Paradoxes of happiness

Why do people feel more comfortable with high levels of inequality and high murder rates?

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Happiness is not always where you expect it. (Credit: bobglennan, 'Industrial Light'/Flickr licensed under CC BY-NC-ND 2.0) (via: bit.ly)

There is evidence that income and wealth inequalities are positively associated with happiness, as measured by the happiness index, and negatively associated with suicide rates, which are seen as objective indications of unhappiness. Moreover, there is some evidence that happiness is also positively linked to murder rates, especially when they go hand in hand with inequalities.

A possible explanation is the competitive nature of human beings – a modification of the 'big fish in the small pond' story – and perceptions of social justice: it is not only that people enjoy a low, but a better-than-average position more than they do a higher position, but one below average. In below-average positions, they cherish the dream of attaining a better-than-average status.

Greater equality, which undermines the dream of attaining a higher-than-average status, turns out to be disappointing for many. If murders occur without high levels of income inequality – i.e., if murders are 'unjustified' – and/or inequality exists without high numbers of murders – i.e., inequality is not perceived as unfair and does not cause social tension – then happiness is not affected.

Happiness economics is a growing branch of economic research; it has already revealed quite a number of important determinants of happiness. The World Happiness Report ranks countries based on subjective evaluations of happiness by their people on a 0 to 10 scale. At the top of the list in recent years have been the Scandinavian countries (Finland, Norway, Denmark, Iceland, and Sweden), Switzerland, the Netherlands, Canada, Australia, New Zealand, and Israel. At the bottom of the list have been Burundi, the Central African Republic, South Sudan, Tanzania, Yemen, Rwanda, Syria, Liberia, Haiti, Malawi, Botswana, and Afghanistan.

There are six major determinants of happiness identified by the World Happiness Report (fig. 1):

- PPP GDP per capita;
- Life expectancy (measured by data from the World Health Organization);
- Social support index (measured by answers to a question about relatives or friends that one can count on to help when in need);
- Freedom index (measured by answers to a question about freedom to choose what you do with your life);
- Generosity index (a residual of a regressing national average of responses to the question; "Have you donated money to a charity in the past month?" in relation to GDP per capita);
- Corruption index (measured by answers to questions on how widespread corruption is throughout government and business).

Figure 1: Happiness score explained by different factors
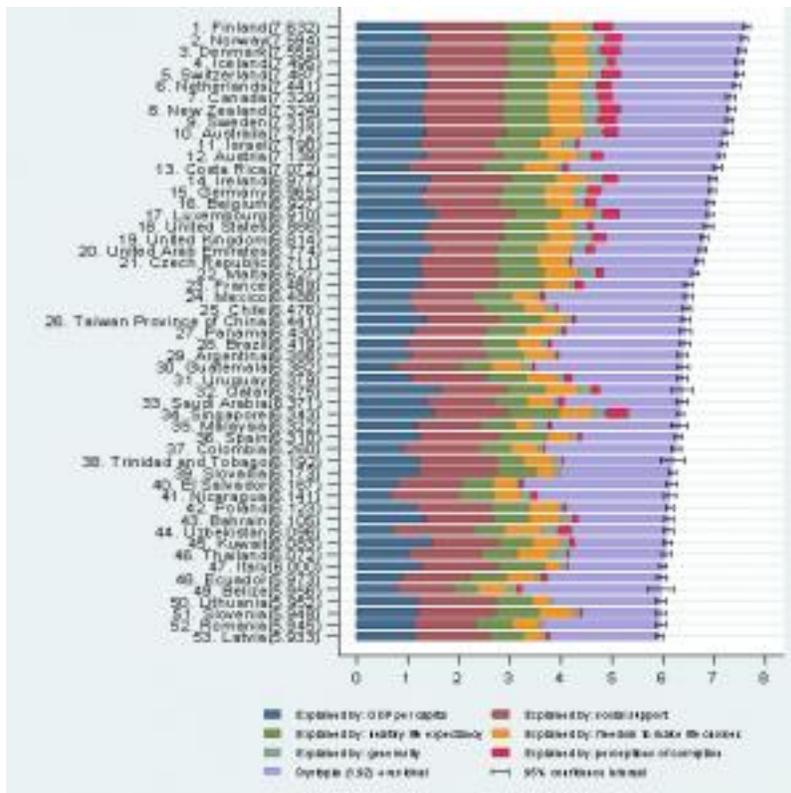
Source: Helliwell, J., Layard, R., & Sachs, J. (2018).

There are also some important paradoxes in the dynamics of happiness indices and the relative levels of these indices in various countries and different populations groups. One puzzle, the Easterlin paradox, is the decreasing level of happiness in the US in spite of constantly rising personal incomes (fig. 2). Sachs (2018) argues that America's subjective wellbeing is being systematically undermined by three interrelated epidemic diseases, notably obesity, substance abuse (especially opioid addiction), and depression. But in other countries without as much obesity, drugs, and depression, there is also a decline in happiness, going hand in hand with rising real incomes. In China, over the 1990–2000 decade, happiness plummeted despite massive improvements in material living standards. Brockmann, Delhey, Welzel, and Hao (2008) explain this as due to growing income inequality within China, i.e., related to the average national income, the financial position of most Chinese people deteriorated.

