

# Social Security: Actuarial Status and Assumptions

Webinar

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## **PANELISTS:**

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## **DISCUSSANT:**

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# Agenda

## Part 1: *Understanding the Assumptions Used to Evaluate Social Security's Financial Condition*

Eric Klieber, MAAA, FSA, EA; Vice-chairperson, Social Security Committee

## Part 2: *Actuarial Status of Social Security in the 2012 Trustees Report*

Tim Marnell, MAAA, ASA, EA; Member, Social Security Committee



# Part 1

## Understanding the Assumptions Used to Evaluate Social Security's Financial Condition



# Who is Evaluating Social Security's Financial Condition?

- Social Security's Board of Trustees issues an Annual Report
  - Required by law
  - 75-year valuation period
  - Three projections: best estimate, high cost and low cost
- Congressional Budget Office and Office of Management and Budget
  - Provide annual cost estimates to Congress and Executive, respectively
  - Both use Trustees' best estimate demographics projections
  - But use own economic assumptions
- Outside experts from think tanks and academia
  - May choose their own methods and assumptions



# Who is Evaluating Social Security's Financial Condition?, cont.

- All of these projections rely on assumptions about future demographic and economic trends
- Because the future remains uncertain
- The selection of assumptions affects the results of any projection
- The results in turn affect the policy prescriptions of anyone relying on the projection



# Two Categories of Assumptions

- Demographic assumptions: used to project future populations of –
  - Workers paying into the system
  - Retired and disabled worker beneficiaries
  - Family members and survivors receiving benefits
- Economic assumptions: used to project –
  - Earnings and the resulting taxes paid into the program
  - Amount of benefit payments
  - Investment income on trust fund assets



# Sources of Assumptions

- Past experience: the normal valuation process includes
  - Comparing actual experience and past projections
  - Fine tuning assumptions based on this analysis
- Judgment about future changes in experience
  - Will mortality continue improving at historical rates?
  - Will people work to older ages as longevity improves?
  - Will an aging population slow economic growth?
  - How will emerging economies affect the US economy?





# Demographic Assumptions



# Fertility

- Average number of children born to a woman during her lifetime
- Primary determinant of rate new workers enter system
- Adjusted fertility rate
  - Excludes children who do not survive to age 10\*
  - Nearly constant at 3.0 from early 20th century to 1960s
  - Declined to about 2.0 in 1960s and 1970s
  - Nearly constant since then
- Decline in adjusted fertility rate contributes highly to the projected increase in benefit payments as a percentage of GDP

[\*They never participate in Social Security]



# Immigration

- Secondary determinant of rate new workers enter system
  - Most immigrants spend all or most of their working lifetimes in US
  - Emigrants more likely to be older and are often already retired
  - Important to treat immigrants and emigrants separately
- Legal immigration has increased since WWII due to increases in statutory quotas
- Other than legal immigration hard to quantify



# Mortality

- Decreased greatly during 1970s, more slowly since 1982
- Result: longer benefit payout periods, fewer pre-retirement deaths
- The former has a far greater impact on cost projections
- Future rate of mortality improvement highly uncertain



# Mortality, cont.

- Factors favoring rapid decrease in mortality:
  - Medical advances
  - Greater emphasis on disease management
  - Lifestyle changes, e.g., more exercise, less smoking
- Factors favoring leveling off of mortality improvement:
  - Diminishing returns on medical research
  - High cost of medical care
  - Possible emergence of new diseases
  - Obesity



# Disability Incidence

- Determines greatly the cost of disability insurance
- Tends to be cyclical in response to ups and downs in economy
- Long-term age adjusted rates have not changed much recently
- Aging population and recent severe recession combined have caused high rates of new disability awards in the last several years, but not outside historical norms



# Economic Assumptions



# Earnings Increases

- Affects both tax receipts and benefit amounts
- Made possible by increases in productivity, i.e., ratio of real GDP to hours worked
- Earnings increases do not exactly track productivity increases due to –
  - Changes in average hours worked
  - Changes in proportion of total compensation paid as earnings
  - Inflation (as measured by GDP deflator)
  - Other factors with small effects





