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Accumulated Suicides in Korea since Economic Crisis in 1997: An Ecological Study

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Abstract

The economic crisis in 1997 has shocked Korean society in almost all aspects. The adverse effect of crisis has resulted not only in economic disasters but also in a notable range of social disorganization. Consequently, the suicide rate has increased in an unprecedented degree. Further, it has been witnessed that the elderly populations are the most severely victimized group regarding increased suicide rate. This research examines the differential suicide rates across age groups and investigates causes of this phenomenon. From an ecological analysis of recent suicide rates in Korea, we find relative cohort size significantly lowers the disadvantageous suicide rates of the elderly, consistent with the study by Pampel (1996).

Research Background

- Korea experienced a high economic growth for decades before the economic crisis in the late 1997.
- The impact of economic crisis, so called IMF bailout, was not just limited to the economic sphere of Korea. Rather, it has shocked and dismantled almost entire aspects of Korean society.
- There have been a number of studies on the economic impacts and consequences of the economic crisis that have been introduced and published domestically and internationally.
- However, studies on the consequence of economic crisis on other aspects of Korean society have been relatively fewer.
- Particularly, there have been very few attempts to analyze demographic consequences of the economic crisis in Korean society.
- We believe that one of the social aspects significantly but adversely affected by the crisis is social disorganization.
- Although social disorganization has been secondarily derived from economic disaster, it is generally reported that the influence of social disorganization to society overall is much mightier than that of economic disaster.
- Social disorganization includes changes in the family formation, increasing social disorder, a decreasing level of social trust and capital, etc.
- Social disorganization has known to be associated with the level of suicide.
- Indeed, according to the National Statistical Office of Korea, the suicide rate has increased from about 10/100,000 before 1997 economic crisis to 19.9 in

1998, to 14.6 in 2000 and to 19.1 in 2003.

- Therefore, in this research, we examine the changes and variations of suicide rate as an important social consequence of social disorganization associated with economic crisis in Korea.
- We focus on the differences in the suicide rate across age groups, because the extent to which economic disaster affect social disorganization and in turn suicide rate would be variable by age groups.
- In general, it is expected that economic crisis most critically affect working age groups involved in labor market, which makes us to assume that social disorganization happens to these age groups most extensively, which in turn, will results in increased suicide.

- But unlike this assumption, reports from the Korean National Statistical Office have shown that the suicide rate has incredibly increased after the economic crisis among the elderly population who are not included in the labor market (please see Figure 1).
- Therefore, this research has the following specific study aims.

Research Aims

- To examine in what extent recent suicide rate is different across age groups.
- To investigate the causes of differential suicide rates across age groups, particularly paying attention to the high-rising suicide rate of the elderly populations.
- To discuss the how findings from Korean society regarding economic crisis and the age-pattern of suicide contribute to the existing body of theoretical understandings of suicide.

Research Methods

- Unite of analysis: 15 Administrative Boundaries in Korea
- Data sources: Regional suicide rates by age and sex yearly reported by the Korean National Statistical Office in 2001, 2003, and 2003.
- Variables of main interest: Please see Figure 2

Main Findings

- From multivariate results, for both males and females, it is clear that the relative disadvantage of suicide rate among the elderly population almost disappears when the population proportion of each age group is included in the analysis, except for the age 80 and plus group.
- The interaction coefficients of relative population size and each age group indicate that the cohort size significantly and substantially lowers the suicide rates of elderly populations.
- Interestingly, unemployment rate lowers the risk of regional suicide rate for both males and females.
- Increased social disorganization, measured by the crude divorce rate, is associated with increased suicide rates.
- Metropolitan areas show significantly lower suicide rates than non-metropolitan areas.
- Much portion of increased suicide rate in year 2003 is associated with the increased crude divorce rate which is a proxy of social disorganization.
- High R^2 values suggest our models have power to explain the research questions of this research.

