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Association between Macroeconomic Conditions and Health: Evidence from a Longitude Survey of Middle-aged Taiwanese

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Abstract

Objective: Macroeconomic conditions have significant effect on health of a population. It can improve health through an increasing amount of time spent on healthier behavior or deteriorate health due to an increase in job uncertainty and stress. The purpose of this study is to examine the association between macroeconomic conditions and health in Taiwanese middle-aged population.

Methods: This study uses the 1996-2003 Taiwan Longitudinal Study in Aging (TLSA), a longitude survey that collects health information from the middle-aged and elderly Taiwanese. To extract the analytic sample, the middle-aged respondents with full demographic and county of residence information were kept. A conditional logistic model was applied to the sample.

Results: This findings show that worsening macroeconomic conditions significantly improved health (OR=1.286; 95% CI=1.024-1.615; P-value=0.030). Moreover, the association between macroeconomic conditions and health is stronger in men (OR=1.391; 95% CI=1.029-1.881; P-value=0.032) and less-educated population (OR=1.536; 95% CI=0.936-2.523; P-value=0.090).

Conclusion: The findings implied that policymakers should implement public health policies to intervene when a macroeconomic condition is improving. In particular, the interventions should focus on men and less-educated population during the period.

Keywords: Macroeconomic conditions; Recession; Health; Middle-aged; Longitude surveys; Conditional logistics model; Taiwan

Introduction

A looming global economic recession in 2023 has renewed the interest of policymakers' in the relationship between macroeconomic conditions and health. On one hand, a recession could damage population health due to an increase in working hour and mental health disorders [1,2]. On the other hand, a recession could increase the free time that a person has and allows them to exercise and reduce heavy drinking [3,4]. Due to these facts, the association between macroeconomic conditions and health is ambiguous.

Previous studies shed light on the association between macroeconomic conditions and health in the United States, Europe and other OECD countries. Some researchers have showed that the association is pro-cyclical, implying that as recession hits health improves [5-22]. For example, Ruhm, et al. show that when unemployment rates decreased the physical health deteriorated [6]. Others suggested that the association is countercyclical, meaning that recession worsens the population health [23-29]. For instance, Astell-Burt and Feng, et al. show's that 2008's recession significant increased the incidence of cardiovascular and respiratory diseases [23]. Overall, the existing literature does not reach a consensus on the relationship. Moreover, the existing literature often lacks the focus on East Asia and middle-aged population.

To help filling in the gap, this study examines the association between macroeconomic conditions and health. Specifically, this study investigated the association between unemployment rates and self-reported health status in Taiwan using a longitude survey of middle-aged respondents in Taiwan from 1996 to 2003. To understand heterogeneity, the estimates were also stratified by gender and education levels.

This paper is organized as follows. Section 2 shows the overview of methods and material. Section 3 describes the results. Section 4 discusses the policy implications from this study.

Methods and Materials

Data source

This study leverages a longitude of elderly and near elderly individuals in Taiwan called the Taiwan Longitudinal Study in Aging (TLSA). It is a survey conducted by the Bureau of Health Promotion, Department of Health in Taiwan and designed to collect information on various health, behavior, healthcare and demographic information of non-indigenous Taiwanese

population of middle-aged and elderly population. The elderly respondents were first surveyed in 1989, while the middle-aged respondents were first surveyed in 1996. TSLA was conducted from 1989 to 2003 with five surveys in total (1989, 1993, 1996, 1999 and 2003) for elderly respondents and three surveys (1996, 1999 and 2003) for middle-aged respondents. To construct the analytic sample, the sample was trimmed to only middle-aged respondents from 1996 to 2003 with full demographic information. The remaining observation from the trimming is 6512.

Variables' definitions

To construct the dependent variable, this study leveraged the survey question. "Regarding your current health, do you feel it is excellent, good, normal, not good, or poor?" to generate the dependent variable, the self-reported good health was defined as a binary variable equaled to one if a respondent reported having "Excellent" or "Good" for his/her health and zero if a respondent reported having "Normal," "Not Good," or "Poor." The dichotomization of the categorical health status into a binary variable was used in the previous study [6]. Moreover, the dichotomization of the categorical variable does not lead a significant loss of information [30].

The main independent variable was unemployment rates at the county levels. To generate this variable, the county levels' unemployment rates were extracted from Taiwan's Ministry of Labor. The respondents who lived in counties without any data of unemployment rates were excluded from the analysis. Finally, the county levels' unemployment rates from 1996, 1999 and 2003 were matched to the 19 counties of residence in the dataset.