# Consumer Price Index

- CPI for urban wage earners and clerical workers
  - (CPI-W)
- Beginning with the year of benefit eligibility
  - (age 62 for retirees)
- Intended to maintain purchasing power of benefits



# Real Wage Differential

- Wage increase minus increase in CPI-W
- A higher real wage differential decreases program cost (and vice versa):
  - At any given time, income rises with increases in wages
  - While outgo rises in part with increases in CPI-W
- The future real wage differential is a significant factor bearing on Social Security's financial health



# Real Interest Rate

- “Real” means excess over CPI-W
- Social Security’s assets invested in special issue Treasury securities
- Interest rates approximate rate on medium term public securities
- The real interest rate assumption affects projections in two ways:
  - Affects return on system’s accumulated assets
  - Affects present value of future system cash flows



# Labor Force Participation Rate

- Proportion of working age population employed, self-employed or looking for work
- Includes covered and non-covered workers and those unemployed
- Assumption affects projection in two ways:
  - Affects aggregate earnings and, hence, tax income
  - Affects number of two-earner couples
- Future labor force participation rates, particularly among those eligible for old age benefits, remain a great uncertainty in projecting Social Security's future financial condition



# Unemployment Rate

- Proportion of workers in the labor force unable to find work
- Assumption affects projection in two ways:
  - Affects aggregate earnings and, hence, tax income
  - Affects participant's benefits at retirement
- Former effect much greater
- Spike in unemployment rate due to recent recession caused benefit payments to overtake tax income about five years earlier than predicted
- But did not have a large effect on the system's long-term finances



# Stock Return Assumption

- Not a required assumption for current program
- But required for any reform proposal that calls for investment of trust fund assets in stocks, whether or not in individual accounts
- Advocates for such investments focus on the higher potential expected return of such investments; opponents note that stock returns are not guaranteed and could be significantly more or less than expected.



# Assumptions Over An Infinite Time Horizon

- Since 2003 the Trustees Report has included an infinite time horizon projection
- Given the uncertainty of major assumptions over the regular 75-year projection period, it seems unreasonable to expect that results over an infinite period will be sufficiently reliable to use as a basis for policy decisions
- For example, merely extending current assumptions for mortality improvement and changes in labor force participation rates leads to the conclusion that some day workers will receive benefits for a longer period than they pay into the system



“It’s tough to make predictions,  
especially about the future.”

-Yogi Berra





# Conclusions for Part 1

- Even experts can and do disagree about future demographic and economic trends that will affect Social Security's long-term finances
- There are many sets of assumptions that are reasonable
- Small changes in assumptions can lead to large changes in results over 75 years



# Conclusions for Part 1, cont.

- Do other groups making long-term projections of Social Security's finances:
  - Disclose all assumptions?
  - Use assumptions that are internally consistent?
  - For any assumption subject to substantial uncertainty, provide a sensitivity analysis?
- Be aware of how using different assumptions affects the comparison of reform proposals
- The Trustees Report and the Social Security actuaries have set “the standard” for providing this information to policymakers



# Part 2

## 2012 Trustee Report Actuarial Status



# Results from 2012 Trustees Report

- In general, the Trustees report on:
  - Short-range results
    - Year just ended results (2011)
    - 10-year projection period (2012 to 2021)
  - Long-range results
    - 75-year period (2012 to 2086)



# 2012 Results

- Cost, generally benefit payments plus administrative expenses, continued to exceed non-interest income
- Deficit of non-interest income relative to cost was:
  - \$45 billion for 2011
  - \$53 billion projected for 2012
- General revenue reimbursements for 2011 were \$103 billion and projected to be \$112 for 2012



