The Impact of Global Aging on Saving, Investment, Asset Prices, and Returns

for the Q Group – The Institute for Quantitative Research in Finance

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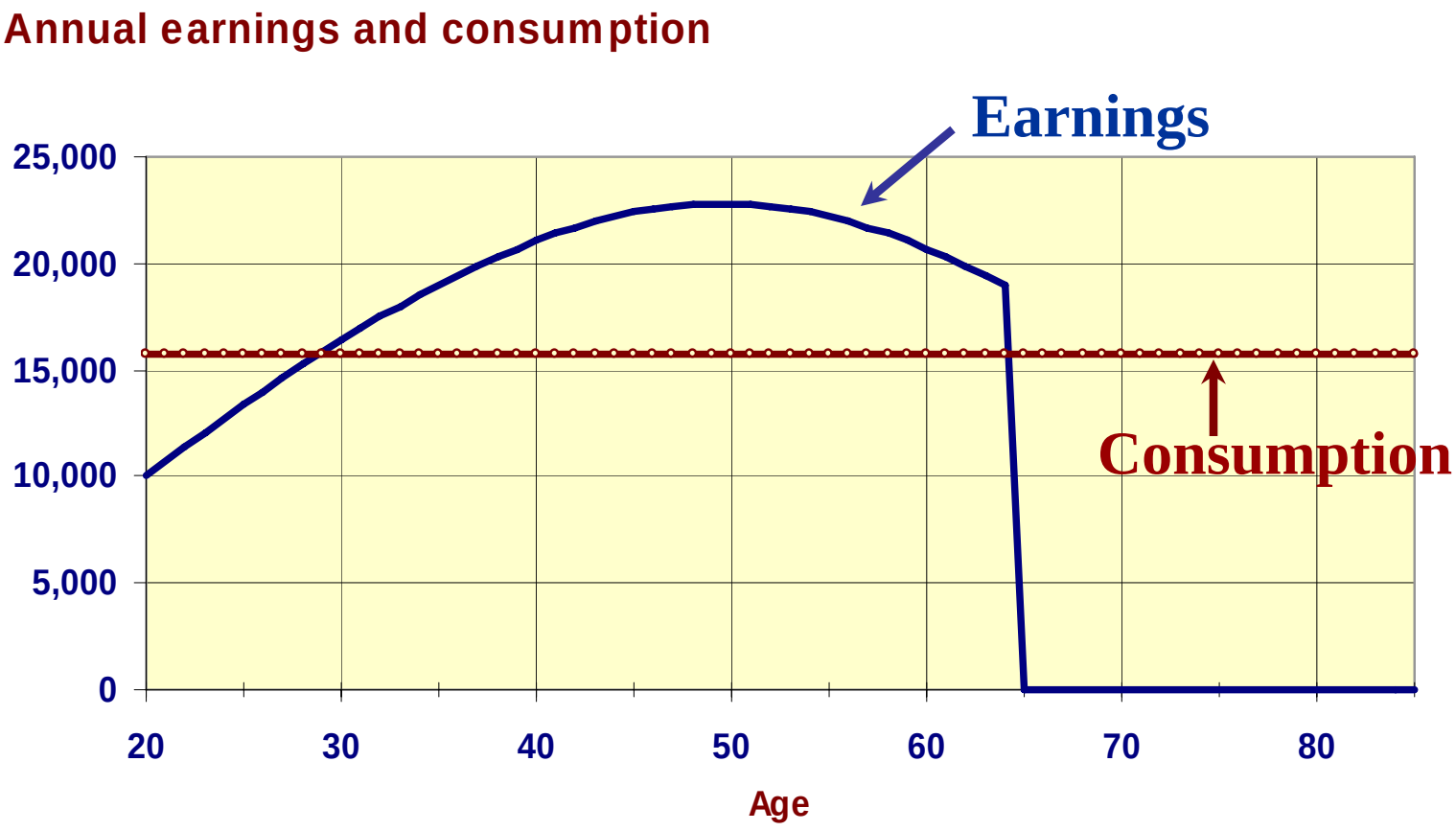
Population ageing is occurring in nearly all countries

- In rich countries, aged population obtains much of its income & consumption from government budgets
- Populations in both rich and poor countries are growing older
  - Falling mortality rates / Longer life expectancy
  - Declining fertility
  - Immigration is variable & uncertain