Figure 2: Average happiness score and GDP per capita, 1972–2016
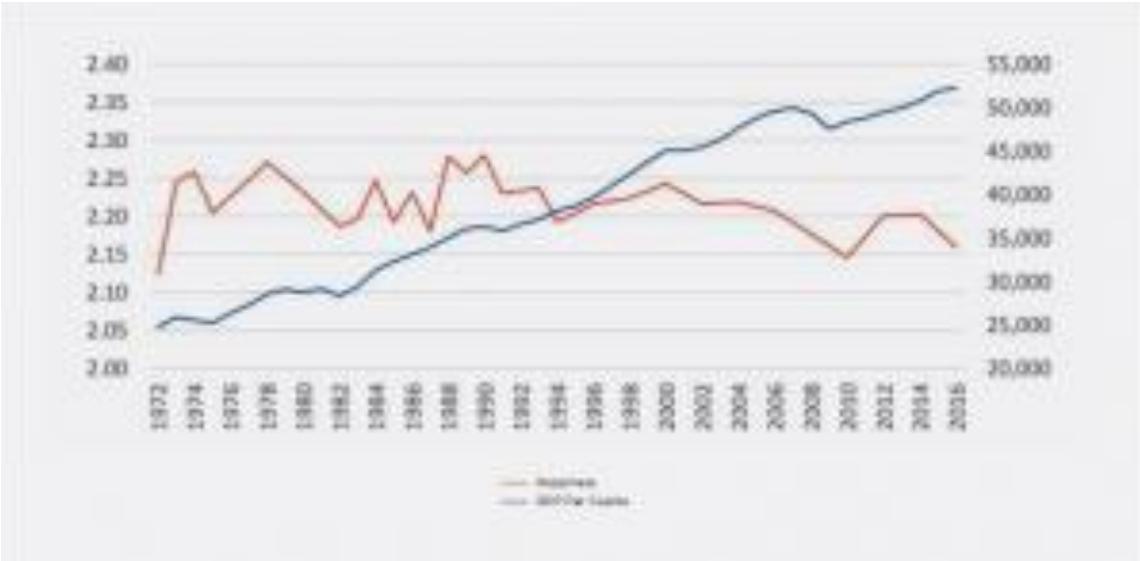
Source: Sachs (2018).

In this paper I present evidence demonstrating that income and wealth inequalities are positively associated with happiness, as measured by the happiness index, and negatively associated with suicide rates, which are seen as objective indicators of unhappiness. Moreover, there is some evidence that happiness is also positively linked with murder rates, especially when this goes hand in hand with inequalities.

Determinants of happiness

Table 1 shows the regression results of the happiness index on the determinants of happiness that are reported in the World Happiness Report: income; healthy life expectancy; social support; personal freedom; generosity; and control over corruption.

Table 1: Regression results of happiness index on per capita income, life expectancy, and other determinants in 2018; robust estimates

Equations, Number of Observations / Variables	1, N=156	2, N=142	3, N=155	4, N=142	5, N=155	6, N=155	7 N=142
Constant	1.8***	3.0***	1.9***		1.8***	1.7***	1.3***
Happiness score from 0 to 10 explained by **PPP GDP per capita in 2017** in 2011 dollars	0.9***		2.5***	1.5***	1.0***	1.0***	1.0***
Happiness score from 0 to 10 explained by **healthy life expectancy in 2016**	0.9***	3.8***	1.7***	1.4***	1.0***	1.1***	1.2***
Happiness score from 0 to 10 explained by **social support**	1.1***				1.0***	1.0***	1.0***
Happiness score from 0 to 10 explained by **freedom**	1.4***			1.7***	1.4***	1.6***	1.2***
Happiness score from 0 to 10 explained by **generosity**	0.5		1.4**	1.0*	0.7	0.9	0.8 (significant at 20%)
Happiness score from 0 to 10 explained by **corruption**[1]	0.8		1.5**		0.8		0.9 (significant at 20%)
Murder rate, 2016 or last available year, per 100,000 inhabitants					.007**	.006**	
Interaction term (**Gini coefficient*Murder rate**)		.0002*	.0003**	.0002**			.0001 (significant at 30%)
Adjusted R2, %	79	64	74	78	80	80	81

*, **, *** – Significant at 1%, 5%, and 10% levels respectively.

Not all determinants are significant in cross-country regressions: Generosity and control over corruption are not significant after the first four determinants are included (equation 1, table 1), but the results can be improved slightly by including murder rate and inequality variables. If included separately, only the murder rate is significant,[2] but when both are included into the right hand side of the equation, they lose significance. However, the interaction term (murder rate*inequality) is significant in many specifications, which means that in countries with both high levels of inequality and a high murder rate, the happiness index score is higher.

Normally there is a positive correlation between income inequality and the murder rate: the higher the level of inequality, the higher the murder rate. But in the rare instances when a high level of inequality does not go together with a high murder rate, happiness is not affected.

The robustness check – regressions for 2000 – is presented in table 2. The results are very similar and, in a sense, even stronger: Income inequality and murder rates affect happiness positively, when included into the right hand side of the regression equations separately and together.

Table 2: Regression results of the happiness index in relation to per capita income, life expectancy, and other determinants around 2000; robust estimates. Dependent variable – happiness index (from 0 to 10).

Equations, Number of Observations / Variables	1, N=71	2, N=70	3, N=71	4, N=69	5, N=71
Constant	6.9***	5.7***	9.0***	7.5***	8.8***
PPP GDP per capita in 1999, $	.00004***	.00003***	.00007***	.00007***	.00007***
Life expectancy in 2002, years				-0.04***	-0.03***
Increase in life expectancy in 1970-2002, years	0.04***	0.04**	0.08***	0.08***	0.06***
Suicide rate per 100,000 inhabitants in 2002					-0.02***
Murder rate, 2002 per 100,000 inhabitants	0.02***		0.02***	0.02***	0.005***
Transition dummy variable (equals 1 for China, Eastern European and former Soviet Union countries, 0 for all other countries)	-0.54***	-0.56**			
Gini coefficient of wealth distribution around 2000[3], %		0.02**		0.02**	
Adjusted R2, %	48	54	60	62	65

*, **, *** – Significant at 1%, 5%, and 10% level respectively.

The positive relationship between inequality and happiness index scores can be seen in figure 3, which uses data from around the year 2000. However, more recent data (2010-2018) provide a different picture: Figure 4 suggests that happiness is higher in countries with lower levels of income inequality. But in multiple regressions, after controlling for per capita income and life expectancy, income inequalities, as table 1 shows, have a positive impact on happiness, when they go hand in hand with murder rates.

The positive relationship between the murder rate and the happiness index score in 2000 can be seen with the naked eye in figure 4.