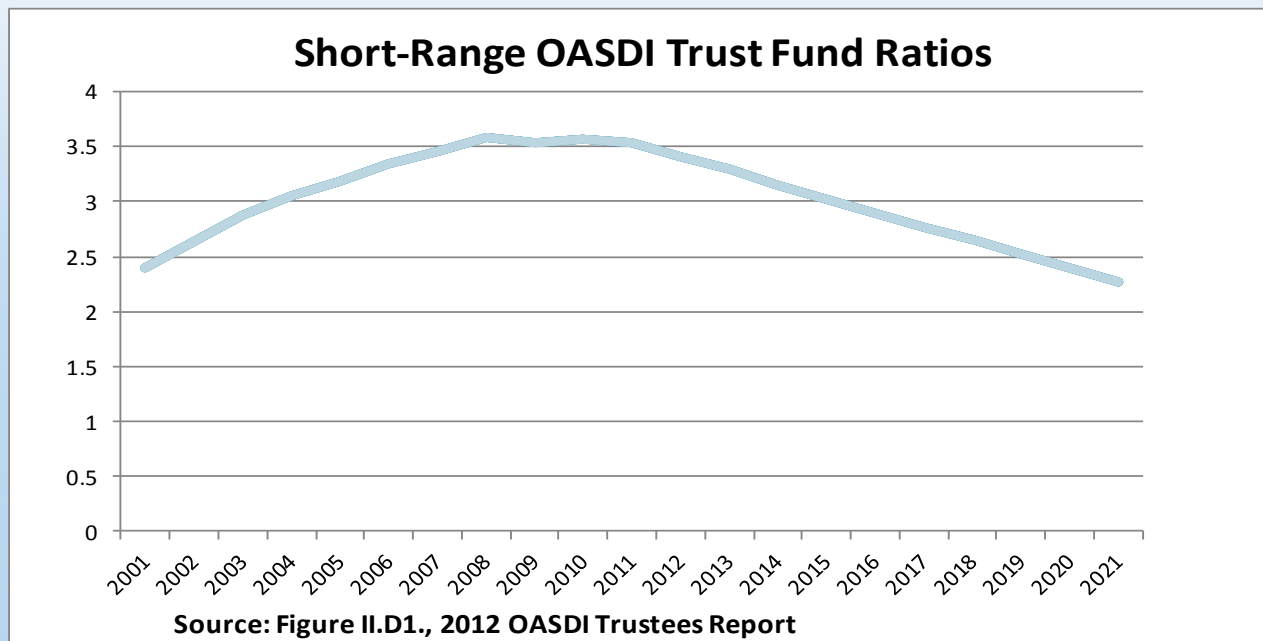
# Short-Range Projections

- Combined OASI and DI trust funds assets:
  - Expected to grow from \$2,678 billion at beginning of 2012 to \$3,061 billion at beginning of 2021
  - Thereafter, assets expected to decline