Impact of ageing on financial markets and the economy

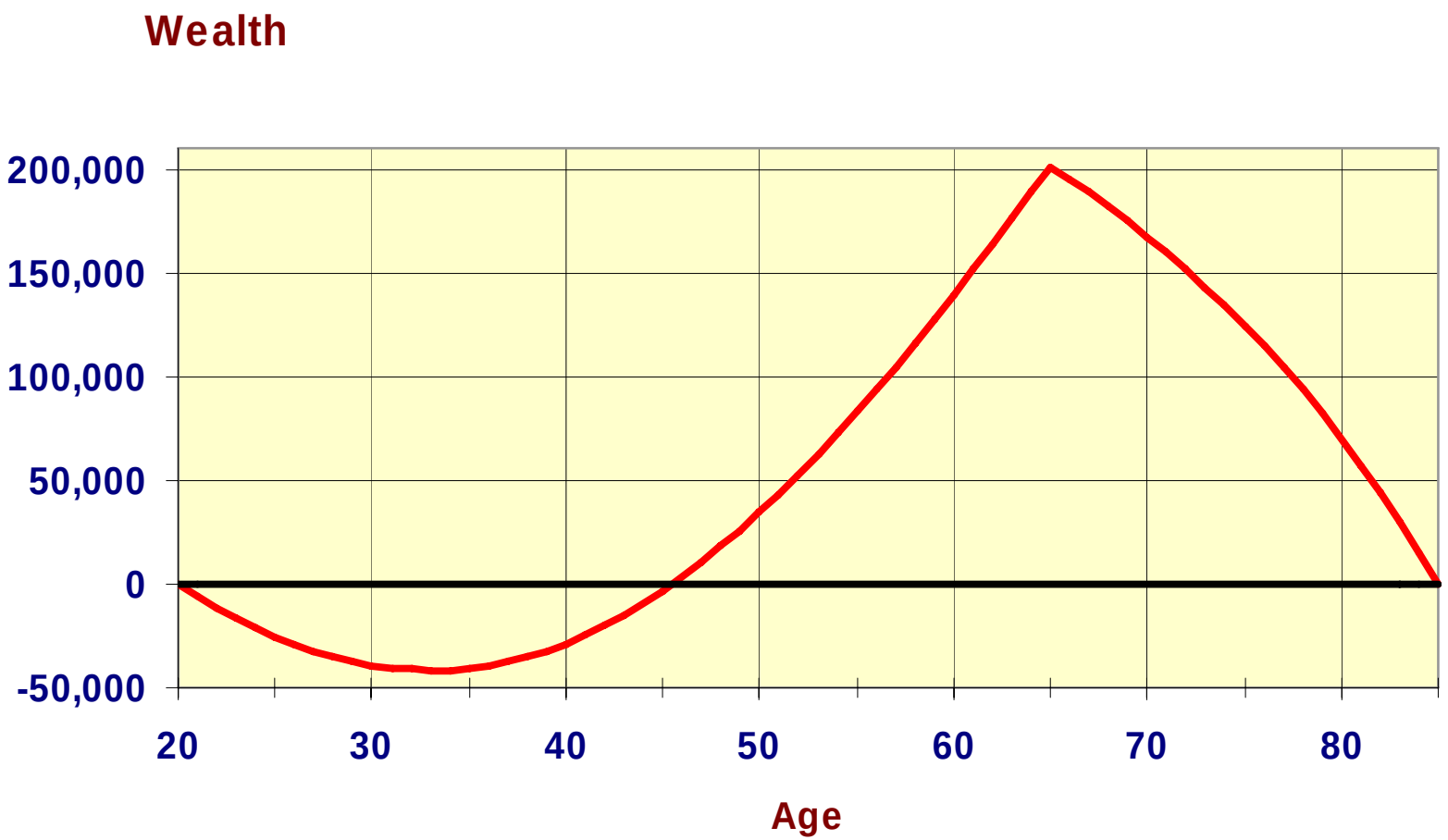
- **Relative declines in rates of saving and investment**
  - Will aged societies be net lenders or net borrowers (current account balance)?
- **Implications for asset prices and returns**
- **Open-economy aspects**
  - Current account balance (national saving less domestic investment)
  - Interaction with demographic change

Life-cycle consumption theory: Age profile of saving



The difference is annual saving or dissaving.