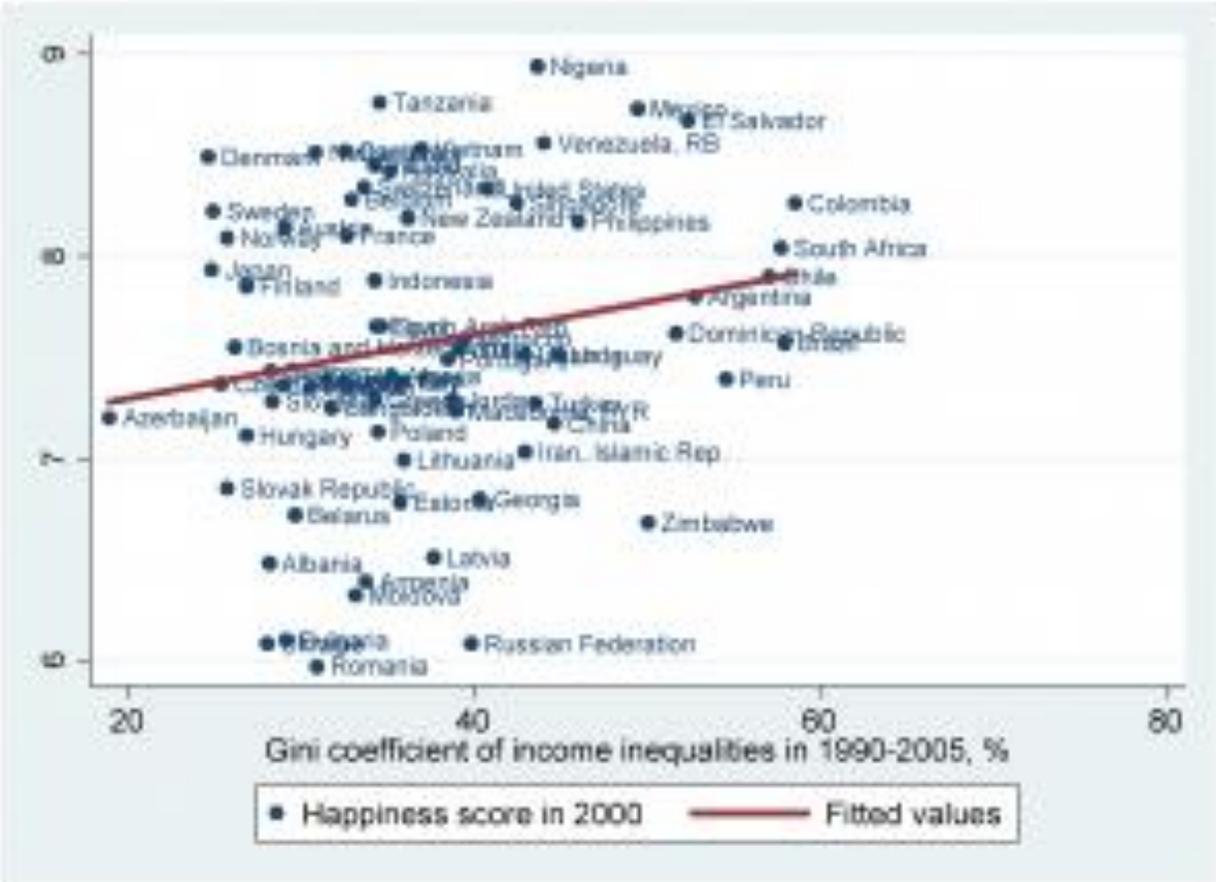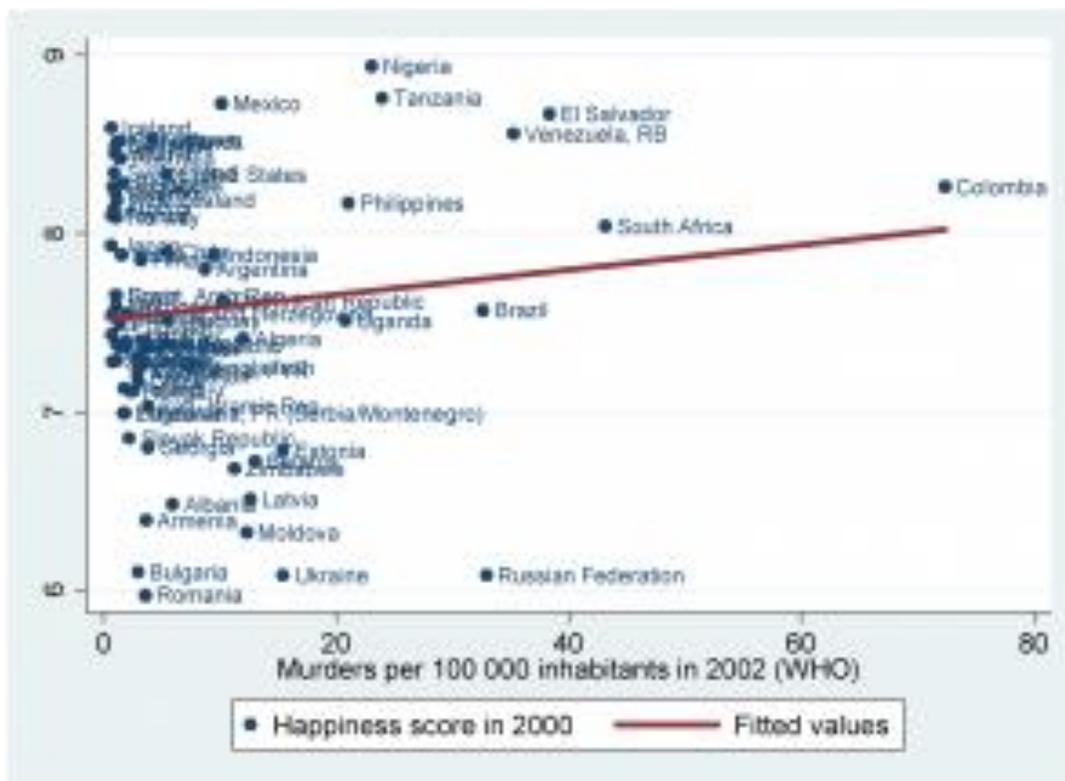**Figure 3: Gini coefficient of income inequalities and happiness index around 2000**
