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GDP and life satisfaction: New evidence

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The link between higher national income and higher national life satisfaction is critical to economic policymaking. This column presents new evidence that the connection is hump-shaped. There is a clear, positive relation in the poorer nations and regions, but it flattens out at around $30,000–$35,000, and then turns negative.

A commission on the measurement of economic performance and social progress was created on the French government's initiative. Since 2008, this distinguished group of social scientists has put subjective well-being into the limelight as a possible supplement to traditional measures of development such as GDP (Stiglitz et al. 2009). The British government has also shown considerable interest in developing a subjective well-being measure in recent years as an instrument for policy.

Income, GDP, and life satisfaction

The debate on the link between income, or GDP, and life satisfaction is still open.

- On one hand, Easterlin (1974) reported no significant relationship between happiness and aggregate income in time-series analysis.

For example, Easterlin shows that US income per capita during the period 1974–2004 almost doubled, but the average level of happiness showed no appreciable upward trend. This puzzling finding, appropriately called the Easterlin Paradox, has been confirmed in similar studies by psychologists (Diener et al. 1995) and political scientists (Inglehart 1990), and has been confirmed for European countries (Easterlin 1995).[1]

- On the other hand, life satisfaction appears to be strictly monotonically increasing with income when one studies this relation at a point in time across nations (Inglehart 1990, Deaton 2008, Stevenson and Wolfers 2008).

To reconcile the cross-sectional evidence with the Easterlin Paradox, some have suggested that the positive relation in happiness vanishes beyond some value of income (Layard 2005, Inglehart 1990, Inglehart et al. 2008, Di Tella et al. 2010). This last interpretation has been questioned by Deaton (2008) and Stevenson and Wolfers (2008), who claim that there is a positive relation between GDP and life satisfaction in developed countries. From the opposite perspective, it is being questioned by Easterlin et al. (2010), who provide some evidence that there is no long-run effect even for developing countries.

The complexity of the income–life satisfaction relation

To start from the evidence:

- It is known that life satisfaction is increasing in personal income at a decreasing rate (e.g. Blanchflower and Oswald 2004, Layard et al. 2008, Kahneman and Deaton 2010).

However, the relationship is complicated by the existence of other effects acting with an opposite sign:[2]

- People's aspirations adapt to the new situation, an idea originally proposed by Brickman and Campbell (1971).[3]
- The effect of relative income on individual life satisfaction – the so-called 'Keeping up with the Joneses' hypothesis – an idea that dates back to Duesenberry (1949).[4]

Recently, Benjamin et al. (2012) show that maximising an individual's utility might not always coincide with maximising life satisfaction. This opens the theoretical possibility that, in equilibrium, lower levels of income might correspond to higher levels of life satisfaction.

Reassessing the relationship

Our recent work differs from the previous literature in that we undertake the analysis without imposing a particular functional form on the econometric model (Proto and Rustichini 2013).

Specifically, we partition all individual observations into quantiles of per capita GDP by the country of residence (with the first quantile of the distribution containing the individuals living in the poorest countries), and then we estimate the relation between GDP and happiness by using the quantiles.

