13.1

APPLICATION: Why Choose 35 Years?

- Using the 35 highest years reflects multiple concerns.
  - No penalty for low-earning years early in career.
  - Not too large a benefit for high earning years late in career.
- Too short a window leads to abuse:
  - Bus driver working 25-hour shifts to maximize pension payment.
  - Brazilian public employees receiving promotions right before retirement.
13.1 How Are Social Security Benefits Calculated?

- Beneficiaries receive annuity payments.
  - **Annuity payment**: A payment that lasts until the recipient’s death.

- Payment size depends on the recipient’s average earnings over the 35 highest earning years, called the *Average Indexed Monthly Earnings, or AIME*.

- Benefits are a redistributive function of past earnings, as the replacement rate falls with AIME.
  - **Replacement rate**: The ratio of benefits received to earnings prior to the entitling event.
Social Security Benefits as a Function of Earnings

The graph illustrates the relationship between Primary Insurance Amount (PIA) and Average Indexed Monthly Earnings (AIME). The graph shows:

- A PIA of $690.2 when AIME is $767, corresponding to a benefit rate of 90 cents per dollar.
- A PIA of $1,924.5 when AIME is $4,624, corresponding to a benefit rate of 32 cents per dollar.
- A PIA of $2,178 when AIME is $6,316, corresponding to a benefit rate of 15 cents per dollar.

The graph indicates that the benefit rate decreases as earnings increase.
What Is Social Security and How Does It Work?

How Does Social Security Work Over Time?

How Social Security Redistributes Income

### Table 13-1

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of Young Workers</th>
<th>Earnings Per Young Worker</th>
<th>Taxes Paid Per Young Worker</th>
<th>Total Taxes Paid</th>
<th>Number of Old Retirees</th>
<th>Benefits to Old Retirees</th>
<th>Taxes Paid by Old Retirees</th>
<th>Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>$20,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>105</td>
<td>$21,000</td>
<td>$2,100</td>
<td>$220,500</td>
<td>100</td>
<td>$2,205</td>
<td>0</td>
<td>Infinite</td>
</tr>
<tr>
<td>3</td>
<td>110</td>
<td>$22,050</td>
<td>$2,205</td>
<td>$242,550</td>
<td>105</td>
<td>$2,310</td>
<td>$2,100</td>
<td>10%</td>
</tr>
<tr>
<td>4</td>
<td>115</td>
<td>$23,153</td>
<td>$2,315</td>
<td>$266,225</td>
<td>110</td>
<td>$2,420</td>
<td>$2,205</td>
<td>10%</td>
</tr>
<tr>
<td>5</td>
<td>121</td>
<td>$24,310</td>
<td>0</td>
<td>0</td>
<td>115</td>
<td>0</td>
<td>$2,315</td>
<td>Negatively infinite</td>
</tr>
</tbody>
</table>
How Does Social Security Redistribute in Practice?
SSW for a Single Male

<table>
<thead>
<tr>
<th>Earnings</th>
<th>Turns 65 in 1960</th>
<th>Turns 65 in 1995</th>
<th>Turns 65 in 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low earner</td>
<td>$26,100</td>
<td>$12,500</td>
<td>$-4,100</td>
</tr>
<tr>
<td>Average earner</td>
<td>35,500</td>
<td>$-5,100</td>
<td>$-56,200</td>
</tr>
<tr>
<td>High earner</td>
<td>35,800</td>
<td>$-41,100</td>
<td>$-248,500</td>
</tr>
</tbody>
</table>

- Redistribution from younger to older cohorts due to:
  - First cohort didn’t pay in until 1937.
  - Payroll tax has increased over time.
How Does Social Security Redistribute in Practice?

Some examples of how SSW varies within groups that are the same ages include the following:

- Females have more SSW than males because they live longer.
- Married couples have more SSW than single people.
- Single-earner couples have more SSW than two-earner couples.
- The gains to the poor relative to the rich from Social Security are overstated because the length of life rises with income.
13.2 Living Standards of the Elderly, 1959–2009

![Graph showing the Poverty Rate for 65+ (%) and Social Security Spending (as % of GDP) from 1959 to 2007. The graph illustrates the trend of poverty rates declining with increased social security spending.](image-url)
Figure 4. Change in consumption at retirement, by wealth quartile
Fig 1.—Percentage change in food expenditure, predicted food consumption index, and time spent on food production for male household heads by three-year age ranges. Data are taken from the pooled 1989–91 and 1994–96 cross sections of the CSFII, excluding the oversample of low-income households. The sample is restricted to male household heads (1,510 households). All series were normalized by the average levels for household heads aged 57–59. All subsequent years are the percentage deviations from the age 57–59 levels. See Sec. IV for details of data and derivation of food consumption index.