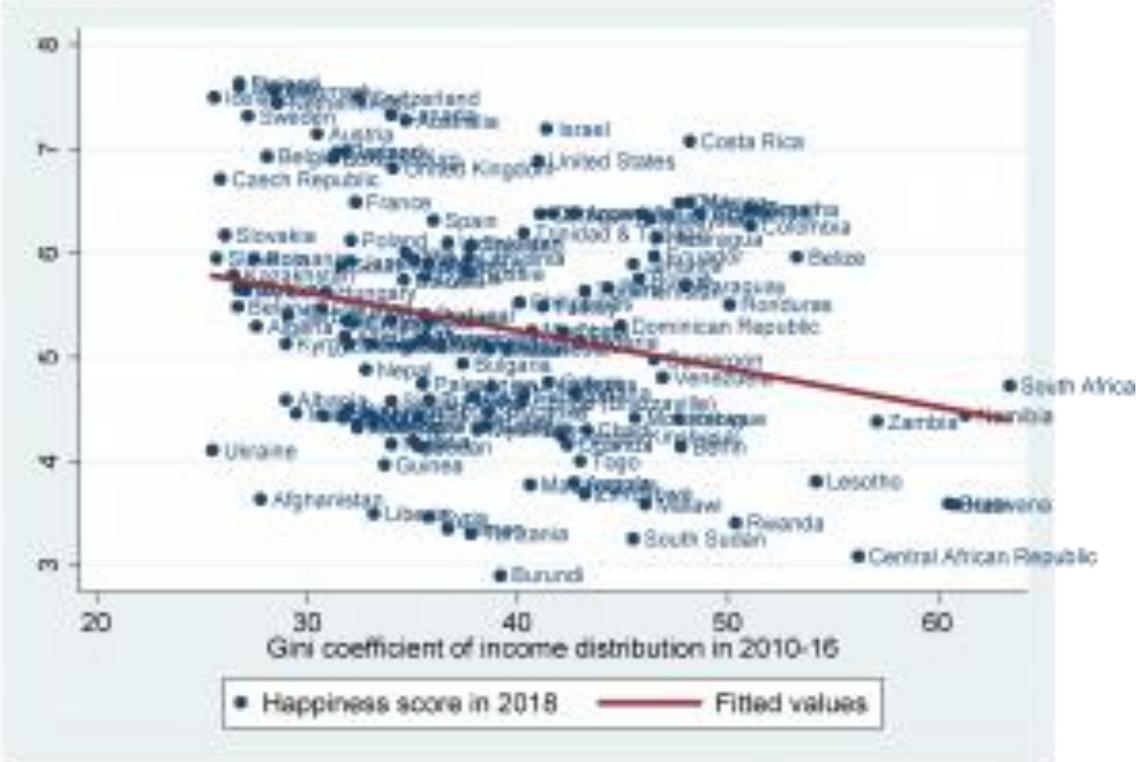
Figure 4: Gini coefficient of income inequalities and happiness index in 2010-18

