The importance of increasing income vs increasing income inequality for improvements in survival - Findings from the natural experiment of German reunification

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Abstract

The inverse relationship between income inequality and mortality is found within and between populations. These studies suggest that life expectancy is lower where income inequality is most severe. Consequently, life expectancy levels would rise as income disparities narrow. In our study, we use the German reunification as a natural experiment to test this relationship. Before reunification, the socialist East Germany was egalitarian in terms of income distribution and lower life expectancy. After reunification mean income rose for all ages but also income inequality widened. At the same time life expectancy increased very quickly mainly for the elderly. We use Gini and Theil indexes for the years 1988-2008 to measure income inequality and decompose them into contributions from age and sex. Our study seeks further to disentangle the contribution of rising income and increasing inequality on the changes in life expectancy.

1 Background

Ever since the work of Kitagawa and Hauser (1973), the negative relationship between income inequality and poor health or mortality is well established. This association is found within countries or between countries and among age group (Van Doorslaer et al., 1997; Mackenbach et al., 1997; Lynch et al., 2001). Additionally, it was found that income related mortality disparities have widened since the 1960s which lead to the assumption that life expectancy on a population level is stagnating in countries where income disparities are large and growing. It is thus assumed that if income would be distributed more evenly mortality disparities would decline and, consequently, life expectancy levels rise (Lynch et al., 2000; Marmot, 2013).

At the same time, studies suggest that is rather individual income than an equal distribution of income among a society that helps to improve health and survival (Fiscella and Franks, 2000; Shibuya et al., 2002). The level of life expectancy is higher in countries with higher wealth and income (Preston, 1975). This famous relationship holds equally true for comparisons over time as well as at the subnational level and the individual level (Deaton, 2004; Bloom and Canning, 2007). Yet, this relationship holds true only up to an certain level of income. Over this threshold the positive effect of increasing wealth on life expectancy levels off. An already wealthy person may not benefit to the same extent from an income increase like a poorer person.

Our study seeks to add to this discussion by exploring both relationships in the natural experiment setting of the German reunification. The experiment consists of one population sharing the same cultural and historic background and being separated for four decades. During the separation East and West Germans faced very different political, social and economic conditions. With the Fall of the Berlin Wall 25 years ago, the separation was apruptly ended and East Germans had to adopt the West German system. Life expectancy levels responded very plastical to these changes (see Figure 1).

While during the 1970s and 1980s East German life expectancy was increasingly lacking behind the Western level, it caught up very quickly in the years following reunification. In this context, more important than the political reunification was the social, economic and currency union in July 1990. East Germans became eligible to the West German social security system and experienced a manifold nominal income and purchasing power increase. At the same time, the former socialist East Germany was egalitarian in terms of income distribution. Thus, after reunification, East Germans faced a marked increase in income inequality among all age groups. By using this framework, we aim at testing the relative effect of both changes on the mortality risks of East Germans.