Source: Aguiar and Hurst (2005), p. 925
13.3

Spike in Retirement Hazard at EEA

- **Retirement hazard rate**: The percentage of workers retiring at a certain age.
13.3 Spike in Retirement Hazard at EEA

![Graph showing retirement hazard rates in 1960, 1970, and 1980. The graph indicates a spike in retirement hazard at age 65, particularly noticeable in 1980.]
13.3

Retirement Hazard Rate in France

![Graph showing retirement hazard rate in France with key at 60 years of age for Social Security EEA & FBA.](image-url)
• Retirement age lowered from 65 to 60 in 1973.
APPLICATION: Implicit Social Security Taxes and Retirement Behavior

• Gruber and Wise (1999) calculated the implicit tax from Social Security for a series of countries.

• Across countries, there is a great deal of variation in the implicit tax rate.
  - Implicit tax close to zero for 62-year-olds in the United States.
  - 91% in the Netherlands.

• And countries with higher taxes have less elderly labor force participation.
Implicit Social Security Taxes and Retirement Behavior

![Graph showing the relationship between disincentive to work and nonworking elderly across different countries. The graph includes points for Japan, United States, Canada, Spain, Sweden, United Kingdom, France, Germany, Netherlands, Italy, and Belgium. The R² value is 0.82.](image)
Social Security Reform

Number of Elderly per 100 Working Age People

Year


10 15 20 25 30 35 40
APPLICATION: The Social Security Trust Fund and National Savings

• In theory, one benefit of the partial funding of Social Security through the build-up of the trust fund is an increase in national savings.

• The trust fund is “off budget,” not supposed to be part of budget discussion.

• But typically the government reports the deficit/surplus from the “unified budget,” which incorporates off-budget categories.

• Makes it easy to treat trust fund as an asset, avoid fixing the deficit.
Automatic enrollment effect

Automatic enrollment dramatically increases participation.

401(k) participation by tenure at firm: Company B

Fraction of employees ever participated

Source: Madrian and Shea (2001)
Automatic enrollment effect

Employees enrolled under automatic enrollment cluster at the default contribution rate.

Distribution of contribution rates: Company B

Source: Madrian and Shea (2001)
The Flypaper Effect in Individual Investor Asset Allocation (Choi, Laibson, Madrian 2007)

Studied a firm that used several different match systems in their 401(k) plan.
I’ll discuss two of those regimes today:

**Match** allocated to employer stock and workers can reallocate
- Call this “default” case (default is employer stock)

**Match** allocated to an asset actively chosen by workers;
workers *required* to make an active designation.
- Call this “no default” case (workers must choose)

Economically, these two systems are identical.
They both allow workers to do whatever the worker wants.

Source: courtesy of David Laibson
## Consequences of the two regimes

<table>
<thead>
<tr>
<th></th>
<th>Default</th>
<th>No Default</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Own Balance in Employer Stock</strong></td>
<td>24%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Matching Balance in Employer Stock</strong></td>
<td>94%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>Total Balance in Employer Stock</strong></td>
<td>56%</td>
<td>22%</td>
</tr>
</tbody>
</table>

Source: courtesy of David Laibson
APPLICATION: Company Stock in 401(k) Plans

401(k) plans are an important feature of retirement savings in the United States.

• These plans allow individuals to save in self-directed investment choices.

• But there are several problems with them:
  o Some workers have as much as 80% of their assets in company stock.
  o If the company fails, they will lose their job and their savings.
Life Cycle Model

0: work starts
R: retirement
T: death

Earnings
Wealth
Consumption
savings
dissaving
Rational vs. Myopic Individual

Rational individual
\( (c_1 = c_1^*, c_2 = c_2^*) \)

Myopic individual
\( (c_1 = W, c_2 = 0) \)
Adding forced savings $\tau=s^*$

Rational individual stays at $(c_1=c_1^*, c_2=c_2^*)$

Myopic individual moves to $(c_1=c_1^*, c_2=c_2^*)$
Figure 6. Possible effects of disability on prime-age male labour force participation


Source: Black, Furman, Rackstraw, Rao (2016)
Figure 1. Prime-age male labour force participation rate

Source: Black, Furman, Rackstraw, Rao (2016)
There was a pause in midlife mortality decline in the 1960s, largely explicable by historical patterns of smoking (13). Otherwise, the post-1999 episode in midlife mortality in the United States is both historically and geographically unique, at least since 1950. The turnaround is not a simple cohort effect; Americans born between 1945 and 1965 did not have particularly high mortality rates before midlife.

Fig. 2 presents the three causes of death that account for the mortality reversal among white non-Hispanics, namely suicide, drug and alcohol poisonings (accidental and intent undetermined), and chronic liver diseases and cirrhosis. All three increased year-on-year after 1998. Midlife increases in suicides and drug poisonings have been previously noted (14–16). However, that these upward trends were persistent and large enough to drive up all-cause midlife mortality has, to our knowledge, been overlooked. For context, Fig. 2 also presents mortality from lung cancer and diabetes. The obesity epidemic has (rightly) made diabetes a major concern for midlife Americans; yet, in recent history, death from diabetes has not been an increasing threat. Poisonings overtook lung cancer as a cause of death in 2011 in this age group; suicide appears poised to do so.