Source: WDI database; Helliwell, J., Layard, R., & Sachs, J. (2018).

Figure 5: Happiness score and murder rate at around 2000

Source: WDI database; WHO.

Suicides: An alternative measure of (un)happiness

Suicides are often seen as an objective measure of (un)happiness. If polls suggest that happiness is high in a country, locality, community, or population cohort, but suicides are high as well, it most probably means that answers to certain survey questions cannot be taken at face value.

As figure 6 shows, in 2000 there was a clear negative relationship between happiness scores and suicide rates. In 2018, this relationship is less pronounced: The happiness index is correlated negatively and significantly with suicides, but the correlation coefficient is very low (1%; equation 1 in table 3). One of the determinants of the happiness index – healthy life expectancy – is more strongly correlated with suicide rates than the others (fig. 7).

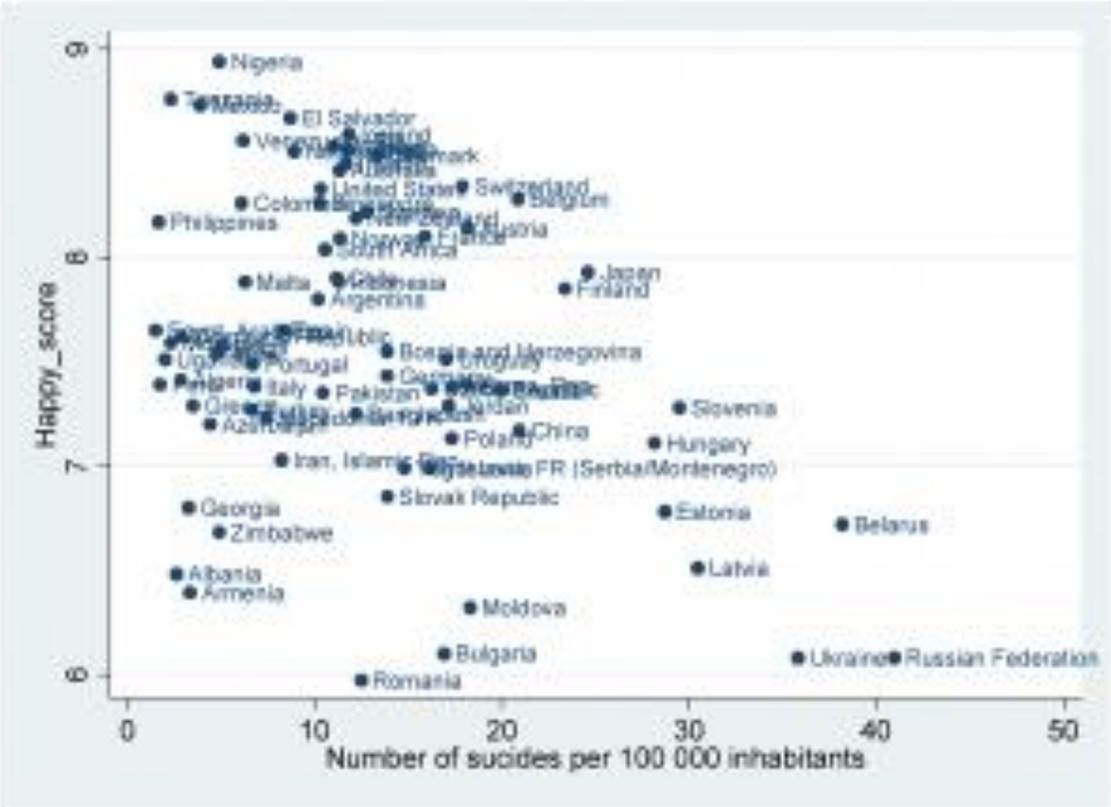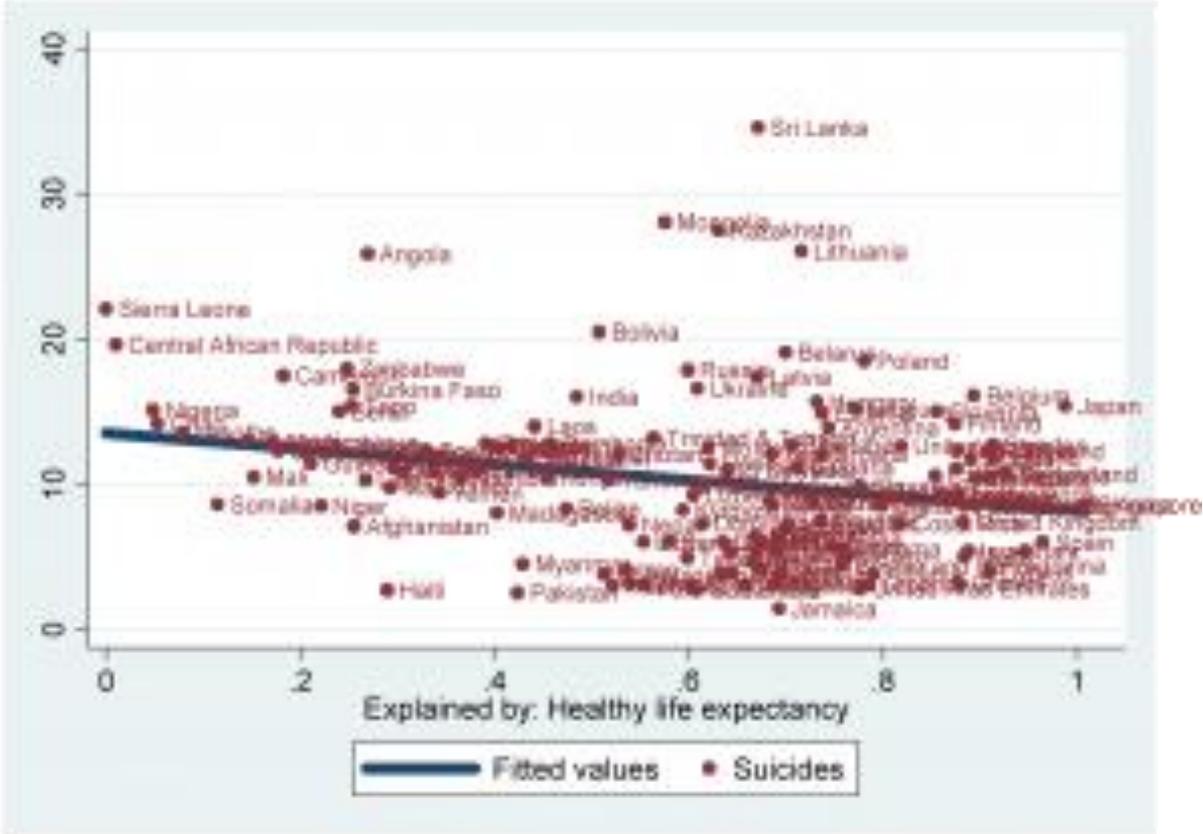**Figure 6: Suicide rate per 100,000 inhabitants and the happiness index around 2000**

Figure 7: Suicide rate per 100,000 inhabitants and the happiness index explained by healthy life expectancy in 2016-18

Source: Suicides in Helliwell, J., Layard, R., & Sachs, J. (2018).

In multiple regressions (table 3), suicides, after controlling for healthy life expectancy and social support indices, are strongly and negatively related to inequalities in income distribution and to the interaction term between inequality and murders in the 2016-18 period. Cross-country regressions for the year 2000 (table 4) suggest that inequality in income and wealth distribution affects suicides positively, whereas a

high murder rate tends to lower the suicides rate – blaming others for personal problems rather than oneself.

Table 3: Regression results of suicide rate in relation to per capita income, life expectancy, and other determinants in 2016-18; robust estimates. Dependent variable, suicide rate per 100,000 inhabitants.

Equations, Number of Observations / Variables	1, N=150	2, N=140	3, N=140	4, N=140	2, N=140	3, N=140
Constant	13.4***	14.5***	19.1***	9.0***	15.3***	9.5***
Happiness score from 0 to 10 in 2018	-0.6*					
Happiness score from 0 to 10 explained by **PPP GDP per capita in 2017** in 2011 dollars					3.9*	3.3 (significant at 15%)
Happiness score from 0 to 10 explained by healthy life expectancy in 2016		-5.9***	-6.8***	-13.5***	-17.6***	-17.0 ***
Happiness score from 0 to 10 explained by social support				8.5***	6.2***	7.4***
Gini coefficient of income distribution around 2016, %			-.12**		-.14***	
Interaction term (Gini coefficient*Murder rate)		-.001*		-.002**		-.002**
Adjusted R2, %	1	7	8	18	19	19

*, **, *** – Significant at 1%, 5%, and 10% level respectively.