Figure 1. Trends of Suicide rate by age group in Korea

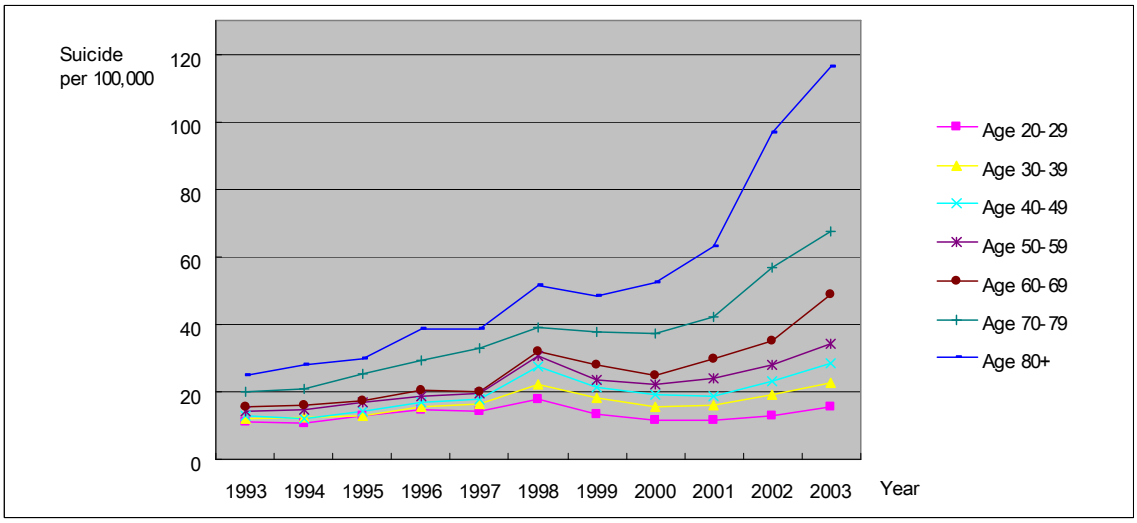

Figure 2. Measurement

Case: 627 (Male 314, Female 313)

Dependent Variable

Suicide rate of an age group in a unit area in 2001, 2002, and 2003

Independent Variables

Demographic Factor: Age group (dummy)

Population Proportion of Each Age group

Economic Factor: Unemployment Rate of a unit area in each year

Production per Capita of a unit area in each year

Female Labor Force Participation of a unit area in each year

Social Factor: Marriage Rate (Crude Marriage Rate) of a unit area in each year

Divorce Rate (Crude Divorce Rate) of a unit area in each year

Other Control Variables

Migration Rate of a unit area in each year (z)

Area: Metro-city and other (dummy)

Year: 2001, 2002, and 2003 (dummy)

Table 1. Descriptive Results of Suicide Rate by Independent Variables

	N	Mean
Age (Male)		
Age 20-29	45	18.19
Age 30-39	45	28.84
Age 40-49	45	37.40
Age 50-59	45	49.26
Age 60-69	45	62.39
Age 70-79	45	90.73
Age 80+	45	158.17
Total	315	63.57
Age (Female)		
Age 20-29	45	10.15
Age 30-39	45	13.28
Age 40-49	45	12.95
Age 50-59	45	13.15
Age 60-69	45	19.01
Age 70-79	45	39.30
Age 80+	44	59.44
Total	314	23.78
Area		
Metro-City	336	44.70
Other Province	293	42.57
Year		
2001	209	33.42
2002	210	42.49
2003	210	55.16

Table 2. Correlation Coefficients of Age-specific suicide rates and Independent Variables

	Mean	Coefficients	
Population Proportion			
Age (Male)			
Age 20-29	17.03	-0.451	***
Age 30-39	18.06	-0.650	***
Age 40-49	16.37	-0.093	
Age 50-59	9.34	0.036	
Age 60-69	6.86	0.055	
Age 70-79	2.73	-0.262	
Age 80+	0.75	-0.282	
Age (Female)			
Age 20-29	16.05	-0.570	***
Age 30-39	17.39	-0.540	***
Age 40-49	15.84	-0.452	**
Age 50-59	9.52	0.191	
Age 60-69	8.45	-0.015	
Age 70-79	4.73	0.045	
Age 80+	1.88	-0.420	**
Unemployment Rate	3.42	-0.068	*
Production per Adult	33082.00	0.047	
FLFP rate	49.16	-0.096	**
Crude Marriage rate	5.93	-0.001	
Crude Divorce Rate	3.00	0.208	***

p: * < .05, ** < .01, *** < .001

Table 3. Multivariate Results Regressed on the Logged Suicide Rates for Korean Males

