

INCOME INEQUALITY AND THE SUICIDE RATE IN JAPAN: EVIDENCE FROM COINTEGRATION AND LA-VAR

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Using time series techniques, this paper examines the relationship between the suicide rate and income inequality in Japan. Since both the suicide rate and income inequality (Gini coefficient) in Japan are integrated of order one for the sample period 1951–2007, the existence of cointegration is a prerequisite for the successful modeling of their relationship. The Durbin-Hausman test shows that the suicide rate is cointegrated with income inequality and the unemployment rate. The dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) methods demonstrate that income inequality and the unemployment rate are positively and significantly related to the suicide rate in Japan, and there is evidence supporting the parameter stability of our suicide model. Furthermore, the lag-augmented vector autoregression (LA-VAR) approach shows that there exists unidirectional Granger-causality from income inequality to the suicide rate. Hence, the fluctuations in Japan's suicide rate are partially explained by income inequality.

JEL classification codes: C22, I10

Key words: suicide, income inequality, time series, cointegration, LA-VAR

I. Introduction

Since the early 1990s, the suicide rate in Japan has increased remarkably, escalating from 16.1 (per 100,000 people) in 1991 to 25.4 in 1998—an approximate 60% rise within the short span of 8 years. Furthermore, in 2000, the suicide rate in Japan was the highest among the developed countries, excluding Russia and the central and eastern European countries. The World Health Organization (WHO) reported that the overall suicide rate in Japan was 24.1 in 2000; this figure was higher than those

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of most other developed countries such as Canada (11.7), France (18.4), Germany (13.5), Italy (7.1), the U.K. (7.2), and the U.S. (10.4). These facts have generated considerable concern among Japanese policy makers (e.g., Cabinet Office 2007). However, the determinants of suicide in Japan are still a matter of debate.

To illustrate the nature of the suicide problem in Japan, it is important to provide theoretical explanations of its determinants. In this regard, Daly, Wilson, and Johnson (2007) and Daly and Wilson (2009) point out the importance of interpersonal income comparisons. They argue that suicide data can be used as a direct measure to assess utility, and their theoretical model predicts that an individual commits suicide when his/her current and expected future utility is less than the perceived utility of committing suicide. If individuals compare themselves to others to determine their own utility, a deterioration of their relative position may lead to a decrease in their perceived utility and, consequently, to an increase in their suicide risk. In this respect, interpersonal income comparisons seem to be a useful measure for examining the determinants of suicide. Specifically, if an individual's utility does indeed depend on relative income as Daly, Wilson, and Johnson (2007) and Daly and Wilson (2009) demonstrate empirically, then an increase in the income of an individual has a negative impact on others since it deteriorates their relative positions. In other words, an increase in income inequality may lead to an increase in suicide risk for the less well-off individuals in the community.¹ Hence, from this perspective, it seems reasonable to suppose that income inequality is one of the determinants of suicide.

This paper addresses the question of whether income inequality in Japan affects the suicide rate. In the literature on the relationship between income inequality and suicide, little attention has been paid to the case of Japan. The prevention of suicide is an important issue in Japan, since it has one of the highest suicide rates in the world. In this light, an investigation of the relationship between income inequality and suicide in Japan seems significant; moreover, such an investigation could provide useful information to those responsible for formulating the Japanese policy on mental health care.

This paper examines the relationship between the suicide rate and income inequality in Japan by using time series techniques. As Figure 1 indicates, the suicide

¹ It is likely that individuals also take into consideration those who earn less than themselves. The existence of such downward-looking comparisons implies that an increase in income inequality improves the well-being of individuals at the top of the income distribution, which could offset, at least partially, the negative impact of income inequality on those at the bottom of the distribution. Hence, it seems more appropriate to regard the negative impact of income inequality on well-being as a net negative impact.

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