

Libor Dušek, CERGE-EI

GDN RRC X-67

“How Much Intergenerational Risk Sharing do Pay-As-You-Go Pension Systems Really Provide?”

Non-technical summary

The ability to share risk across generations is a desirable feature of pay-as-you-go pension systems. Say there is a major stock market crash. A generation that was just nearing retirement lost a sizable fraction of its savings that were supposed to support it during the old age. In principle, that generation can be “compensated” by higher pension benefits. The current young or the future generations would then have to pay higher taxes – effectively they would share the losses of the stock market crash with the effected cohort. Large theoretical literature has demonstrated formally that the pay-as-you-go pension system can transfer incomes across generations in a way that shares the risk and improves welfare.

But do the pay-as-you-go pension systems actually work that way? The pension legislation defines parameters such as contributions, benefit formula and retirement age that translate the wage histories of individuals and the entire economy into benefits. The benefits are usually to some extent linked to wage growth, hence the young share the higher living standards with the old. One can compute how the rules will redistribute incomes across generations, and several researchers have already evaluated the risk sharing characteristics of alternative rules.

However, the rules change from time to time. Governments adopt pension reforms that adjust all the parameters, sometimes in a dramatic way. Each generation lives through a series of reforms that continuously adjust the contributions it pays and the benefits it is promised to receive. The resulting “compensation” from the pension system could be very different from what the generation may have expected at any point in time, if it assumed that the rules would stay in place forever.

The paper documented the patterns of risk sharing that the U.S. Social Security system, “as implemented” since the 1930, has actually provided. The basic idea is simple – one can measure how good a “deal” any generation received from Social Security by the so called lifetime net transfer – the present value of the benefits received minus the present value of the contributions paid over the lifetime. If Social Security shares risk across generations, the cohorts that experienced relatively worse wage or stock market histories should receive relatively higher net transfers.

I investigate whether there is indeed such a relationship between lifetime net transfers, wages, and returns on savings for the cohorts born between 1900 till 1985. To do so I compute the present value of Social Security benefits, contributions, wages, and savings that a representative agent expected to receive in each year under the Social Security legislation valid in that year, using adaptive expectations to make forecasts about the future. (To be able to do so, I greatly appreciate the generosity of Sita Slavov and John Shoven who shared the data from their earlier paper.)

An interesting finding is that the net transfers from Social Security do reflect differences in the stock-market histories between cohorts. It is particularly striking given the fact that the Social Security rules do not contain explicit provisions linking stock market returns, contributions, and benefits. But Social Security appears to work “as if” it were designed to compensate the cohorts

with lower lifetime returns on savings with higher lifetime net transfers. Changes in the generosity of the Social Security, as implemented through numerous reforms, appear to have taken to stock market histories into account in a manner that is broadly consistent with optimal risk sharing. On the other hand, net transfers do not reflect differences between cohorts in their lifetime wages, which is also surprising the fact that the Social Security index several variables to wage growth.

The second finding is aggregate shocks (measured as changes in expected lifetime wages or savings across all non-retired cohorts) over 5-year intervals translate into changes in expected net transfers in a manner that is (at least quantitatively) broadly consistent with optimal intergenerational risk sharing: Increases in expected wages increase the transfer to the old while increases in expected savings increase the transfer to the young.

Last, several patterns in the data are clearly inconsistent with intergenerational risk sharing: Many cohorts received a “deal” from Social Security that is too good or too bad to be explained by differences in economic outcomes across cohorts. Simply stated, some cohorts got more “lucky” than others. Especially the cohorts born in the 1930’s were far richer than the cohorts born at the beginning of the 20th century yet they also received the largest net transfer.