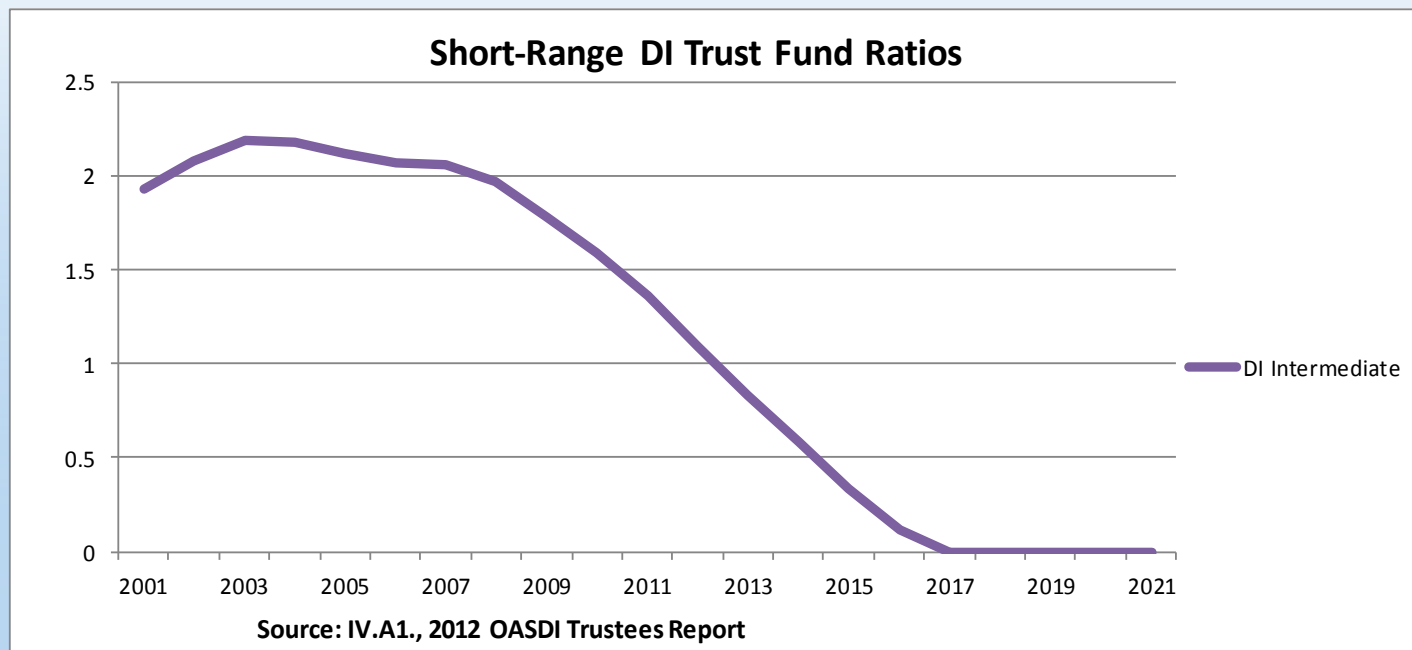
# Short-Range Projections, cont.

- Ratio of assets to cost continues to decline
  - 340% for 2012 to 227% for 2021
  - Prior year's ratios were 347% and 272% at 2012 and 2021, respectively