Table 4: Regression results of suicide rates in relation to per capita income, life expectancy, and other determinants around 2000; robust estimates. Dependent variable, suicide rate per 100,000 inhabitants.

Equations, Number of Observations / Variables	1, N=122	2, N=115	3, N=115	4, N=122	5, N=115
Constant	6.35	25.8***	24.7**	-1.6	7.4
Log PPP GDP per capita in 1999, $	5.1***	4.6***	5.5***	4.7***	5.8***
Increase in life expectancy in 1970-2002, years	-0.3**	-0.4***	-0.4***	-0.2*	-0.19**
Transition dummy variable (equals 1 for China, Eastern European and former Soviet Union countries, 0 for all other countries)				8.3***	8.5***
Gini coefficient of income distribution around 2000, %	-0.5***	-0.2**	-0.2***	-0.1**	-0.15**
Gini coefficient of wealth distribution around 2000, %			-0.4**		-0.2*
Murder rate, 2002 per 100,000 inhabitants	0.2**		0.2**		0.2**
Adjusted R2, %	32	33	37	40	48

*, **, *** – Significant at 1, 5 and 10% level respectively.

Figure 8: Gini coefficient of income inequalities and suicide rates per 100,000 inhabitants, around 2000
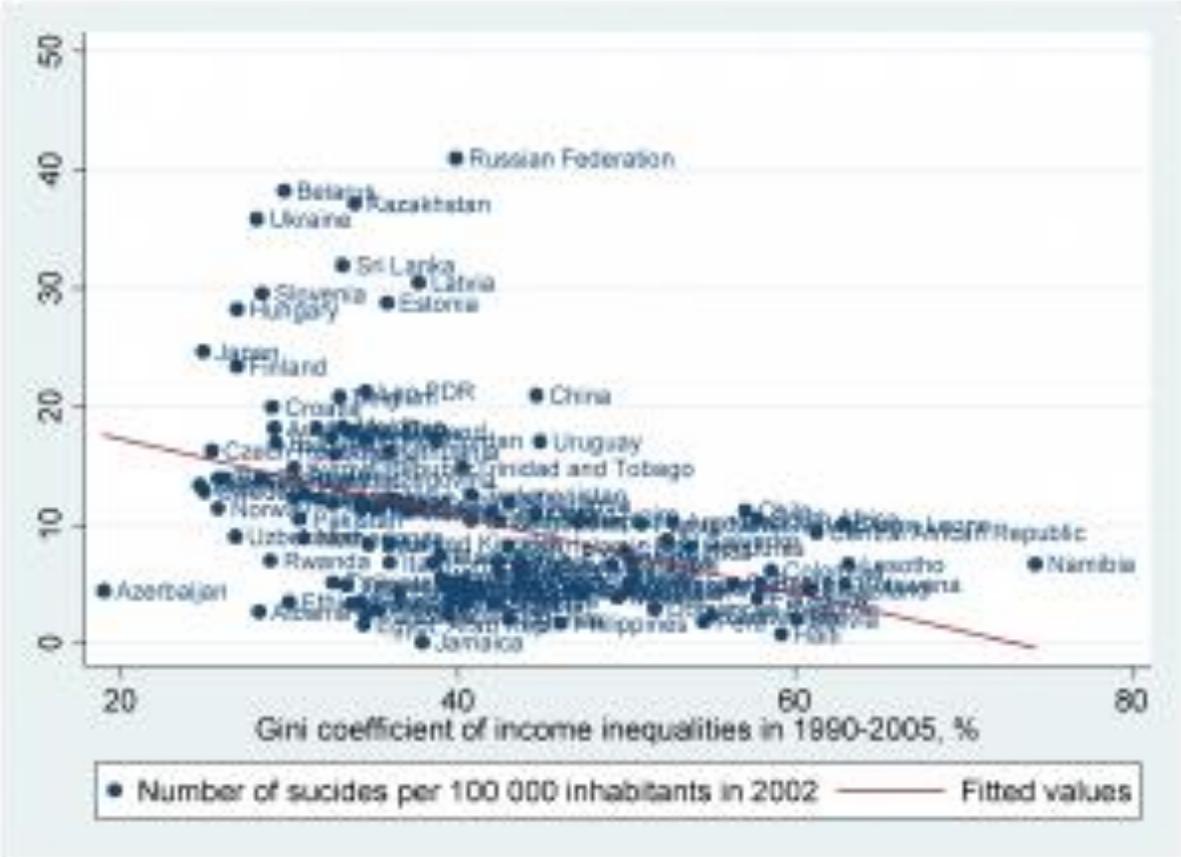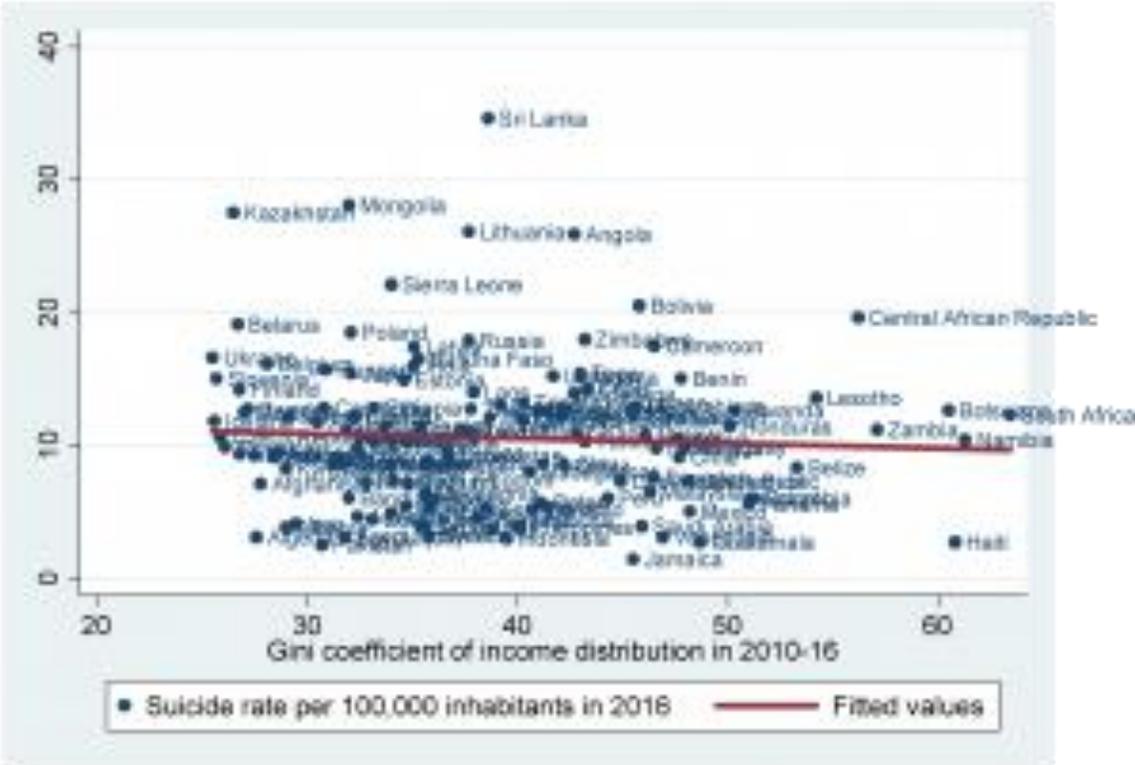
Figure 9: Gini coefficient of income inequalities and suicide rates per 100,000 inhabitants in 2010-16

