



Business Cycle, Income, and Mortality

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1. ABSTRACT

The association between mortality and business cycle is inconclusive. Most macro level studies find mortality to be pro-cyclical whereas micro level studies suggest the opposite.

The consensus among these studies, however, is on the use of unemployment rate as a proxy for cyclical variations in economic activity. This study builds upon these findings by implementing an alternative proxy - per capita income - to better understand such a mediating relationship.

Using state level annual data of the United States during 1968-2016, this study finds a **negative association between state per capita income and mortality rate**. Contrary to the findings of macro level studies, this analysis suggests that mortality declines during expansions.

2. INTRODUCTION

Conventional wisdom suggests that the health status of individuals would improve during economic booms and decline during recessions.

However, using mortality as an extreme form of health outcomes many empirical studies (Ruhm, 2000) have found that mortality actually declines during recessions, creating a puzzle.

Using unemployment rate as a proxy for business cycles, such studies are conducted both at within country and cross country levels - confirming a pro-cyclical pattern of mortality. However, micro level studies find that people's health deteriorates as they lose jobs.

The main concern here is to check the robustness of such studies using other proxies for business cycles. Therefore, **this study introduces per capita income instead of unemployment rate** to better understand such a mediating relationship.

3. METHODOLOGY

Following the literature, the **fixed effects model** is used here.

- Mortality - proxy for health outcomes (H_{it})
- Per capita income - proxy for cyclical fluctuations (I_{it})
- Controls - state racial and population demographics (X_{it})
- Both the dependent and the main independent variables are in natural log form.

$$M_{it} = \alpha_i + \theta_t + \beta I_{it} + \gamma X_{it} + Trend + \epsilon_{it} \quad (1)$$

- Model (1) is estimated for total population first and then for racial and gender groups separately.

- To compare the results of our model with the past literature, an alternative approach is to incorporate unemployment rate to the model.

$$M_{it} = \alpha_i + \theta_t + \beta I_{it} + \delta UR_{it} + \gamma X_{it} + Trend + \epsilon_{it} \quad (2)$$

- Data is obtained from CDC, BEA, and BLS.

4. RESULTS

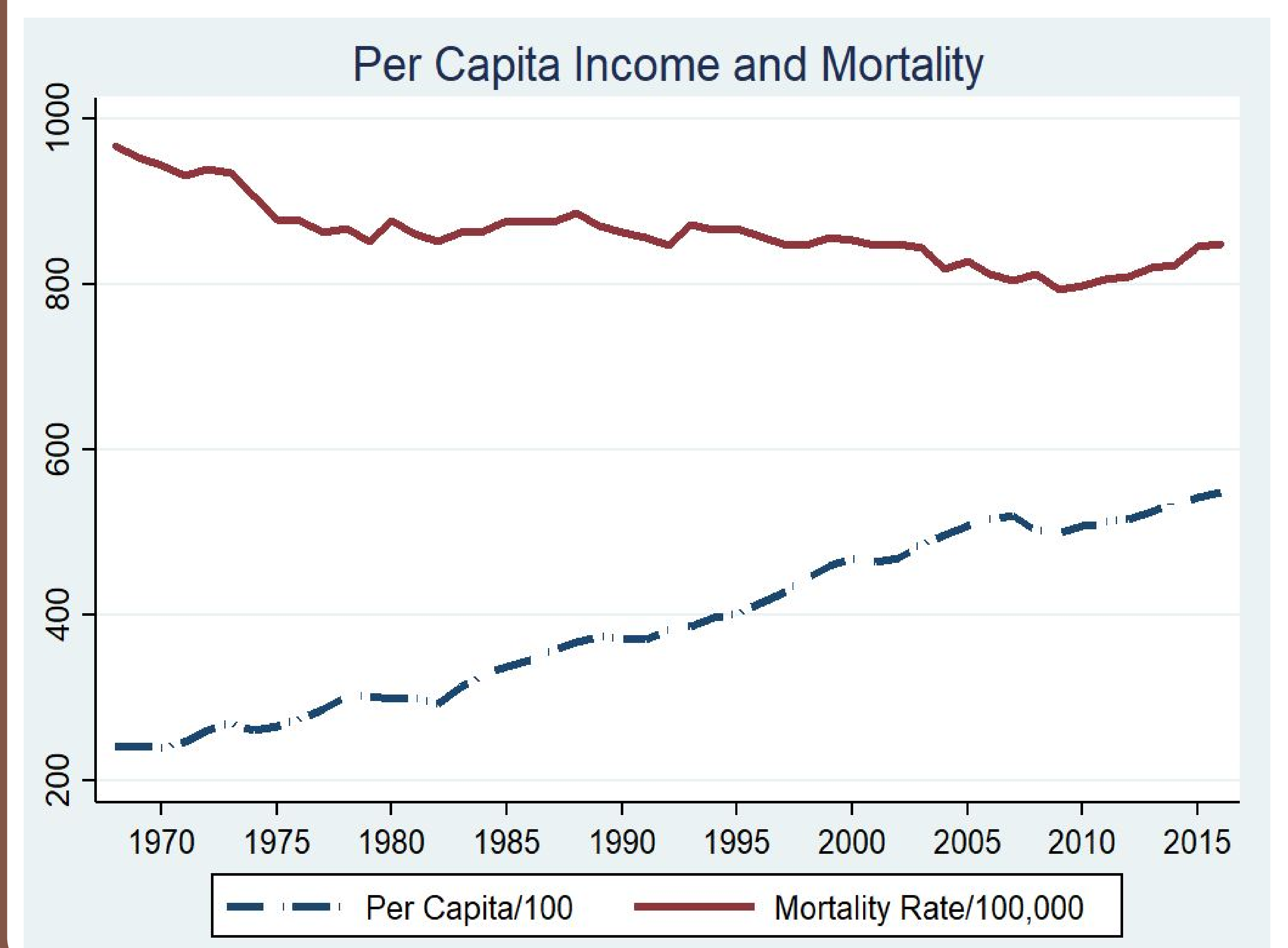
Table 1: Mortality-Income Relations at State Level

	1968-2016
Ln(state per capita income)	-0.304*** (0.104)
# Observations	2,489
R^2 within	0.37

Notes: Dependent variable is the natural log of total mortality rate. In addition to state and year fixed effects, the regression controls for log of population, state percentages of Whites and African Americans, and time trends. Clustered standard errors at the state level are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Summary: The results indicate negative association between state per capita income and mortality. They are consistent when considering subsamples of males, females, Whites, African Americans, and age group of 45-64 year-olds.

5. GRAPH



6. CONCLUSION

Recessionary periods are destructive not only to the financial well-being of the individuals but also to their health.

- Utilized nearly 5 decades of U.S. state level data.
- Used per capita income as a proxy for cyclical fluctuations.
- Found negative association between income and mortality rate.
- It implies that mortality declines as income increases.
- Mortality is counter-cyclical, as opposed to the findings of other macro studies.

7. CONTACT

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