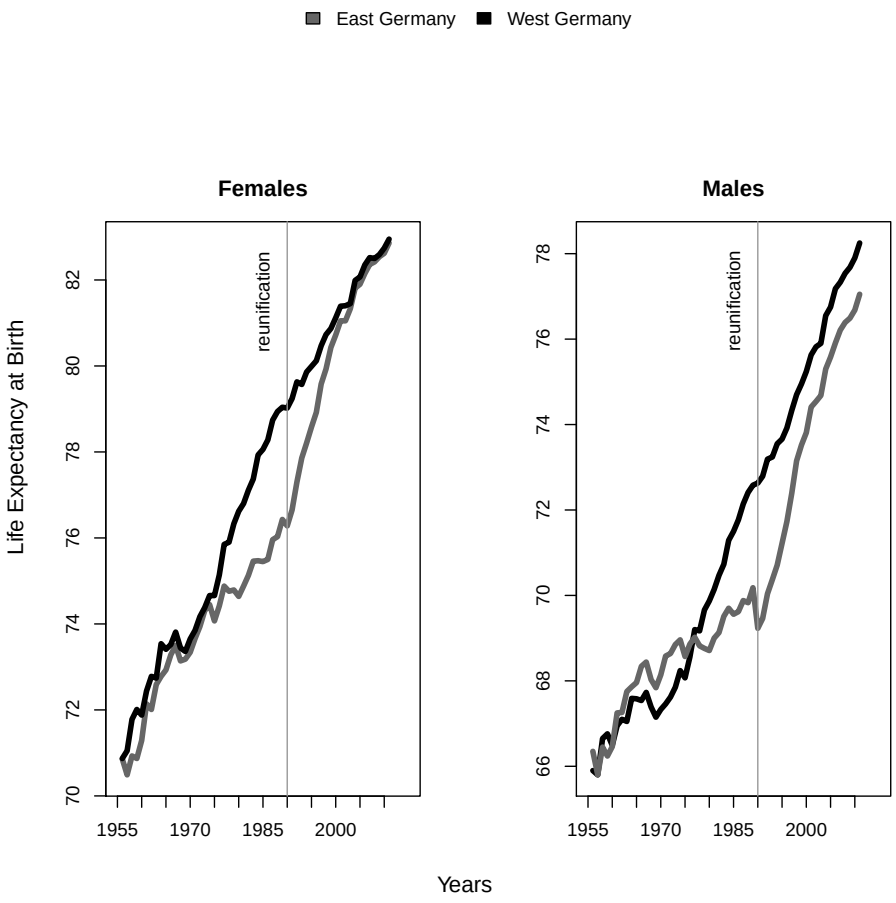

Figure 1: Female and male life expectancy in East and West Germany 1956-2010

2 Data and Methods

Unfortunately, individual level data from the former East Germany are scarce and a comprehensive dataset containing individiual level information on the relationship between socioeconomic status and health or death does not exist. To estimate income levels and income inequality by age and sex, we use income and expenditure surveys for the years 1993 to 2008. They are caried out every five years from the German Federal Statistical Office and contain information on all monthly individual income sources. We added a so far unused and unique income survey from the former socialist East Germany from 1988 to estimate average incomes and income disparities by age and sex 2 years before reunification. In our envisaged analysis, we seek to explore the association between income, income inequality and mortality by combining the survey data with

cause of death data from the German Federal Statistical Office for the corresponding years. We aim at estimating various measures for income inequality like Gini coefficients and Theil indices and decompose them into contributions from different age groups and sexes. We expect that some age groups, especially pensioners, benefited more from the new income distributin while others suffered from increased inequality.

3 Preliminary Results

In a first step, our analysis showed that the yearly median income levels for all age groups above age 20 at least doubled between 1988 and 1993 (see Figure 2). East Germans in their prime labor market ages as well as pensioners witnessed an up to five-fold increase in their income in the three years after reunification. Until 2008, income levels rose further but at far lower rate. Figure 2 also shows that income variation within and betwwen age groups rose. In 1988, income was still rather evenly distributed up to retirement age but the distribution changed in the years follwing reunification. From 1993 onwards, there is more inter and between age group variance in the distribution of income.

This general trend becomes also apparant when we compare measures of inequality such as Lorentz -curves, their related Gini coefficients and Theil indices (see Figure 3).[1] Income was most unevenly distributed in 1993 which seems plausible given the collapse of the East German economy after reunification and the consequent mass lay-offs. After 1993, income is more evenly distributed but inequality is considerably higher as during the socialist period before reunification.