# Short-Range Projections, cont.

- DI Trust Fund expected to decline rapidly
  - Falls below 100% at beginning of 2013
  - Exhausted by 2016





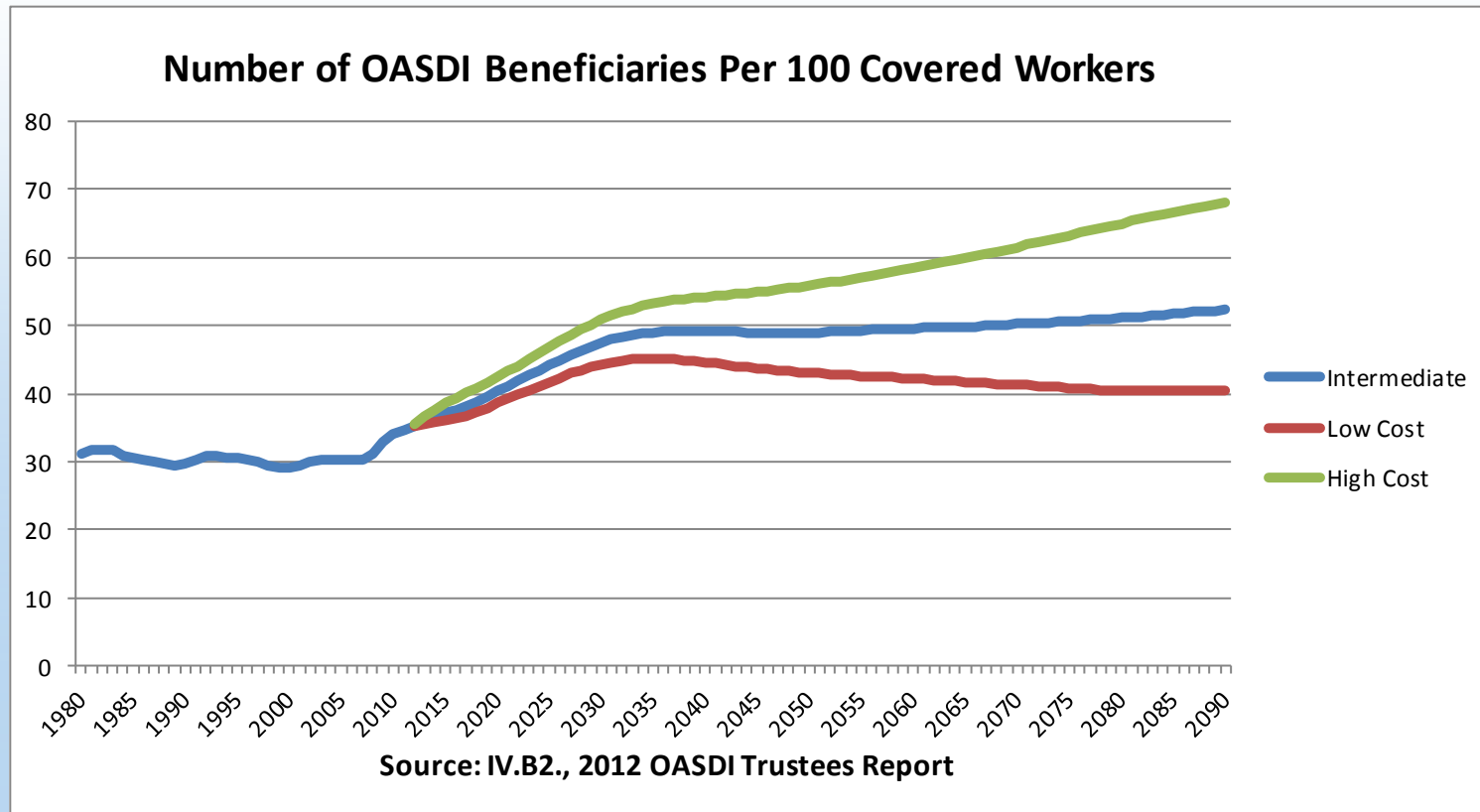
# Change in Short-Range Projections from 2011 Trustees Report