	Model 1	Model 2	Model 3	Model 4	Model 5
	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)
Age 20-29	-.338***(.077)	-.457 (1.036)	-.937* (1.026)	-1.279** (1.013)	-1.567** (1.
Age 30-39	-.119** (.075)	.442 (.895)	.308 (.859)	.092 (.844)	.059 (.825)
Age 50-59	.134***(.075)	.229 (.851)	-.297 (.861)	-.350 (.86	-.670 (.8
Age 60-69	.227***(.075)	.348 (.750)	-.066 (.752)	-.173 (.75	-.412 (.7
Age 70-79	.387***(.075)	.615 (.730)	.231 (.728)	.112 (.727)	-.105 (.7
Age 80+	.627***(.075)	.898***(.727)	.534* (.723)	.406 (.721)	.202 (.717)
Size		-.110 (.043)	-.488 (.042)	-.663 (.04	-.869* (.04
Size * 20-29		.132 (.062)	.620 (.061)	.973* (.060)	1.265** (.06
Size * 30-39		-.555 (.053)	-.386 (.050)	-.154 (.05	-.102 (.04
Size * 50-59		-.138 (.066)	.252 (.067)	.241 (.067)	.486 (.067)
Size * 60-69		-.184 (.054)	.051 (.055)	.072 (.055)	.213 (.055)
Size * 70-79		-.332** (.069)	-.208* (.070)	-.214* (.07	-.138 (.07
Size * 80+		-.397***(.176)	-.335***(.176)	-.352***(.172)	-.312***(.172)
Unemployment			-.156* (.048)		-.113 (.0
Production			-.035 (.00		-.005 (.00
FLFP rate			-.131***(.007)		-.086** (.007)
CMR				-.084** (.036)	.067* (.037)
CDR				.254***(.061)	.218***(.063)
Migration rate	-.030 (.023)	-.003 (.02	-.010 (.02	-.009 (.02	-.013 (.02
Mega-City	-.133*** (.040)	-.230*** (.04	-.140* (.083)	-.281***(.045)	-.206***(.082)
Year 2002	.130*** (.049)	.141*** (.045)	.099** (.056)	.066* (.046)	.045 (.056)
Year 2003	.280*** (.049)	.302*** (.045)	.259***(.048)	.106** (.063)	.103** (.064)
df	314	314	314	314	314
R^2	.781	.819	.834	.842	.849
Constant	3.447*** (.063)	3.701*** (.698)	6.316***(.839)	4.227***(.658)	5.903 (.8

p: * < .05, ** < .01, *** < .001

Table 4. Multivariate Results Regressed on the Logged Suicide Rates for Korean Females

	Model 1	Model 2	Model 3	Model 4	Model 5
	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)
Age 20-29	-.125** (.083)	-.720 (.860)	-.836* (.864)	-.922* (.862)	-.987* (.867)
Age 30-39	.027 (.080)	-.284 (.727)	-.310 (.724)	-.335 (.719)	-.336 (.719)
Age 50-59	.014 (.080)	-.735* (.781)	-.867* (.831)	-.842* (.837)	-.938* (.870)
Age 60-69	.184***(.080)	-.166 (.689)	-.253 (.724)	-.237 (.728)	-.295 (.751)
Age 70-79	.521***(.080)	.079 (.678)	-.002 (.710)	.012 (.715)	-.041 (.735)
Age 80+	.688***(.081)	.655* (.672)	.577 (.703)	.580 (.707)	.530 (.727)
Size		-.644* (.040)	-.713* (.041)	-.715* (.041)	-.758* (.042)
Size * 20-29		.613 (.053)	.729 (.054)	.816* (.053)	.879* (.054)
Size * 30-39		.373 (.045)	.406 (.044)	.431 (.044)	.437 (.044)
Size * 50-59		.507 (.062)	.613* (.066)	.588 (.066)	.668* (.069)
Size * 60-69		.065 (.049)	.124 (.052)	.106 (.053)	.147 (.055)
Size * 70-79		.011 (.058)	.047 (.062)	.031 (.062)	.057 (.065)
Size * 80+		-.541***(.098)	-.519***(.105)	-.524***(.106)	-.509***(.111)
Unemployment			-.135* (.053)		-.112 (.0
Production			-.025 (.000)		-.010* (.000)
FLFP rate			-.038 (.008)		-.013 (.008)
CMR				-.060 (.042)	.-040 (.044)
CDR				.124** (.067)	.113* (.071)
Migration rate	-.052 (.02	-.029 (.02	-.033 (.024)	-.035 (.024)	-.038 (.024)
Mega-City	-.177***(.043)	-.257***(.054)	-.160* (.0	-.281***(.054)	-.196** (.0
Year 2002	.159***(.052)	.171***(.047)	.126** (.061)	.130***(.051)	.096** (.064)
Year 2003	.327***(.052)	.351***(.048)	.319***(.052)	.250***(.070)	.236***(.072)
df	313	313	313	313	313
R^2	.737	.790	.792	.795	.796
Constant	2.343***(.670)	3.674***(.620)	4.600***(.828)	3.712***(.619)	4.137***(.850)

p: * < .05, ** < .01, *** < .001