



Who Bears What Risk?

An Intergenerational Perspective

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Objective

- Paper examines how major economic risks are allocated
- **Macroeconomic focus**
 - On aggregate risk factors such as productivity growth, asset prices, demographic changes, health care cost
- **Policy emphasis**
 - Fiscal policy influences who bears what risks
 - Examples: Social security, Medicare, income taxes, public debt
- **Intergenerational perspective**
 - Future generations are naturally excluded from financial and insurance markets
 - Fiscal policy is particularly important for how aggregate risks are shared between current and future generations
 - Power of taxation = Power to commit future generations
- Paper abstracts from micro issues to focus on the overall allocation of risk over long time periods and across generations



Why do we care?

1. Because the aggregate risks are huge
 - How well-off will we (and our children) be 30-60 years from now?
 - Depends more on **future productivity growth** than on anything else
 - 3% growth/year ~ 140%/generation ~ 500%/two generations
 - How can we finance the retirement of an aging population?
 - Problems/burdens depend on **uncertain trends in longevity & fertility**
 - How can we finance health care expenses?
 - Substantial uncertainty about **future medical innovations and their cost**
 - New here: Treat medical expenses as macroeconomic risk factor.
2. Because aggregate risks can be managed through risk sharing.
 - Better risk sharing can produce welfare gains for everyone.
3. Because fiscal institutions *are* in fact re-allocating risk
 - It's happening, therefore worth understanding.
 - Essential for discussing fiscal policy reforms.



Policy Examples

1. Who ensures that social security is safe?
 - Key distinction: **Defined Benefits (DB)** vs. **Defined Contributions (DC)**
 - Defined Benefits require that future generations bear the risk of unexpected economic and demographics changes. Tax rates must vary.
 - Vs. Defined Contributions: fixed tax rates imply uncertain benefits.
 - Choice perhaps obscured by trust fund accounting, but unavoidable.
2. Who would bear the risk of equity investments in social security?
 - In personal/individual accounts: Do account holders bear the risk?
 - Not true if returns are 'guaranteed' or if there are means-tested benefits.
 - In trust fund holdings (Clinton plan): Future generations?
 - True with defined benefits, but not true in a DC system.
3. Who bears the financial risks of Medicare?
 - Full coverage of cost = Defined Benefit: Risk for taxpayers.
 - Voucher plan like Kotlikoff-Burns (2004): Risk for retirees.



Systematic Analysis of Risk Sharing

- Recognize the mechanisms that allocate aggregate risks:
 - **Financial and insurance markets**: can eliminate idiosyncratic risks, but they can't diversify away aggregate risks.
 - Within-family risk sharing: imperfect even for idiosyncratic risks.
 - International risk sharing: puzzlingly imperfect (Home Bias)
 - **Fiscal policy**: Impact through taxes, transfers, and public debt.
- Ask three questions for each of the major risk factors:
 - **Who bears how much risk?**
 - Some empirical evidence (not much - would require very long run data)
 - Simple overlapping generations model calibrated to U.S. data
 - **What allocation of risk would be efficient?**
 - **Benchmark of proportional sharing**: In response to any disturbance, everyone's consumption would change by the same percentage amount.
 - **How would alternative policies alter the allocation of risk?**
 - Obtain qualitative insights from the economic model; quantitative findings from the calibration. Both put current U.S. fiscal policy in perspective.



Answers to: Who Bears What Risk in the United States?

I. Macroeconomic Risks

1. **Uncertain productivity growth:**
Difficult to find a more important issue (Robert Lucas)
 2. **Uncertain asset values:**
Reason why capital income is more risky than labor income
- Theoretical results in a Diamond (1965) style overlapping generations framework with Cobb-Douglas production:
 - **Productivity risk falls more on wages than on capital income**
Under plausible assumptions about labor supply and savings, working-age consumption is more exposed to productivity risk than retiree consumption.
 - **Asset valuation risk falls primarily on retirees**



Empirical Evidence

- Bohn (2004):
 - U.S. data for 1875-2002 GDP and the S&P500.
 - Compute 30-year ahead 'generational' covariance matrices.
 - Point estimates for 30 years ahead (variables in logs)
 - 35% standard deviation of GDP
 - 64% standard deviation of S&P500 returns
 - 41% correlation between GDP and returns
 - Structural interpretation:
 - Return on capital = π * GDP-factor + Valuation factor
 - Return on capital = weighted return on equity & debt
- Key finding: Return on capital varies less than proportionally with economic growth
 - Weight $\pi = 0.58$ on GDP in the return equation
 - Also: 43% standard deviation of valuation risk
 - Perhaps an overestimate - aggregate capital is more diversified than the S&P500
 - Estimates consistent with the overlapping generations model