- Change in valuation period reduced the trust fund ratio by 13 percentage points
  - Prior period was 2011 to 2020
  - Current period is 2012 to 2021
- Changes in demographic assumptions reduced the trust fund ratio by only 2 percentage points
- Actual economic data and changes in assumptions reduced the trust fund ratio by 53 percentage points
  - Actual cost-of-living increase for December 2011
  - Lower interest rates
  - Slower growth in average earnings
  - Higher unemployment rates



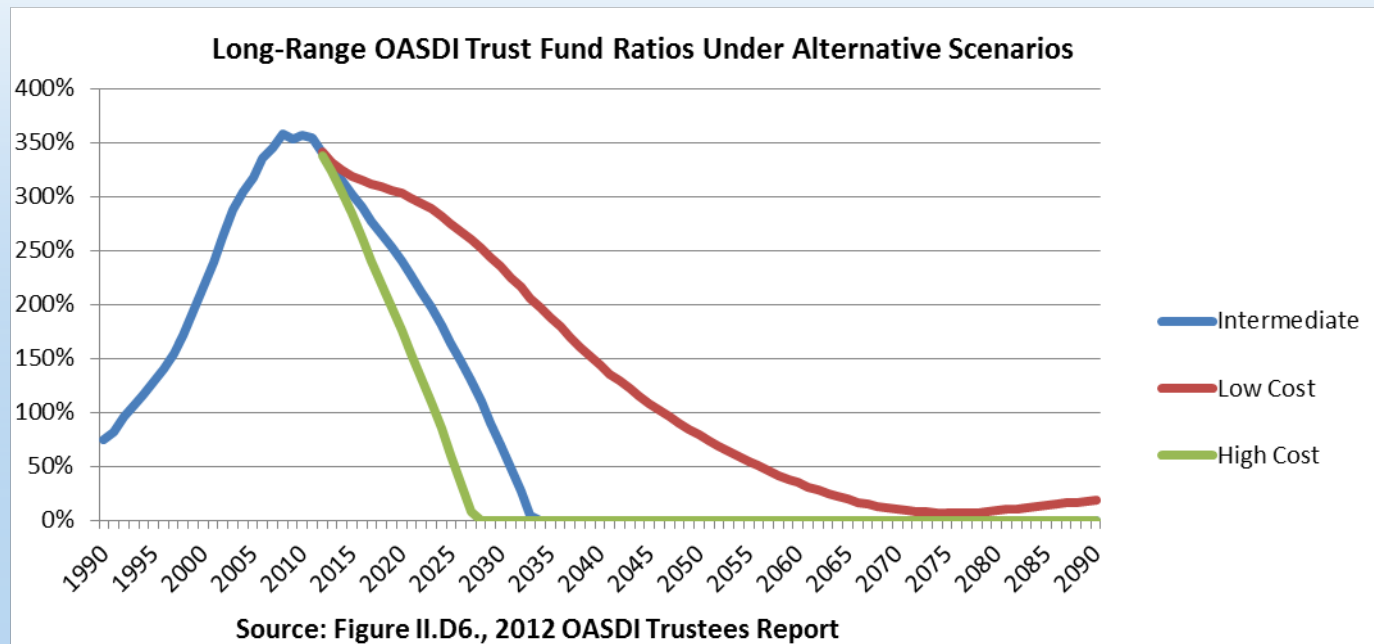
# Long-Range Results

## ■ Number of OASDI beneficiaries per 100 Covered Workers



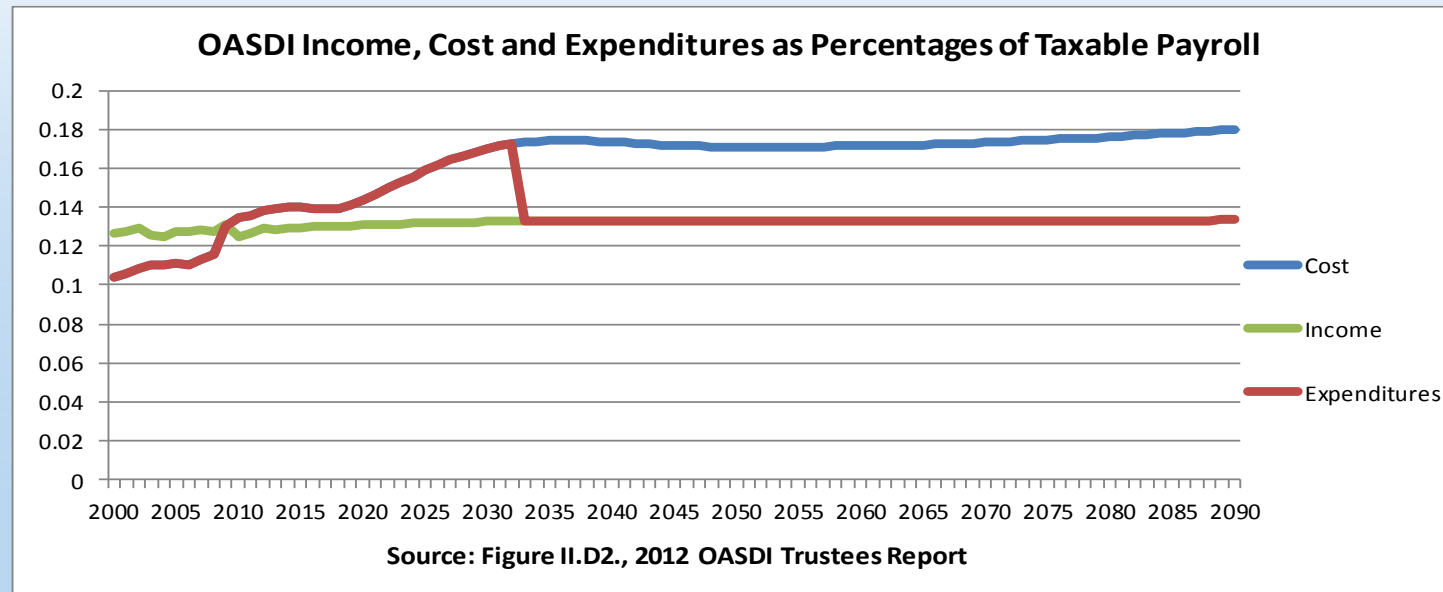
# Long-Range Results, cont.