Table 1 shows changes in mortality rates from 1999 to 2013 for white non-Hispanic men and women ages 45–54 and, for comparison, changes for black non-Hispanics and for Hispanics. The table also presents changes in mortality rates for white non-Hispanics by three broad education groups: those with a high school degree or less (37% of this subpopulation over this period), those with some college, but no bachelor’s (BA) degree (31%), and those with a BA or more (32%). The fraction of 45- to 54-y-olds in the three education groups was stable over this period. Each cell shows the change in the mortality rate from 1999 to 2013, as well as its level (deaths per 100,000) in 2013.

Over the 15-y period, midlife all-cause mortality fell by more than 200 per 100,000 for black non-Hispanics, and by more than 60 per 100,000 for Hispanics. By contrast, white non-Hispanic mortality rose by 34 per 100,000. The ratio of black non-Hispanic to white non-Hispanic mortality rates for ages 45–54 fell from 2.09 in 1999 to 1.40 in 2013. CDC reports have highlighted the narrowing of the black–white gap in life expectancy (12). However, for ages 45–54, the narrowing of the mortality rate ratio in this period was largely driven by increased white mortality; if white non-Hispanic mortality had continued to decline at 1.8% per year, the ratio in 2013 would have been 1.97. The role played by changing white mortality rates in the narrowing of the black–white life expectancy gap (2003–2008) has been previously noted (17). It is far from clear that progress in black longevity should be benchmarked against US whites.

The change in all-cause mortality for white non-Hispanics 45–54 is largely accounted for by an increasing death rate from external causes, mostly increases in drug and alcohol poisonings and in suicide. (Patterns are similar for men and women when analyzed separately.) In contrast to earlier years, drug overdoses were not concentrated among minorities. In 1999, poisoning mortality for ages 45–54 was 10.2 per 100,000 higher for black non-Hispanics than white non-Hispanics; by 2013, poisoning mortality was 8.4 per 100,000 higher for whites. Death from cirrhosis and chronic liver diseases fell for blacks and rose for whites. After 2006, death rates from alcohol- and drug-induced causes for white non-Hispanics exceeded those for black non-Hispanics; in 2013, rates for white non-Hispanic exceeded those for black non-Hispanics by 19 per 100,000.

The three numbered rows of Table 1 show that the turnaround in mortality for white non-Hispanics was driven primarily by increasing death rates for those with a high school degree or less. All-cause mortality for this group increased by 134 per 100,000 between 1999 and 2013. Those with college education less than a BA saw little change in all-cause mortality over this period; those with a BA or more education saw death rates fall by 57 per 100,000. Although all three educational groups saw increases in mortality from suicide and poisonings, and an overall increase in external cause mortality, increases were largest for those with the least education. The mortality rate from poisonings rose more than fourfold for this group, from 13.7 to 58.0, and mortality from chronic liver diseases and cirrhosis rose by 50%. The final two rows of the table show increasing educational gradients from 1999.
Figure 2.2: Employment of those aged 60–64

Source: Blundell, French, and Tetlow (2017)

Source: As Figure 2.1
Figure 2.2: Employment of those aged 60–64

Source: Blundell, French, and Tetlow (2017)
Figure 2.3: Employment of those aged 65–69

Source: Blundell, French, and Tetlow (2017)
Figure 2.3: Employment of those aged 65–69

Source: Blundell, French, and Tetlow (2017)
When the pension age was set at 65 in the UK, in 1925, life expectancy for men at that age was 11.2 years (as Figure 2.7 shows). This figure had changed little over the preceding 80 years. However, over the following 90 years (and particularly after 1960), it was to increase rapidly, reaching 18.9 years by 2012. This, coupled with the sharp fall in employment rates of older men described in section 2.2.1, led to a rapid expansion of the period spent in ‘retirement’.

The same coincidence of rising life expectancy and falling employment rates led to similar expansions in the prevalence and length of retirement across most developed countries after the Second World War. Most people in developed countries now expect to have a period of leisure at the end of their lives, with the date of their exit from employment determined not only by declining productivity and capacity to work but also by other factors such as their access to publicly and privately provided pensions.
Figure 2.6: Employment rate of men aged 65+ in the UK and the US

Source: Data for the UK from Matthews et al. (1982) and the Labour Force Survey. Data for the US from Moen (1987) and OECD.

at 70.

The same eligibility age was adopted by the British, in 1909, when they too introduced an old age pension. For those who were reaching pension age in the UK system’s first year of operation, life expectancy at birth had been just 40 years for men and 43 years for women. Only one-in-four of those born in 1838 in the UK would actually have been alive to receive a pension.

It was only somewhat later that pension eligibility ages were reduced to 65, which subsequently became widely accepted as an appropriate age to retire in many countries. The pension eligibility age was reduced to 65 in 1916 in Germany and in 1925 in the UK, and it was 65 from the inception of Social Security in 1935 in the US.

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2 In contrast, over four-in-five of the men born in 1943 and the women born in 1948 (who reached the eligibility age for public pensions in 2008) were still alive. Source: Department for Work and Pensions (2008).

3 Age 65 had also been used by the Pensions Bureau in the US as the age of pension eligibility for Union army veterans from 1890 onwards (Costa, 1998).