterogeneous coefficients in the autoregressive process for each country. Its null hypothesis is that all countries follow a unit root process. Westerlund Cointegration Test is related to the Granger representation theorem. The null hypothesis of the Kao Cointegration Test and of the Westerlund Cointegration Test is no cointegration.

autoregressive distributed lag model on the first differences of LIFE and GDP for Group 1 (i.e., ΔLIFE and ΔGDP, respectively). Results indicate a long-run income-happiness propensity of 0.509. In other words, results indicate that a doubling of GDP means 0.509 increase in LIFE in the long-run (or, in unit terms, the long-run annual effect of ΔGDP on ΔLIFE is merely 0.00509).

Results for Group 2 (also in Table 2) show that LIFE and GDP are indeed cointegrated variables. The estimated long-run income-happiness relationship in this case is 0.354. That is, a doubling of GDP means 0.354 increase in LIFE (or, in unit terms, the long-run annual effect of GDP on LIFE is just 0.00354).

The above results imply that income growth in itself is not a very effective tool for raising happiness in the long-run. Still, the above results can be read in another way using the actual income growth performance of Europe. First, if the average GDP growth rate for Group 1 between 1975 and 2016 is about 2.4 percent, then a 0.509 change in LIFE is possible after 30 years of continuous income growth. Correspondingly, if the average GDP growth rate for Group 2 for the same period is about 2 percent, then a 0.354 change in LIFE is possible after at least 35 years of *continuous* income growth. Notice that, in both scenarios, the change in LIFE due to GDP hinges on the critical assumption that there is no major economic shock in Europe throughout three or four decades. Indeed, continuous income growth is quite a remarkable assertion given the present context of Europe in which income growth for even a few years is a big challenge in itself.

Interestingly, though, the estimates in Table 2 on the long-run relationship between happiness and income growth are in line with those of Hagerty and Veenhoven (2003),

Deaton (2008), Inglehart et al. (2008), Stevenson and Wolfers (2008), Diener et al. (2013), and Veenhoven and Vergunst (2014). Yet, those studies evaluate the evidence only in terms of statistical significance. Indeed, as Beja (2014) assert, the skeptics can actually validate the Easterlin Paradox if only they see the evidence not only in terms of their statistical significance but also in terms of their economic significance. The same assertion is being put forward given the findings of the paper.

4. CONCLUSION

The paper tested the Easterlin Paradox. Beyond statistical robustness, the paper looked at the magnitude of the estimated long-run relationship between happiness and income growth. Its analysis found that happiness and income growth were cointegrated for some countries but not for others. Further analysis of results concluded in the end that the estimated long-run relationship showed no economic significance at all. Therefore, the findings provide another support to the Easterlin Paradox.

Of course, the findings of the paper must be read with caution because the dataset used in the study included only few countries, dealt with annual data, excluded other control variables, and used life satisfaction as proxy for happiness. Indeed, there is reasonable basis to be cautious on the extent to which the findings can be useful and provide insights for other countries in Europe or elsewhere. Nevertheless, the findings make a strong case that validates the Easterlin Paradox.

Yet, the paper does not argue for an automatic rejection of income growth as a policy goal. While the impact of income growth on happiness may not be apparent in the long-run, the lack of income growth even in the short-run can turn out to be harmful,

because it could mean inability and insecurity in the provision of public goods and services that are very important for enabling people to pursue their happiness. Unstable income growth can also be harmful, because periodic economic recessions can undo the gains on happiness from past income growth (c.f., Beja 2017; De Neve et al. forthcoming). In a way, the paper argues that ensuring and stabilizing income growth in the short-run is as important as maintaining and securing income growth in the long-run.

Obviously, and as the Easterlin Paradox implies, sustained and stable income growth is not enough to raise happiness. That is so because the former is about an economy's well-being whereas the latter is about the people's well-being; and because there is in fact no guarantee that the income growth transforms into happiness in a meaningful and consistent way in a society and across time. In the context of the Easterlin Paradox, income growth may turn out to be a good measure for the economy but not (probably it never was) a good measure for happiness. In the end, the pursuit of income growth must be tempered by policy that deals with basic goals like jobs, education, and health care, personal safety and security, etc. in order to support the pursuit for happiness. The conduct of policy in such manner can lead to the creation of an environment that actually enables the people to advance their life circumstances as far as possible and achieve happiness in the process. Needless to say, such goals are not easy pursuits for any society when there is little or no income growth at all.