- Combined trust funds decline beginning in 2021 until exhausted in 2033
  - Separately, DI exhausted in 2016
  - OASI exhausted in 2035
  - Two to three years earlier than prior projection



# Long-Range Results, cont.

- Projected OASDI annual cost rate increases from
  - 13.83% of taxable payroll for 2012 to
  - 17.41% for 2035 to
  - 17.83% for 2086
  - 4.50% of taxable payroll more than the projected 2086 income rate

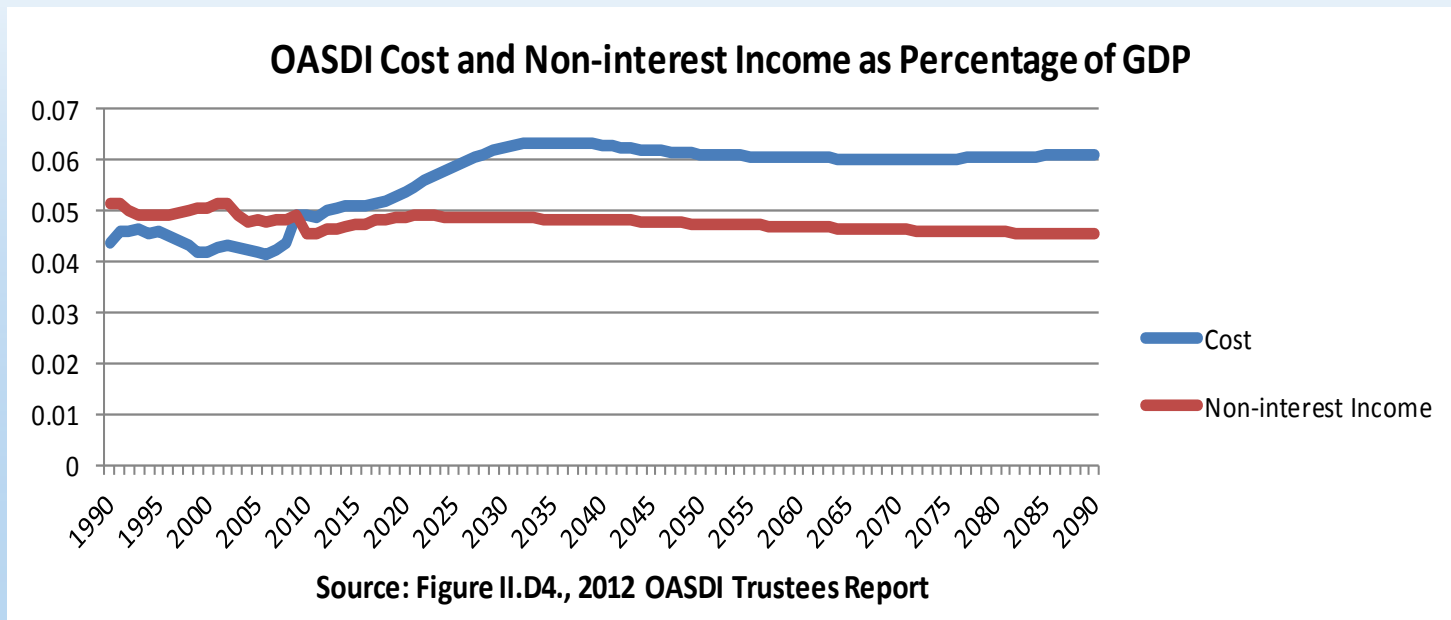


Expenditures are benefits payable after trust fund exhaustion in 2033



# Long-Range Results, cont.

- Projected OASDI cost relative to GDP increases from:
  - 5.0% of GDP currently to
  - 6.4% in 2035 and then declines to
  - 6.1% in 2055 and after