[1]Theil indices are conceptionally not related to the Lorentz curve and are only included here for comparison with Gini coefficients

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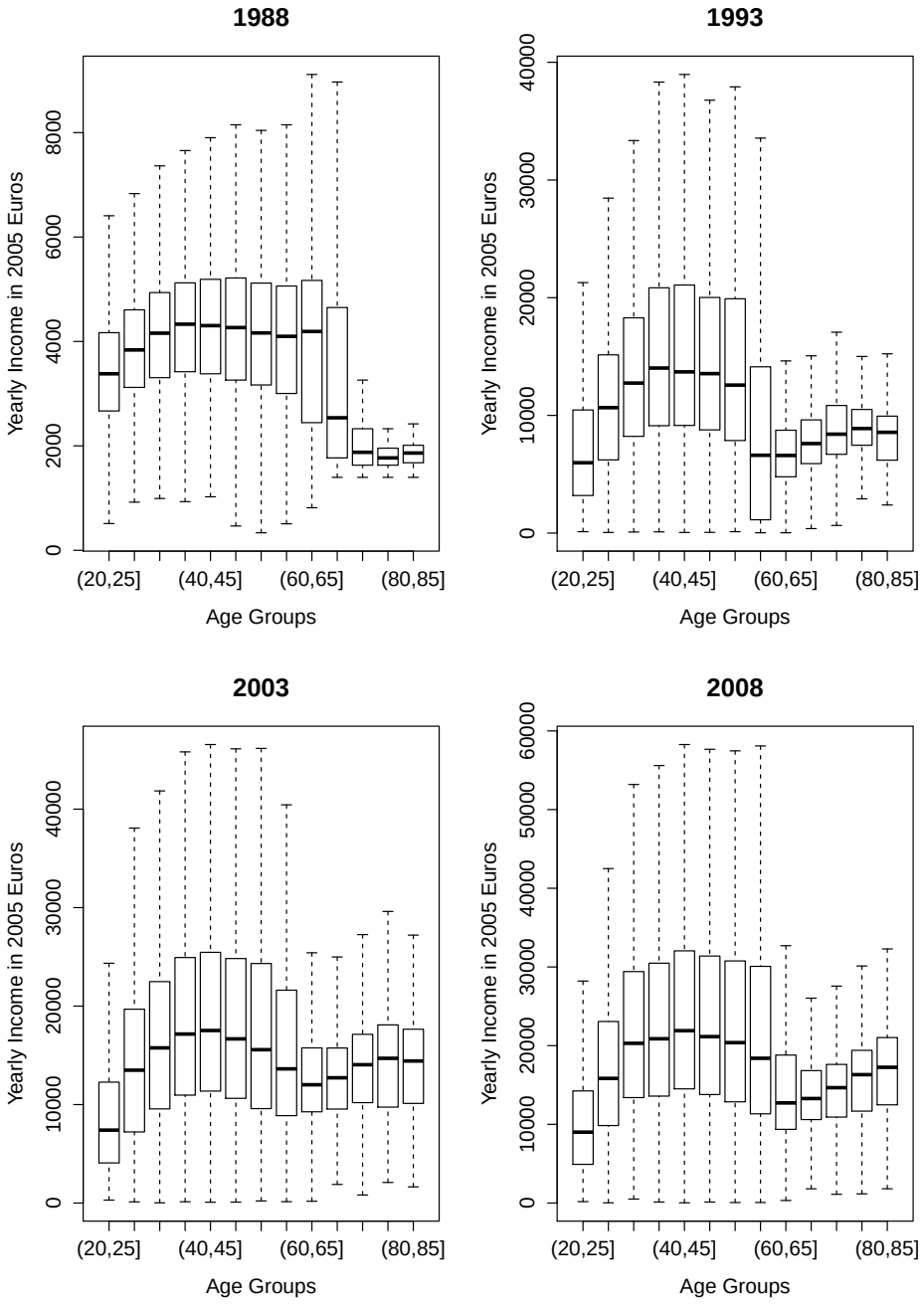

Figure 2: Boxplots for yearly income distributions among age groups East Germany 1988-2008