Policy Implications

- Efficient risk sharing would call for fiscal policy to
 - Shift more productivity risk to the retiree generation
 - Shift more valuation risk to working-age cohorts
- Actual U.S. policies:
 - Safe debt shifts productivity risk *away* from retirees (-)
 - Inflation-indexed social security benefits (at ages > 60) shift productivity risk *away* from retirees (-)
 - Capital income taxes shift valuation and productivity risk away from retirees (+/-)
- Comparison favors increased wage-indexing of retiree transfers and wage- or GDP-indexed public debt (but not inflation-indexing.).
Quantitative analysis is in the paper.



II. Demographic Risks

1. **Uncertain fertility/cohort size**
 - Small cohorts earn higher wages and higher returns on retirement savings than larger cohorts
 - Efficient risk sharing calls for transfer to unusually large cohorts
 - For example via defined-benefits social security
 - Case for maintaining benefits for the baby-boom generation

2. **Uncertain longevity** (life expectancy in retirement)
 - The good fortune of **living long is financially bad news**.
 - Risk sharing calls for transfer to cohorts living unexpectedly long.
 - Supports defined-benefits social security
 - Does efficiency imply growing transfers as longevity rises?
 - No: Only unexpected longevity is insurable, not the trend path.
 - Consistent with linking retirement age to *expected* longevity, provided benefits are determined in advance (e.g. 1983 reform)



III. Uncertain Health Care Expenses

- Health care expenses exceed 14% of U.S. GDP
 - Huge uncertainty about future growth
 - Worth treating as a macroeconomic risk factor
 - Generational aspect: Health care expenses increase with age
 - Who should bear the risk of uncertain expenses for retirees?

- Analysis explores two contrasting views
 - The 'unavoidable needs' view:
 - Everyone is entitled to receive state-of-the-art health care.
 - Rising health care expenses are a burden sharing issue.
 - The 'elastic demand' view:
 - Medical innovations reduce the quality-adjusted price of health care
 - Rising health care expenses reflect a price-elastic demand.



How are medical expenses shared efficiently?

- Implications of the unavoidable needs view:
 - If health care expenses rise unexpectedly, efficient risk sharing calls for **increased transfers** from working-age cohorts to retirees.
 - But no full insurance: Also reduced retiree non-medical consumption.
- Implications of the elastic demand view:
 - Medical innovations benefit retirees more than younger cohorts.
 - Then efficient risk sharing calls for **reduced transfers** to retirees.
- Robust conclusion: No, or at most partial, intergenerational funding for unexpected retiree medical expenses
 - Versus actual funding: largely public (65%); payroll tax for Medicare.
 - Raises questions about well-known scary fiscal projections:
 - Estimates like Gokhale-Smetters \$38 trillion for Medicare assume full insurance. Implied by the **Fiscal balance rule** of **Generational Accounting**
 - Not clear why we should be responsible for future generations' cost of using medical technologies not yet invented & not available to us.



Also Addressed in the Paper:

- What about the Risk of War?
 - Nothing new: Risk sharing is the standard paradigm for war financing (principles of burden sharing, tax smoothing).
- What about International Risk Sharing?
 - Remarkably incomplete and clearly far from efficient.
 - Data indicate that U.S. residents hold largely debt-financed claims on foreign assets. Foreigners hold part of the U.S. capital stock.
 - Foreign assets are not yet a major risk factor.
- Is economic growth endogenous with respect to risk sharing?
 - Argument analogous to Obstfeld's (1994) international risk sharing paper.
 - If better risk sharing encourages adoption of higher-risk higher-return technologies, it may raise the expected rate of economic growth.
 - Potential for huge welfare gains, though speculative.



Conclude

- Aggregate risks are huge and unavoidable.
- Fiscal policy influences who bears these risks
 - Intergenerational aspect: Government ability to commit future generations.
 - Risk Sharing is a useful perspective: Focus on efficiency, not redistribution.
- Summary assessment of risk sharing in the United States:
 - Working-age cohorts are more exposed to productivity risk than retirees.
 - By providing safe claims to retirees, fiscal policy magnifies generational imbalances.
 - Retired cohorts bear more asset valuation risk than working-age cohorts.
 - Capital income taxes help share this risk.
 - Being in a large cohort and living long are financial negatives.
 - Pay-as-you-go transfers with defined benefits help share both demographic risks.
 - For health care cost, no strong case for intergenerational financing.
 - Contrasts with payroll-tax and other public financing of retiree medical expenses.