Life-cycle consumption theory: Wealth accumulation

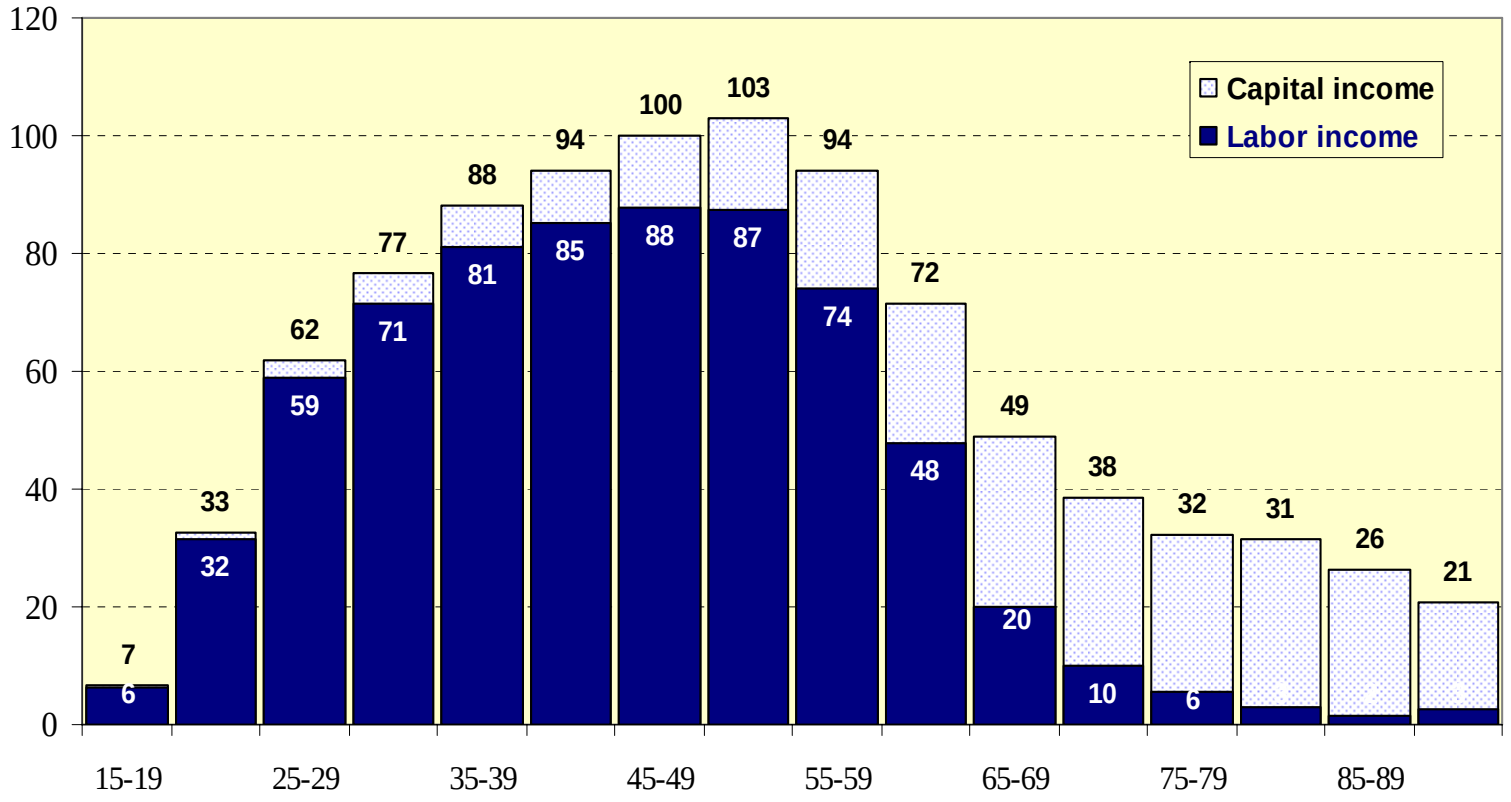


Do changes in the *age structure* have the impact on aggregate household ***saving*** implied by the life-cycle hypothesis?