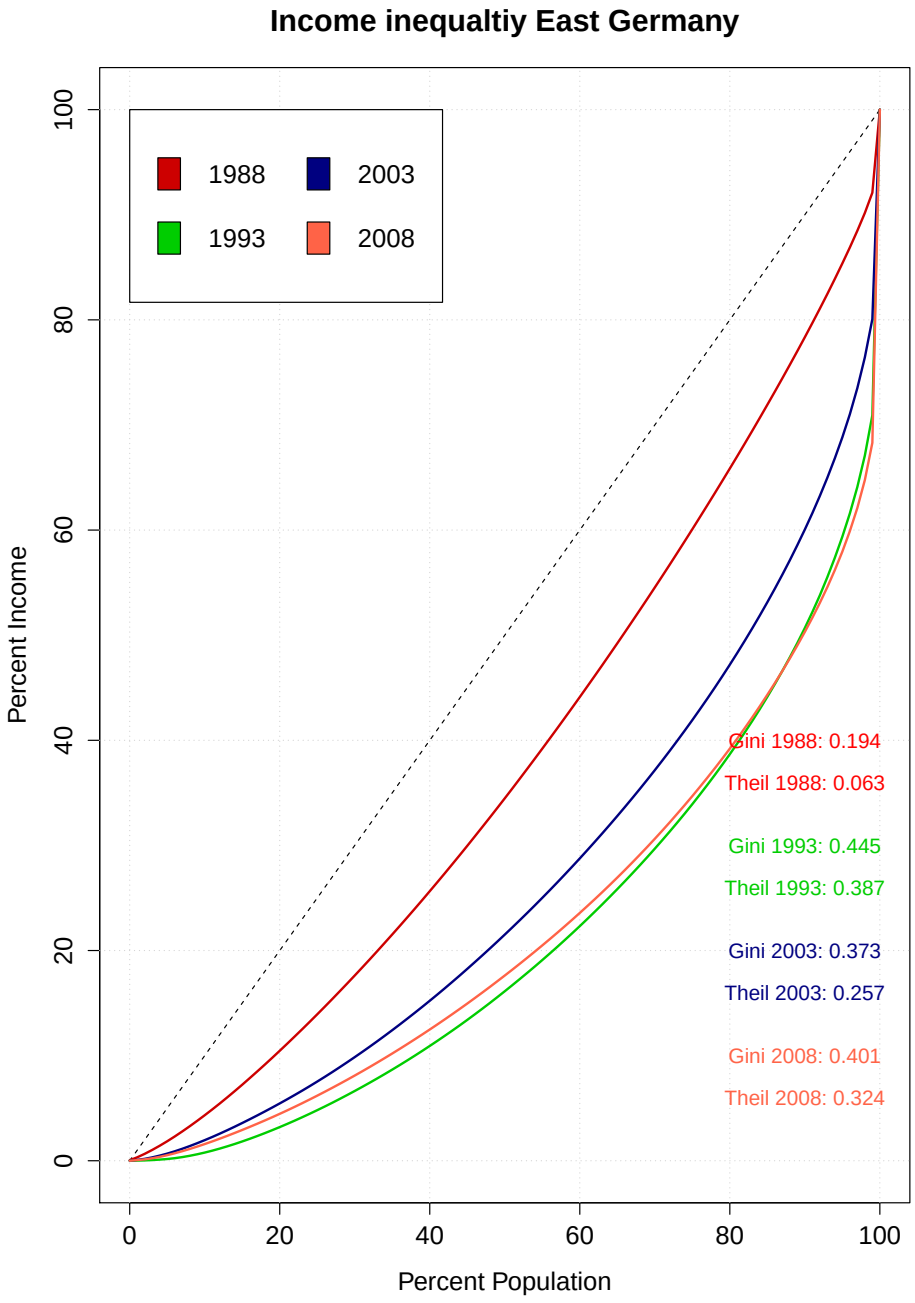

Figure 3: Lorentz curves and Gini-coefficients and Theil-indices 1988-2008