Source: Suicides; WDI database.

Hypotheses

The 'big fish in a small pond' effect is actually a model (Marsh and Parker, 1984) that was developed to explain why good students prefer to stay in a class in which they are above the average level, rather than be in a more challenging learning environment, where they are below the average level. This effect can be used to explain one of the paradoxes of happiness: Strong growth is usually accompanied by

growing income inequalities (fig. 10), so rapid growth is often associated with low happiness scores (fig. 11).

A paper by Brockmann, Delhey, Welzel, and Hao (2008) refers to the concept of "frustrated achievers" and explains the decline in happiness scores in China by the deterioration of relative incomes for the majority of the population due to rises in income inequality.

The findings of this paper are different: Income inequality raises happiness rather than lowers it, whereas a decline in inequality makes people feel miserable. Two explanations, which probably do not contradict one another if we separate stock and flow effects, are as follows: With low levels of inequality people feel unhappy – the dream of the 'big fish in a small pond' is out of reach – but the transition to higher levels of inequality, when the relative position of the majority deteriorates in relation to the average, makes people even more unhappy temporarily, during the transition. When transition to the higher level of inequality is over, people – maybe new generations – start to feel happier.

This hypothesis is supported by the significant negative impact of a transition dummy variable on happiness (table 2) and the negative impact on suicides (table 4). This transition dummy variable is equal to 1 for all countries with a communist past and 0 for all other countries. In all transition economies there was an unprecedentedly rapid and considerable rise in income and wealth inequalities in the 1990s (after 1985 in China) and this rise had a depressing effect on happiness and caused more suicides. But the *level* of inequalities exhibits a positive

and significant impact on happiness – it is negative on suicides – suggesting that after transition to these high levels is made, inequality becomes good for happiness and suppresses suicides.

Figure 10:[4] Decrease in poverty rate, 1990-2010, due to growth of mean income and an improvement in income distribution, p.p.
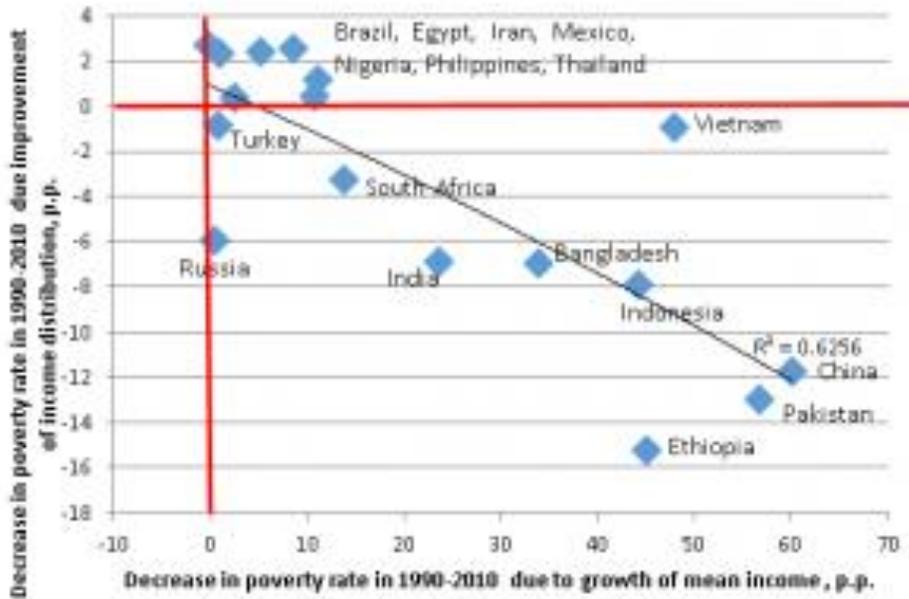
Source: Statistics from POVCAL; Figure created by the present author.

