



Do Suicide Rates Correlate with the Gini Coefficient and Gross Domestic Product?

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Abstract

This paper uses a least squares regression model to investigate the relationship between suicide rates, the Gini coefficient, and gross domestic product (GDP). It looks to build the basis for challenging contemporary economic theory's emphasis on GDP and other traditional methods of measuring human welfare. Suicide rates are considered to be inversely related to human welfare and thus to GDP, while Gini coefficients are similarly seen as negatively correlated to welfare and *ceteris paribus*. The result of the study was statistically inconclusive.

Keywords: Suicide Rates, Gross Domestic Product, Human Welfare, Macroeconomics, Gini Coefficient

1. Introduction

This paper uses a least squares regression model to investigate the relationship between suicide rates, the Gini coefficient, and gross domestic product (GDP). Contemporary economic theory places its primary emphasis on GDP and related measures hinged on the principles of Jeremy Bentham's utilitarianism that greater utils cause more happiness. Conversely, suicide indicates a point where a person does not believe life itself has value or utility or utils generating capacity. The Gini-coefficient measures inequality in society, which too can be assumed to impact negatively to human welfare.

This research is written on the supposition suicide rates inversely measure real human welfare, as the act of taking one's life is the ultimate breakdown of the social contract within a society and an indication that such people do not expect to gain welfare and utility from life itself. We consider suicide rates as the best estimate of a society's overall welfare.

To explain, let one considers the micro-level. A person is willing to kill him or herself only in the extreme cases where their welfare is either very low or negative. They also generally have the view that life cannot get better. The number of individuals in society that commits suicide can measure how well society's welfare mechanism has worked. Thus, to illustrate an extreme dichotomy, a Japanese worker who works intensely for all his life and barely enjoys his wealth but keeps it in a savings account may have the better medical treatment and have quality education and civic necessities. He may have all these and generate significantly greater GDP than, in comparison, a Jamaican sleeping under a tree. Yet, can the former be considered to have lived a more fulfilling life than the latter? In other words, is the former better off than the latter? GDP and similar measures would answer to the affirmative, and suicide rates would not.

2. Literature Review

The relationship between suicide rates and income has been studied a number of times and the results have generally established an inverse relationship between them; as income goes up, suicide rates go

down. Our literature review starts in the 19th Century in France. Perlin (1975) noted that, between 1840 and 1850, suicide was believed to be an urban phenomenon in Paris and related to poverty and occurred more frequently among laboring poor which was repeated by many writers.

Broadly, there are three theories that suggest the relationship between economics and suicide. The first is illustrated by Durkheim (Durkheim, 1897) in 1897, who proposed that society constrains the individual in two ways: By social integration and social regulation. The former attaches purpose and ideals while the latter regulates their desires and aspirations. He discussed how suicide is affected accordingly (Taylor, 1982. p. 13).

The second theory connects suicide to economic cycles, suggesting that suicide is pro-cyclical (Ginsberg, 1966). The third theory suggests that suicide is counter-cyclical; recession increases suicides and booms decrease suicides (Ogburn and Thomas, 1922; Thomas, 1927; Dublin and Bunzel, 1933; Henry and Short, 1954). Yang (1992) suggested that the best articulated of the last group is Henry and Short's and uses this work as representative of the group. This dissertation follows suit.

There is a notable difference of approach between those such as Durkheim (1897) who proposes that the impact of economics works indirectly by affecting the social system and this, in turn, affects the suicide rate, while the other two categories postulate a direct relationship between economics and suicide rates¹. Our study assumes the latter of the two approaches.

With regard to inequality, the principle measure of previous studies has been unemployment. Platt (1983) did a full review of recent empirical research connecting suicide with the unemployment rate. Some of the more significant researches on suicide and unemployment include Ever (1977) and Boor (1980).

Henry and Short (1954) proposed a frustration-aggression theory whereby economic well-being reduces frustration aggression. They focus their research on the business cycle. The study conclusively demonstrates a relationship between unemployment and suicide rates before 1942.

Several studies on suicide have shown the impact of society on suicide rates with other alternative variables. Brenner (1979) used data from 1940 to 1973 and found a relationship between suicide and economic growth trend and welfare expenditure. He later also found a relationship between suicide and real per capita income exponential trend (Brenner, 1983).