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Table 1: Results per country, 1975-2016

	Engle-Granger Cointegration Test		
	LIFE	GDP	Residual, $\hat{e} = Y - \hat{\beta}X$
Belgium	ADF t = -2.64, p = 0.10	ADF t = -2.59, p = 0.10	ADF t = -2.29, p = 0.22
Germany	ADF t = -0.54, p = 0.88	ADF t = -2.09, p = 0.25	ADF t = -1.62, p = 0.71
Ireland	ADF t = -2.39, p = 0.15	ADF t = -0.50, p = 0.89	ADF t = -2.85, p = 0.17
Italy	ADF t = -2.58, p = 0.10	ADF t = -2.43, p = 0.13	ADF t = -2.48, p = 0.30
United Kingdom	ADF t = 0.52, p = 0.98	ADF t = -1.57, p = 0.50	ADF t = -0.61, p = 0.95
Denmark	ADF t = -2.29, p = 0.18	ADF t = -1.72, p = 0.42	ADF t = -5.22, p < 0.01
France	ADF t = -0.43, p = 0.90	ADF t = -1.97, p = 0.30	ADF t = -4.76, p < 0.01
Netherlands	ADF t = -1.98, p = 0.29	ADF t = -1.05, p = 0.74	ADF t = -4.82, p < 0.01

Notes: (1) Definition: LIFE = average life satisfaction; GDP = ln real GDP per capita (2010=100); ΔGDP = income growth; (2) ADF = augmented Dickey-Fuller Test; t is t-statistics; and p is p-value.

Table 2: Results per group, 1975-2016

Country Grouping	Type of Procedure	Residual, $\hat{e} = Y - \hat{\beta} X$
Group 1	Kao Cointegration Test $LIFE_t = 1.765 + 0.119\ GDP_t$ (3.50)** (2.44)* R-square within = 0.11 R-square overall = 0.04 Westerlund Cointegration Test G_t = -1.89, p = 0.33; G_a = -6.89, p = 0.46 P_t = -4.51, p = 0.14; P_a = -7.45, p = 0.15 Autoregressive Distributed Lag Model $\Delta LIFE_t = 0.001 - 0.344\ \Delta LIFE_{t-1} + 0.620\ \Delta GDP_t$ (2.38)**(-7.30)*** (4.55)** $+ 0.350\ \Delta GDP_{t-1} - 0.286\ \Delta GDP_{t-2}$ (5.19)** (-2.26)** AR(1) errors, z = -2.15, p < 0.05 AR(2) errors, z = -1.49, p = 0.14 Sargan $\chi 2(177)$ = 173.5, p = 0.58 Wald $\chi 2(4)$ = 268.9, p < 0.01 Long-run propensity = $\frac{0.620 + 0.350 - 286}{1 + 0.344} = 0.509$	Im-Pesaran-Shin Test t = -1.00, p = 0.16 Im-Pesaran-Shin Test t = -15.1, p < 0.01
Group 2	Kao Cointegration Test $LIFE_t = -0.498 + 0.354\ GDP_t$ (-0.71) (5.35)** R-square within = 0.56 R-square overall = 0.49 Westerlund Cointegration Test G_t = -2.70, p < 0.05; G_a = -17.2, p < 0.01 P_t = -4.59, p < 0.05; P_a = -17.1, p < 0.01	Im-Pesaran-Shin Test t = -5.81, p < 0.01

Notes: (1) Definition: LIFE = average life satisfaction; GDP = ln real GDP per capita (2010=100); ΔGDP = income growth; (2) Country groupings: Group 1 = Belgium, Germany, Ireland, Italy, and United Kingdom; Group 2 = Denmark, France, and Netherlands; (3) the numbers in parenthesis are t-statistics with * = p < 0.10, ** = p < 0.05, *** = p < 0.01.