Figure 11: Happiness score in 2000 and annual average growth rates of GDP per capita in 1960-99, %
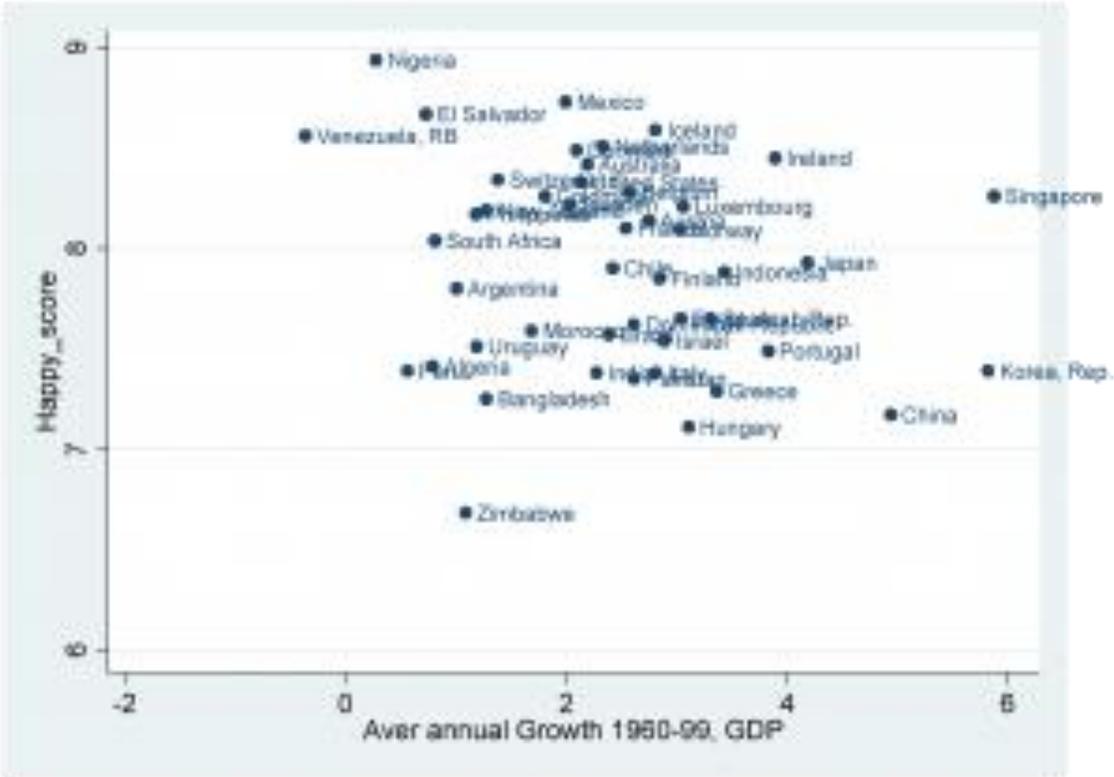
Source: Helliwell, J., Layard, R., & Sachs, J. (2018); WDI database.

Conclusions

Income inequality and murders increase happiness and cause suicides rates to fall – this is a controversial, but robust finding of this paper, which has not been reported in previous literature to the best of my knowledge. This conclusion apparently contradicts prior results regarding the negative impact of inequality on happiness. The decline in happiness in China and many other countries with growing incomes and life expectancy is explained by growing inequality, which caused

the *relative* position of most people to fall, even though absolute levels of incomes and life expectancy were growing – the big fish in a small pond effect.

My result, however, may be consistent with previous research, if the distinction between levels and change in levels of inequality (stock and flows) is taken into account. The hypothesis is that a low level of inequality kills peoples' 'dream' of being a big fish in a small pond, so that they feel unhappy and suicide rates rise. As a society transitions to a higher level of inequality, the transition makes most people even less happy because their relative position in terms of average income deteriorates. But when the transition is over, happiness increases and suicide rates fall because the rise in inequality comes to an end and the newly high levels of inequality allow people to hope that one day they will reach the very top.

Another result is that murder rates affects happiness positively and suicide rates (an objective measure of unhappiness) negatively, either by itself or through interaction with high levels of inequality. One reason may be perceptions of social justice – i.e., murderers blame others; those who commit suicides blame themselves. Another possible reason –is that when inequalities are high and perceived as unfair, murders and crime are viewed as acceptable, i.e., as a correction of government failure to ensure social justice.

The idea for future research is to use panel data (Forbes data are available from 1996) to test the hypothesis that low income inequalities cause unhappiness, their subsequent increase initially

makes people even less happy, but eventually, when the level of inequalities stabilises at a high level, happiness increases. This should be possible due to a sort of natural experiment – the rapid increase in inequalities in the 1990s in post-communist countries.

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[1] 'Happiness score explained by corruption' is not a corruption index per se, but a part of the happiness score that is explained by corruption (from the regression equation in which corruption influences happiness negatively). So in table 2 and other tables, a positive sign of 'Happiness score explained by corruption' means that corruption affects happiness negatively.

[2] Murder rate statistics are taken from homicide articles on Wikipedia.

[3] Gini coefficient of wealth distribution is taken from Davies, Sandstrom, Shorrocks, and Wolff (2007).

[4] POVCAL enables the calculation of poverty rates under different assumptions. In order to separate changes in poverty due to income growth and changes due to the distribution, I follow four steps:

1. Compute the actual reduction in the poverty rate (people with monthly income of $38 in 2005 prices at PPP rates) from 1990 or a nearby year to 2010;
2. Compute the actual increase in mean real income;
3. Estimate the minimum income in 1990 sufficient for getting out of poverty by 2010, just due to increases in income, holding income distribution constant ($38 / increase in average income in 1990-2010) – critical poverty line;

4. Compute the poverty rate in 1990 for the minimum income needed to get out of poverty by 2010 (critical poverty line) and assume that all people that had higher incomes exited poverty only due to the actual growth of average income.

The difference between the actual poverty rate in 1990 and the poverty rate for the critical poverty line is the share of people that escaped poverty only as a result of a growth of average income, without changes in the distribution of income. The difference between the actual reduction of the poverty rate in 1990-2010 and the share of people that escaped poverty due to the growth of income is the share of people that escaped poverty due to better (more even) income distribution (holding the growth of average income constant). If this number is negative, it means that the distribution of income deteriorated and the poverty rate increased because of this deterioration. In most cases, the growth of average income was enough to over-compensate for this deterioration, so that the overall poverty rate declined.

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