International Cause-Specific Mortality Rates: New Insights from a Cointegration Analysis

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Abstract

Non-stationary time series have been widely studied by economists over the past decades. One interesting feature of non-stationary variables is that we can distinguish between long-run relations, that are stationary, and short-run adjustments towards these. These long-run relations are known as cointegrating relations and represent long-run equilibriums. Since mortality rates are non-stationary variables, the theory developed for economic variables can also be used to gain insights into the long-run relations that may exist between mortality rates for different causes of death. In this work, cointegration is developed for cause-of-death mortality. We analyze the five main causes of death across five major countries, including USA, Japan, France, England & Wales and Australia. Our analysis identifies long-run equilibrium relationships between the five main causes of death, providing new insights into the dependence that exists between competing risks. The study reveals similarities between countries and genders that are in line and further validate past studies done by biologists and demographers. The biological theory on aging is indeed reflected in the cointegrating relations in each and every country studied.

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