For the demographic variables, a continuous variable was generated for age based on respondents' age. For marital status, a binary variable was also generated. It is equaled to one if a respondent was divorced, separated, or widowed and zero otherwise. For survey year, two binary variables were produced. Each survey year variable is equaled to one if a respondent was surveyed in the respective survey year and zero otherwise.

Statistical analysis

To begin the analyses, the descriptive statistics were calculated for the entire sample, including means, standard deviations, minimums and maximums. Given the longitude nature of the data and binary nature of the dependent variable, this paper analyzed the association using a conditional logistics model. The conditional logistics model would eliminate the time-invariant omitted variables from the model, such as gender and education levels. All the time-varying demographic variables were also included into the model, such as age, marital status and survey year. For the ease of the interpretation, the odd ratios computed for the conditional logistics model. The standard error were clustered at the individual levels. The odd ratios, 95% confidence interval, and p-values are computed from the regressions. The analysis was also stratified by gender and education levels. All regression analyses were performed on STATA 16 MP for windows. The statistical significance was set at the 10% level for all regressions.

Results

Descriptive statistics

Table 1 reports the means, standard deviations, minimums and maximums of the dependent and independent variables in the sample used in this study. Overall, the proportion of middle-aged respondents reported having excellent and very good health is approximately 41.0%. The unemployment rates for the 19 available counties in the sample is 3.483%. The average age of the sample is 61.500. The prevalence of single, divorced and widowed is 81.1%. The total number of respondents is 6512.

Table 1: Descriptive statistics.

	Mean	Standard deviation	Minimum	Maximum
Self-reported good health	0.41	0.492	0	1
Unemployment rates (%)	3.483	1.146	2	5
Age in years	61.5	5.461	50	75
Single/Divorced/ Widowed	0.811	0.391	0	1
Year 1999	0.327	0.469	0	1
Year 2003	0.312	0.463	0	1
N	6512			

Table 2 reports the association between unemployment rates and self-reported good health using a conditional logistics model. Overall, the estimate shows that a higher unemployment rate is significantly associated with a better self-reported physical health among the Taiwanese middle-aged population (OR=1.286; 95% CI=1.024-1.615; P-value=0.030).

Table 2: Association between macroeconomic conditions and self-reported good health among the middle-aged Taiwanese.

Dependent variable	Self-reported good health		
	Odd ratio	95% CI	P-values
Unemployment rates (%)	1.286	(1.024,1.615)	0.03
Age in years	0.925	(0.724,1.182)	0.534
Single/Divorced/Widowed	1.188	(0.798,1.767)	0.396
Year 1999	1.152	(0.541,2.452)	0.713
Year 2003	0.665	(0.128,3.467)	0.628
N	3177		

Note: CI is the abbreviation for the confidence intervals. The conditional logistics model was used and the standard errors clustered at the individual levels. The table presents the estimates using conditional logistics and1996-2003 Taiwan Longitudinal Study in Aging. The model controls for socioeconomic variables shown above. The standard errors are clustered at the individual levels.

Table 3 reports the association between unemployment rates and self-reported good health for men and women. The estimates demonstrated that an increase in unemployment rates is associated with an increase in self-reported good health for men (OR=1.391; 95% CI=1.029-1.881; P-value=0.032). By contrast, no association was observed for women (OR=1.181; 95% CI=0.832–1.677; P-value=0.353). In sum, the association between macroeconomic conditions and health is driven by the middle-aged men in Taiwan.

Table 3: Association between macroeconomic conditions and self-reported good health among the middle-aged Taiwanese by gender.

Dependent variable	Self-reported good health					
	Men			Women		
	Odd ratio	95% CI	P-values	Odd ratio	95% CI	P-values
Unemployment rates (%)	1.391	(1.029,1.881)	0.032	1.181	(0.832,1.677)	0.353
Age in years	1.133	(0.857,1.498)	0.381	0.622	(0.399,0.970)	0.036
Single/Divorced/ Widowed	1.222	(0.625,2.393)	0.558	1.133	(0.684,1.877)	0.627
Year 1999	0.647	(0.269,1.553)	0.329	3.677	(0.944,14.329)	0.061
Year 2003	0.156	(0.023,1.077)	0.059	9.684	(0.511,183.602)	0.13
N	1678			1498		

Note: CI is the abbreviation for the confidence intervals. Left panel reports the results for men and right panel the results for men. The table presents the estimates for men and women using conditional logistics and1996–2003 Taiwan Longitudinal Study in Aging (TLSA). The model controls for socioeconomic variables shown above. The standard errors are clustered at the individual levels.