- Microeconomic analysis
  - Weak life-cycle influences
  - Many people have no significant retirement saving
  - Highly disparate patterns of wealth accumulation complicates aggregation
  - Average dollar, not average person
    - Wealthy savers have out-size effect on aggregate saving
  - Importance of cohort effects

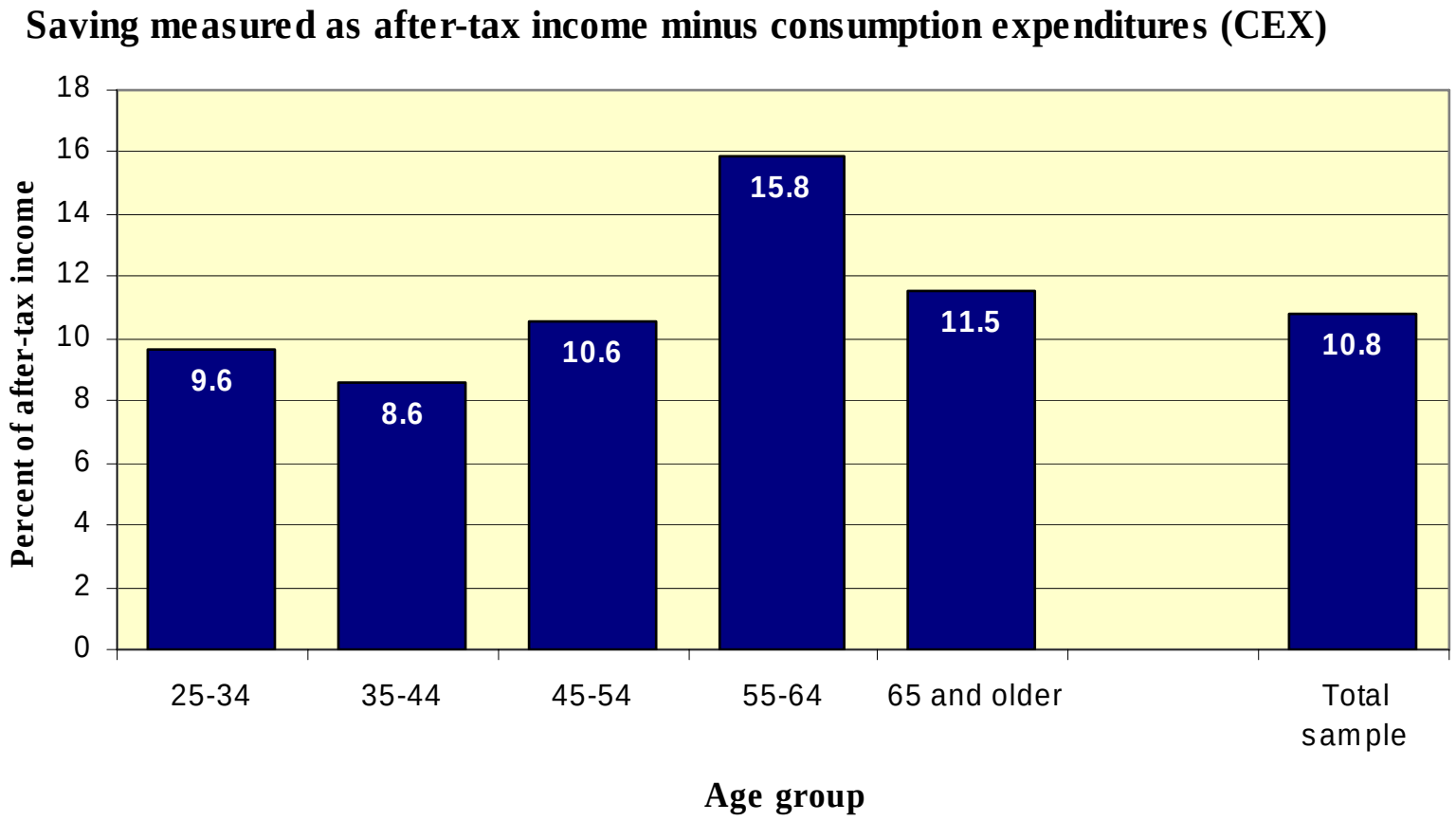
Life-cycle consumption theory: Cross-Section Data

