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Abstract

Based on survey data from Japan, empirical results show that stock prices in the graduation year of university students are negatively associated with the probability that those individuals will consider suicide many years after graduation.

Keywords: Graduation year; Recession; Stock price; Suicide; Subjective perception.

JEL classification: I12; I39; E60; Z10

1. Introduction

Researchers are paying increasing attention to the economic conditions existing when individuals complete their tertiary education. Many studies provide evidence that employees who leave school during a period of economic recession have persistently lower wages and earnings than otherwise similar employees (e.g., Oyer, 2006; Genda et al., 2010; Kahn, 2010; Hershbein, 2012; Oreopoulos et al., 2012). The long-term effect of economic recession has a detrimental effect on consuming behavior. Males who graduate from school during an economic downturn are more likely to be heavy drinkers (Maclean, 2015) and smokers (Cultler et al., 2014). In addition, experiencing an economic recession while young has been shown to influence an individual's perception regarding economic issues (Giuliano and Spilimbergo, 2015). Graduating in times of poor economic conditions is associated with lower life satisfaction (Cultler et al., 2014). Based on these previous studies, the following hypothesis is proposed: graduating under severe economic conditions has a long-term effect on the mental health of individuals, and can lead to thoughts of suicide.

Economic downturn is observed to increase suicides (e.g., Koo and Cox, 2008; Chen et al., 2009). However, existing studies have not investigated the long-term effect of economic recession on suicide. Hence, this paper deals with the long term effect. In addition, people who have actually committed suicide are rare even if many people thought of committing suicide.. However, previous research has not investigated the experience of considering suicide. Using survey data from Japan, this paper attempts to explore the long-term effect of economic conditions at

graduation on thoughts of suicide many years after graduation.

2. Data and Model

This paper used individual-level data from Japanese General Social Surveys (JGSS).[1] Data collected in 2006 are used because only the 2006 survey included a question regarding suicidal feelings. In addition to information about contemplating suicide, the data cover information related to marital and demographic (age and sex) status, annual household income, years of schooling, age, prefecture of current residence, and employment status. Using this information, the year in which respondents completed tertiary education can be obtained. Definitions of and basic statistics used for estimations are shown in Table 1. The respondents' ages range from 20 to 89. Hence, the year lags between the survey year and year of graduation widely vary. This enables the identification of the long-term effect of economic condition at graduation on suicide. The estimated function of the baseline model takes the following form:

$$OSUICID_i\ (SUICID_i) = \alpha_1 HIGH_{it} + \alpha_2 HIGHUP_{i,\,t+5} + \alpha_3 LOW_{it} + \alpha_4 LOWUP_{i,\,t+5} + \alpha_5 SCHOOL_i + \alpha_6 INCOM_i + \alpha_7 UNEMP_i + \alpha_8 AGE_i + \alpha_9 MALE_i + \alpha_{10} MARRY_i + \alpha_{11} CHILD_i + u,$$

where i is the individual and t is year that the individual completed tertiary education. Furthermore, $t+5$ shows the period between t and $t+5$. Regarding

[1] Data for this secondary analysis, "Japanese General Social Surveys (JGSS), Ichiro Tanioka," were provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

dependent variables, the 2006 JGSS included a variable to capture experiences regarding suicidal thoughts. One of the survey questions asked, "In the past 5 years, have you thought of committing suicide at least once?" Respondents could choose one of three responses: 1 (Never), 2 (Not in the past 5 years but have before that), or 3 (Yes). Based on these responses, the experience of considering suicide, even if suicide was not committed, can be quantified. Values for *OSUICID* range from 1 to 3; thus, an ordered probit model was used to conduct the estimations (Greene, 2008). The larger the value of *OSUICID*, the more people are likely to consider suicide. Furthermore, as an alternative specification, *SUICID* (having 1 if *OSUICID* is 1 otherwise 0) is used as a dependent variable. In this specification, a probit model is used.