# Long-Range Results, cont.

- Summarized Income Rates are the sum of:
  - Scheduled payroll taxes;
  - Income from taxation of scheduled benefits;
  - Reimbursements from the General Fund; and
  - The starting trust fund value.
    - Expressed as a percentage of taxable payroll
- Summarized Cost Rates are the sum of:
  - Scheduled benefit payments;
  - Administrative expenses;
  - Certain other costs; and
  - The cost of reaching a target trust fund of 100% of end of period annual cost.
    - Expressed as a percentage of taxable payroll
- Actuarial deficit, the difference between the Summarized Income Rate and the Summarized Cost Rate, for the 75-year period is 2.67% of taxable payroll
  - Based on Intermediate Assumptions



# Change in Long-Range Projections from 2011 Trustees Report

- No changes to ultimate demographic assumptions
  - Updated starting values and transition to ultimate assumptions decreased actuarial balance by 0.05% of taxable payroll
- One ultimate economic assumption changed
  - Annual rate of change in average hours worked now assumed to decline slightly
- Updated starting values and changes in near-term economic growth rate assumptions
  - 0.14% of taxable payroll decrease in long-range actuarial balance
- Long-range actuarial balance (the negative of actuarial deficit) expected to:
  - Decline by 0.05% of taxable payroll due to change in valuation period
  - All other changes reduced actuarial balance by another 0.39% of taxable payroll



# Additional Resources

## American Academy of Actuaries Issue Briefs

- [\*An Actuarial Perspective on the 2012 Social Security Trustees' Report\*](#)
- [\*Understanding the Assumptions Used to Evaluate Social Security's Financial Condition\*](#)

## Social Security Administration

- [\*Social Security Office of the Chief Actuary\*](#)
- [\*The 2012 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds\*](#)





# Appendix

## 2012 Trustee Report Assumptions



# Demographic Assumptions

## Fertility Rate

Intermediate	Low-Cost	High-Cost
2	2.3	1.7

Source: Table II.C1, 2012 OASDI Trustees Report

## Net Immigration

Intermediate	Low-Cost	High-Cost
1,080,000	1,375,000	790,000

Source: Table II.C1, 2012 OASDI Trustees Report



# Demographic Assumptions, cont.

## Mortality

	Intermediate	Low-Cost	High-Cost
Average annual decrease in mortality	0.77%	0.39%	1.18%
Life expectancy in 2090	85.3	82.1	88.6

Source: Table II.C1, 2012 OASDI Trustees Report, Life Expectancy in 2090 - Table V.A3, 2012 OASDI Trustees Report, assuming 50% male, 50% female

## Disability Incidence (per 1,000)

Intermediate	Low-Cost	High-Cost
5.4	4.4	6.5

Source: Figure V.C3- DI Disability Incidence Rates, 2012 OASDI Trustees Report



# Economic Assumptions

Real Wage Differential =  
Wage Growth minus Consumer Price Index

	Intermediate	Low-Cost	High-Cost
Wage Growth	3.90%	3.50%	4.30%
Consumer Price Index	2.80%	1.80%	3.80%
Real Wage Differential	1.10%	1.70%	0.50%

Source: Table II.C1 and Table V.B1, 2012 OASDI Trustees Report



# Economic Assumptions, cont.

## Interest Rate

Intermediate	Low-Cost	High-Cost
2.90%	3.40%	2.40%

Source: Table II.C1, 2012 OASDI Trustees Report

## Labor Force Participation

Intermediate	Low-Cost	High-Cost
66.80%	67.10%	66.60%

Source: Section V.B5, 2012 OASDI Trustees Report, assuming 50% male, 50% female



# Economic Assumptions, cont.

## Unemployment Rate

Intermediate	Low-Cost	High-Cost
5.50%	4.50%	6.50%

Source: Table II.C1, 2012 OASDI Trustees Report

## Growth Domestic Product Growth

Intermediate	Low-Cost	High-Cost
2.40%	1.50%	3.30%

Source: Table V.B1, 2012 OASDI Trustees Report



# Q & A



# American Academy of Actuaries

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