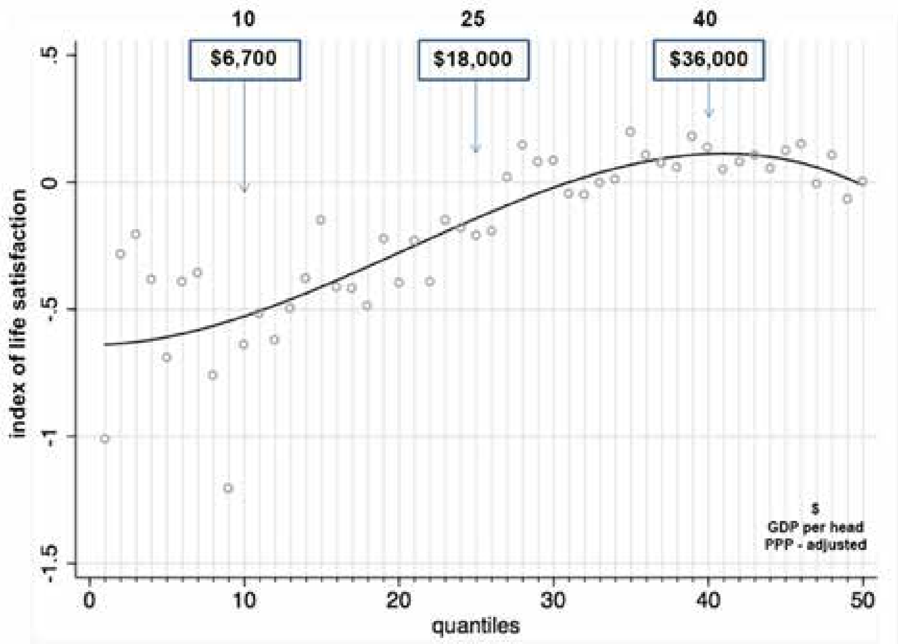
The second important methodological feature of our analysis is the introduction of a country-specific effect, to control for time-invariant country-specific unobservable variables. This eliminates potential sources of country-specific measurement error and omitted-variable bias. This control is possible thanks to the panel structure of the World Values Survey dataset. The introduction of this control is of crucial importance for analysis based on survey data, because the questionnaires are generally different across countries, and there are pervasive effects due to culture and language on the statement made in the surveys. Many measurement errors in indices of life satisfaction are possible. For example, a well-known error is due to differential item functioning, defined as the interpersonal and intercultural variation in interpreting and using the response categories for the same question.

A systematic measurement error in the life satisfaction reports lead to either a positive or negative bias, depending on the correlation between the measurement error and other variables in the regression. For example, an over-report of life satisfaction, in Western countries, could generate a positive bias in cross-country estimates of the impact of income on life satisfaction. Omitted-variable bias could be equally problematic. If cultural elements determine a time-invariant preference for public good supply in some country, or if income distribution – usually very persistent – is correlated with both life satisfaction and GDP, this would result in a bias in the relation between GDP and life satisfaction. Controlling for country-specific effects eliminates all biases that could be generated by the time-invariant unobservable variables mentioned in the examples.

Main findings

Figure 1 summarises the main findings of the analysis.

Figure 1. Relationship between GDP per capita and life satisfaction



Note: Each point represents the coefficient of an ordered probit regression of life satisfaction on all individuals in the World Values Survey (for the waves 1981–84, 1989–93, 1994–99, 1999–2004, 2005–08) grouped in 50 different quantiles according to the per capita GDP of the country they live in.

- Most of the variation of life satisfaction due to GDP is explained by the effect in countries with per capita GDP below $10,000 (data are PPP-adjusted).

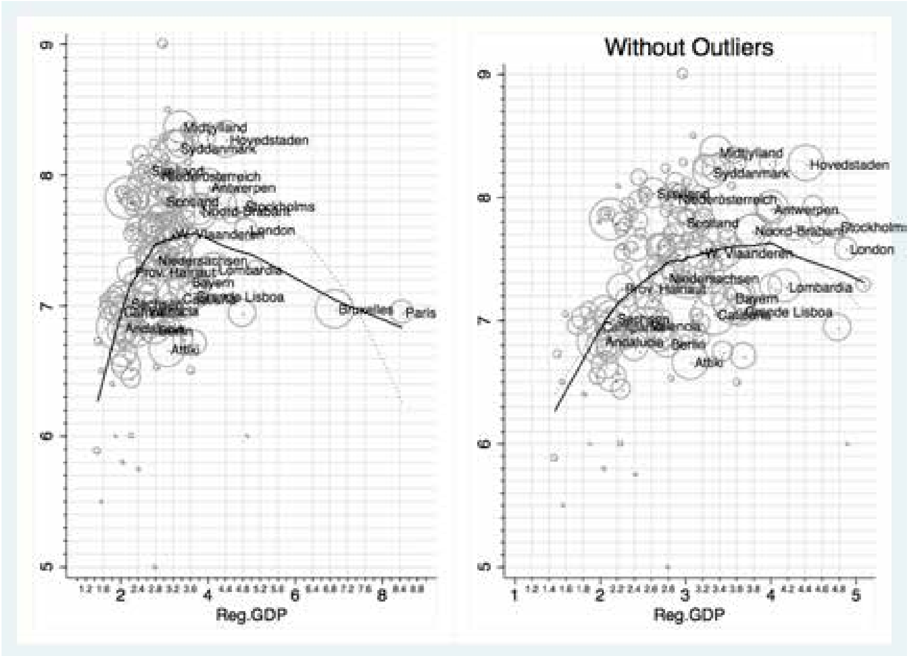
People in countries with a GDP per capita of below $6,700 were 12% less likely to report the highest level of life satisfaction than those in countries with a GDP per capita of around $20,000.