The key independent variables are proxies to capture economic conditions at graduation: the highest and lowest stock prices in the year when the respondent completed their tertiary education. In addition, to capture the change of economic conditions after graduation, dummies are included, having 1 if the highest (lowest) stock prices increased within 5 years of the year of graduation. Annual income level and unemployment dummies are included to capture the respondents' economic conditions in the year when they completed the survey. Therefore, economic conditions at graduation can be separated from the current economic condition. Various control variables are also included.

3. Results

The results of the ordered probit estimations are reported in Table 2 and those of the simple probit model are shown in Table 3. Regarding the results of the key

variables, in each table the values without parentheses suggest a marginal effect on the probability that a respondent considered suicide in the past 5 years. Table 2 shows that *HIGH* and *LOW* are negative and statistically significant with the exception of *LOW* in column (1). This implies that people are less likely to consider suicide if the highest stock prices and the lowest stock prices are higher at the year of graduation. The absolute values of *HIGH* and *LOW* are around 0.02, which can be interpreted as suggesting that a 1,000-yen rise in the highest and lowest stock prices at graduation decreases the probability (by 2%) that respondents considered suicide in the past 5 years. However, *HIGHUP* and *LOWUP* are not statistically significant in any columns. An increase in stock prices after graduation does not influence thoughts of suicide. The results in Table 3 are similar to those in Table 2, suggesting that the estimation results are robust to alternative specifications.

4. Conclusions

This paper considered the long-term effect of macro-economic conditions at the time when individuals completed their tertiary education on thoughts of suicide. Key findings are that stock prices during a respondent's year of graduation are negatively associated with the probability that they will consider suicide. A 1000-yen increase in stock prices at graduation decreased the probability that respondents had suicidal thoughts in the past 5 years by 2%, even many years after graduation.

References

Chen, J., Choi.Y.J., Sawada, Y. 2009. How is suicide different in Japan? Japan and the World Economy 21. 140–150.

Cutler, D., Huang, W., Lleras-Muney, A, 2014. When does education matter? the protective effect of education for cohorts graduating in bad times. NBER Working Papers 20156.

Genda, Y., Kondo, A., Ohta,S. 2010. Long-term effects of a recession at labor market entry in Japan and the United States. Journal of Human Resources, 45(1) 157-196.

Giuliano, P. , Spilimbergo, A., 2015. Growing up in a recession. Forthcoming in Review of Economic Studies.

Hershbein, B. J. 2012. Graduating high school in a recession: Work, education, and home production. B.E. Journal of Economic Analysis & Policy 12(1): Article 3. doi: 10.1515/1935-1682.2599.

Kahn, L. B. 2010. The long-term labor market consequences of graduating from college in a bad economy. Labour Economics 17, 303–316.

Koo, J., Cox, W.M. 2008. An economic interpretation of suicide cycles in Japan. Contemporary Economic Policy, 26(1), 162-174.

Maclean, J.C. 2015. The lasting effects of leaving school in an economic downturn on alcohol use. Industrial Labor Relation Review. 68(1), 120-152.

Oreopoulos, P., Von Wachter, T., Heisz, A. 2012. The short- and long-term career effects of graduating in a recession. American Economic Journal: Applied Economics 4, 1–29.

Oyer, P. 2006. Initial labor market conditions and long-term outcomes for economists. Journal of Economic Perspectives 20, 143–160.