Stack (1978) have combined unemployment rates with social variables. In our opinion, Yang (1992) is the best example of this category of research and combines per capita gross national product, the unemployment rate, the divorce rate, the proportion of population which is Catholic, and the female labor force participation rate. He finds the impact of unemployment to be modest, finds strong statistical support for the divorce rate, and finds the opposite result to Durkheim (1897) with regard to the impact of a Catholic populace Yang (1992), i.e. larger the Catholic population, higher the suicide rate.

Pampel (1998) also combined both sociological and economic variables but focused on the institutional adjustment of sex differential.

Hamermesh and Soss (1974) conclude that economics is only a portion of the calculus of suicide. Their analysis suggests the same proportionate increase in suicide from mild cycles post-WWII as the pre-WWII stronger cycles. The study finds an inverse relationship between suicide rates and income.

Marcotte (2003) discussed the controversy of whether suicide can be a rational economic choice, focusing on the gray area of unsuccessful suicide. The study finds that there is a statistically significant income boost after an unsuccessful suicide attempt. This is a counter-argument which could lead to research on suicide attempts as a factor to economic well-being and can further complicate the analysis.

1 Yang (1992) describes this direct relationship in terms of technological breakthroughs, increases in knowledge, improvements in social and economic systems, all of which lead to better material wellbeing, better public health, better education, etc.

3. Data, Methodology, and Results

The variables used and their definition are as follows: Real GDP per capita, denoted GDP is used as the default economic variable that impacts suicide rate (S). Gini coefficient (Gini) is an added variable that we wish to test as an independent variable that possibly also affects the suicide rate (S).

Data are obtained from the U.S. Bureau of Economic Analysis (2010) for GDP and the US National Center for Health Statistics (1970-1998) for suicide rates. Gini coefficient data are obtained from the United Nations University–World Inequality Database for Economic Research (2010). Our data are constrained by the availability of Gini data and cover the period of 1970-1991, as the UNU/WIDER database is presently incomplete and has multiple missing data points.

3.1. Unit root tests

We use the Augmented Dickey–Fuller unit root tests to check whether our data are stationary. We find that the data are stationary at the first difference $I(1)$.

Null hypothesis: D (LOG (GDP)) has a unit root		
Exogenous: Constant		
Lag length: (Automatic based on SIC, MAXLAG=4)		
Variable	t-Statistic	P
GDP	-3.137607	0.0398
Suicide	-3.516863	0.0198
Gini	-4.118234	0.0052

GDP: Gross domestic product

More specifically, the data are stationary at the first difference and at the 5% level of significance.

3.2. Regression test

We attempt the regression form:⁷

$$Suicide = \beta(GDP) + \alpha(Gini) + c$$

Our regression result is as follows:

Dependent variable: LOG (SUICIDE)				
Method: Least Squares				
Date: 10/26/10 Time: 19:51				
Sample: 1970 1991				
Included observations: 22				
Variable	Coefficient	SE	t-statistic	P
LOG (GDP)	0.212900	0.224140	0.949853	0.3535
LOG (GINI)	0.093747	0.636531	0.147279	0.8844
R ²	-0.193633	Mean dependent var		2.500674
Adjusted R ²	-0.253315	S.D. dependent var		0.039953
S.E. of regression	0.044728	Akaike info criterion		-3.289940
Sum squared resid	0.040011	Schwarz criterion		-3.190754
Log likelihood	38.18934	Durbin-Watson stat		0.643861

SE: Standard error, GDP: Gross domestic product

We note that our regression is not statistically significant. We, therefore, do not go further in analyzing the cointegration or consider causality, etc.

4. Conclusion

We find that our data and model do not provide appropriate results for the contention that there is a link between suicide rates and GDP and the Gini coefficient. Perhaps, we need to rethink our model specification and improve the quality and quantity of the data set. Another possibility is that the Gini coefficient data set has too many independent variables acting on it. It may be better to work out all exogenous variables affecting suicide rates taking other factors such as political and social factors in addition to GDP and inequality.

5. References

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- (Endnotes)