- Countries with GDP per capita over $20,000 see a much less obvious link between GDP and happiness.

Between this level and the very highest GDP per capita level ($54,000), the probability of reporting the highest level of life satisfaction changes by no more than 2%, and seems to be hump-shaped, with a bliss point at around $33,000. This corresponds broadly to the well-known Easterlin Paradox – that the link between life satisfaction and GDP is more or less flat in richer countries.

To further assess the importance of taking into account the unobserved heterogeneity, we perform a second analysis of the relationship between aggregate income and life satisfaction on more homogeneous territorial units. We restrict the sample to all countries within the EU before the first enlargement to eliminate potentially confounding factors at the country level; Figure 2 show the main findings of this second analysis. This confirms the findings of the country-based analysis outlined above.

Figure 2. Relationship between regional GDP and life satisfaction in Europe



Note: Each point represents the European Region (following the NUTS 2 nomenclature) before the first enlargement, weighted for the population. Life satisfaction data are from the European Values Survey. Data for regional GDP are from Eurostat; they are PPP-adjusted at the country level.

Data show a clearly positive relation between aggregate income and life satisfaction in the poorer regions, but this relation flattens and appears to turn negative for richer regions, with a bliss point between $30,000 and $33,000.

An explanation for the bliss point

If, following the above-mentioned literature, the relation between GDP and life satisfaction is the result of combined effects of aspirations to increase personal income, or an increasing target in terms of income comparison, then the net effect on life satisfaction is not necessarily monotonic. In Proto and Rustichini (2012), we provide a micro-founded model, where income is endogenous and increases with aspirations. If the probability of fulfilling aspirations is decreasing in aspirations, this can generate a negative effect on life satisfaction that can counterbalance the positive direct effect of the income.

We test this hypothesis using the European data, and find the usual positive effect due to personal income and a negative effect due to the negative distance between personal income and regional GDP. We argue that this second effect can be related to the negative effect induced by the distance from the target income. We use modern personality theory to test the hypothesis, predicting that this effect should be higher for more neurotic individuals, naturally more averse to losses. We find support in the data for this explanation.

Conclusions

Our econometric analysis implies that long-term GDP growth is certainly desirable among poorer countries, but is it a desirable feature among developed countries as well? Recent evidence shows the negative effect of high aspiration can also be rationally predicted by individuals who, nevertheless, may still choose options that may not seem to maximise happiness, but which are compatible with high-income aspirations.

This implies that individuals may still prefer to live in richer countries, even if this would result in a decreased level of life satisfaction. In other words, the fact that individuals aspire to a higher income may not be considered – from an individual perspective – a negative feature of an economy even if this might result in a lower level of reported life satisfaction among the richest countries.

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Footnotes

1 There is some disagreement on the conclusion when an analysis based on time-series is used. Oswald (1997) shows evidence of a small positive temporal correlation between life satisfaction and GDP in industrialised countries, and Stevenson and Wolfers (2008) find significant happiness gains in Japan in the post-war period.

2 On the considerable literature that examines the complicating factors, see Clark et al. 2008 for an extensive survey.

3 Easterlin (2005), Stutzer (2004), and McBride (2010) provide some empirical evidence on how aspirations increase in income.

4 Clark and Oswald (1996), Blanchflower and Oswald (2004), Luttmer (2005), Ferrer-i-Carbonell (2005), and Senik (2009) among others present empirical validations of this hypothesis.

About CAGE

Established in January 2010, CAGE is a research centre in the Department of Economics at the University of Warwick. Funded by the Economic and Social Research Council (ESRC), CAGE is carrying out a five year programme of innovative research.

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