Table 1. Descriptive Statistics

Variables	Definition	Mean	SD	Max	Min
OSUICID	Question: In the past 5 years, have you thought of committing suicide at least once? Responses: 3 (Yes), 2 (Not in the past 5 years, but have before that), 3 (Never)	1.22	0.53	3	1
SUICID	1 if OSUICID is 1 or 2, otherwise 0	0.17	---	1	0
HIGH[a]	The highest stock price in the year respondent completed tertiary education	11.1	9.20	39.9	2.39
HIGHUP	1 if HIGH increased within 5 years of graduation year	0.09	---	1	0
LOW[a]	The lowest stock price in the year respondent completed tertiary education	8.2	6.34	30.8	1.94
LOWUP	1 if LOW increased within 5 years of graduation year	0.12	---	1	0
SCHOOL	Years of schooling	12.1	2.62	18	6
INCOM[b]	Household income[a]	6.11	4.17	2.3	0
UNEMP	1 if respondent is unemployed, otherwise 0	0.02	---	1	0
AGE	Age	52.3	16.6	89	20
MALE	1 if respondent is male, otherwise 0	0.45	---	1	0
MARRY	1 if respondent is married, otherwise 0	0.78	---	1	0
CHILD	Number of children	1.71	1.16	8	0

Notes: [a]Stock prices for 1949–2000. Source: http://indexes.nikkei.co.jp/nkave/archives/data (accessed March 7, 2015). The values are deflated using GDP deflator.

[b]Millions of Yen.

SD: Standard deviation.

Table 2. Regression results on considering suicide: dependent variable is *OSUICID* (ordered probit model)

	(1)	(2)	(3)	(4)	(5)
HIGH	−0.039**	−0.020**	−0.018**		
	(−2.00)	(−2.18)	(−2.30)		
HIGHUP	−0.186	−0.089			
	(−0.86)	(−0.68)			
LOW	0.030			−0.022*	−0.023*
	(1.12)			(−1.77)	(−1.88)
LOWUP	0.120			0.035	
	(0.63)			(0.32)	
SCHOOL	0.003	0.002	0.002	0.001	0.001
	(0.14)	(0.14)	(0.13)	(0.05)	(0.05)
INCOM	−0.042	−0.050	—0.048	—0.040	—0.042
	(−0.38)	(−0.45)	(−0.43)	(−0.36)	(−0.37)
UNEMP	0.062	0.048	0.039	0.034	0.037
	(0.13)	(0.10)	(0.08)	(0.08)	(0.08)
AGE	−0.030***	—0.032***	−0.030***	−0.028***	−0.029***
	(−3.84)	(−4.09)	(−4.35)	(−3.91)	(−4.07)
MALE	−0.047	−0.046	−0.049	−0.051	−0.050
	(−0.54)	(−0.52)	(−0.55)	(−0.56)	(−0.54)
MARRY	−0.367	−0.366	−0.363	−0.370*	−0.371*
	(−1.64)	(−1.63)	(−1.63)	(−1.67)	(−1.67)
CHILD	−0.029	−0.028	−0.029	−0.029	−0.029
	(−0.54)	(−0.52)	(−0.53)	(−0.52)	(−0.52)
Wald Chi^2	62.1	55.5	54.4	54.7	51.9
Obs.	950	950	950	950	950

Notes: Values without parentheses are the probability that the respondent chooses response 3 for the question regarding contemplating suicide. The reported values of *INCOM* (*SCHOOL*) are multiplied by 1,000 (10) for convenience of interpretation. Values in parentheses are z-statistics obtained by robust standard error clustered on residential prefecture. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively. In all estimations, dummies for size of residential place are included but their results are not reported.

Table 3. Regression results for considering suicide: dependent variable is *SUICID* (probit model)

	(1)	(2)	(3)	(4)	(5)
HIGH	−0.010*	−0.005**	−0.004**		
	(−1.86)	(−2.14)	(−2.30)		
HIGHUP	−0.044	−0.023			
	(−0.72)	(−0.61)			
LOW	0.008			−0.005*	−0.005*
	(1.07)			(−1.66)	(−1.75)
LOWUP	0.029			0.007	
	(0.51)			(0.24)	
Wald Chi^2	71.3	64.7	63.6	66.3	62.1
Obs.	950	950	950	950	950

Notes: Values without parentheses are marginal effects on the probability that the respondent chooses response 1. Values in parentheses are z-statistics obtained by robust standard error clustered on residential prefecture. *, **, and *** indicate significance at 10%, 5% and 1% levels, respectively. Set of all control variables used for estimations reported in Table 2 is included, but results are not reported.