Table 4 presents the association between unemployment rates and self-reported good health stratified by education levels. The estimates suggest that those without education are more affected by unemployment rates compared to those with education. That is, the estimates demonstrated that the unemployment rates are significantly associated with the odd of reporting good self-reported health for uneducated middle-aged Taiwanese (OR=1.536; 95% CI=0.936–2.523; P-value=0.090). In contrast, the association is not significantly associated with a better health among the educated middle-aged Taiwanese

(OR=1.185; 95% CI=0.917-1.532; P-value=0.194). Overall, the association between macroeconomic conditions and health is more important to the uneducated than educated population in Taiwan.

Table 4: Association between macroeconomic conditions and self-reported good health among the middle-aged Taiwanese by education levels.

Dependent variable	Self-reported good health					
	No education			Has education		
	Odd ratio	95% CI	P-values	Odd ratio	95% CI	P-values
Unemployment rates (%)	1.536	(0.936,2.523)	0.09	1.2	(0.917,1.532)	0.194
Age in years	0.854	(0.456,1.600)	0.621	0.9	(0.732,1.223)	0.674
Single/Divorced/ Widowed	1.385	(0.687,2.793)	0.362	1.2	(0.726,1.921)	0.503
Year 1999	1.516	(0.224,10.279)	0.67	1.1	(0.485,2.378)	0.861
Year 2003	1.051	(0.017,64.333)	0.981	0.6	(0.108,3.564)	0.594
N	751			2426		

Note: CI is the abbreviation for the confidence intervals. Left panel reports the results for uneducated and right panel the results for educated. The table presents the estimates by educations using conditional logistics and 1996–2003 Taiwan Longitudinal Study in Aging (TLSA). The model controls for socioeconomic variables shown above. The standard errors are clustered at the individual levels.

Discussion

This study investigated the association between unemployment rates and self-reported good health in Taiwanese middle-aged population. Using a longitude survey of middle-aged Taiwanese, the estimate suggested that the county levels' unemployment rates significantly increased the probability of reporting a good health. Moreover, men are more likely to report having a good health as the unemployment rates increased compared to women in Taiwan. Finally, the association is stronger among uneducated than educated. This study shows that importance of macroeconomic conditions in influencing a person's physical health.

Our findings are consistent with other studies in the United States and OECD countries [5-22]. Studies, such as Ruhm, et al. and Gonzalez and Quast, showed that recession tend to improve health of population [6]. However, the existing studies focused on non-Asian countries and non-middle-aged population. This study further contribute to the literature by showing that the macroeconomic conditions are significantly associated with a better physical health in Taiwan and among middle-aged population [15].

The mechanisms behind the association is also intriguing. Studies had found that recession allows people to allocate time to exercise [3,10]. Moreover, people are less likely to drink during a recession [4,31]. While there are concerns regarding the decline in income leading to a higher consumption of unhealthy and stress, it appears that the healthier behaviors may have dominated the mechanisms, leading to an overall improvement in health.

The association between macroeconomic conditions and health has important policy implications. As the findings showed, health improves during a recession. This implies that a boom will lead to health deterioration. In other words, policymakers should increase the public health spending during a boom in the economy in order to prevent a public health crisis in a good time. Moreover, the policies should also target one subpopulation over another. That is, the findings showed that men and less-educated are more affected suggesting that policies should be targeted toward men and less-educated.

Limitations

This study has several limitations. First, this study focused only on the middle-aged population in Taiwan. The findings cannot be generalized to other age ranges in Taiwan. For example, those in the age range between 55 and 60 were more likely to be less affected by macroeconomic conditions compared to those in their prime working age, given they are near pensionable age. The income shock from recession or down turn would be less severe. Second, while the self-reported health variable had been widely used, its ability to measure a specific health condition is limited. Future studies should gain accessed to better data on a specific health condition and investigates this topic. Third, self-reported data suffers from the recall bias. An access to biomarkers may alleviate this issue. Future research can further pursue this topic.

Conclusion

This study provides the evidence that the worsening macroeconomic conditions are associated with a better physical self-reported for middle-aged population in Taiwan. The findings from this study showed the importance of providing better public health policies and care during an economic boom is essential in maintaining a good health among the populous.

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