Factor income received by average 45-49 year-old = 100



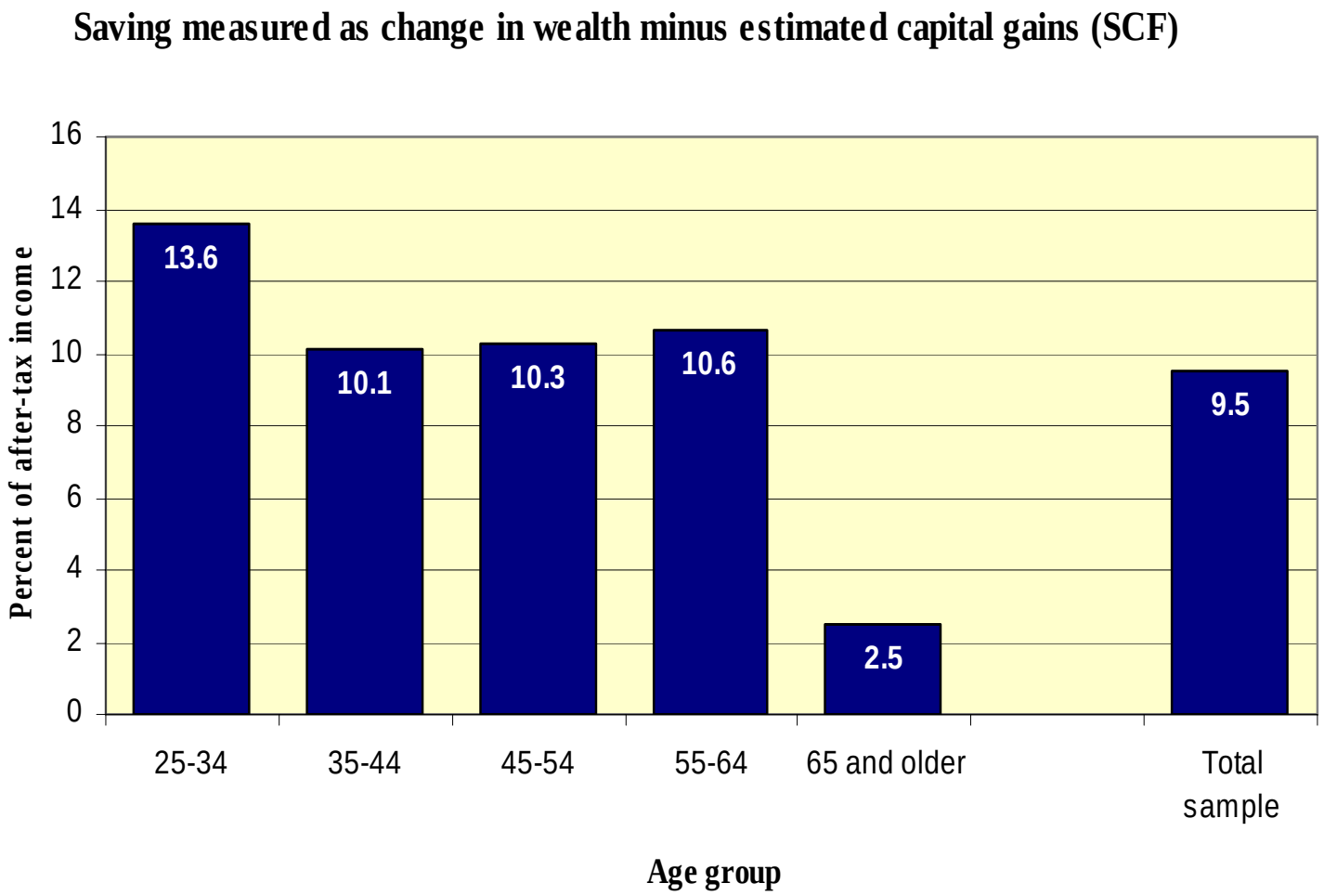
Age group: **United States**

Age pattern of U.S. saving rates: Consumption Survey Results



Source: Bosworth, Burtless & Sabelhaus (1991).

Age pattern of U.S. saving rates: Wealth Survey Results



Source: Bosworth, Burtless & Sabelhaus (1991).

Macroeconomic analysis

- Shows stronger evidence of demographic effects on saving
  - Most pronounced for Asia
  - Results for industrial economies sensitive to countries and time period.
  - ***But*** **–** the aggregate trend in personal saving often contradicts theory's prediction: U.S. saving has *declined* since mid-1980s.
- Multi-country panel data sets
  - Cross-national differences are correlated with other determinants.
  - Within-country demographic changes are small compared to changes in saving

Do changes in the *age structure* have the impact on ***investment*** demand implied by the life-cycle hypothesis?

- Slower labor force growth should reduce growth of required capital stock.
- Limited research on link between labor force growth and technical change

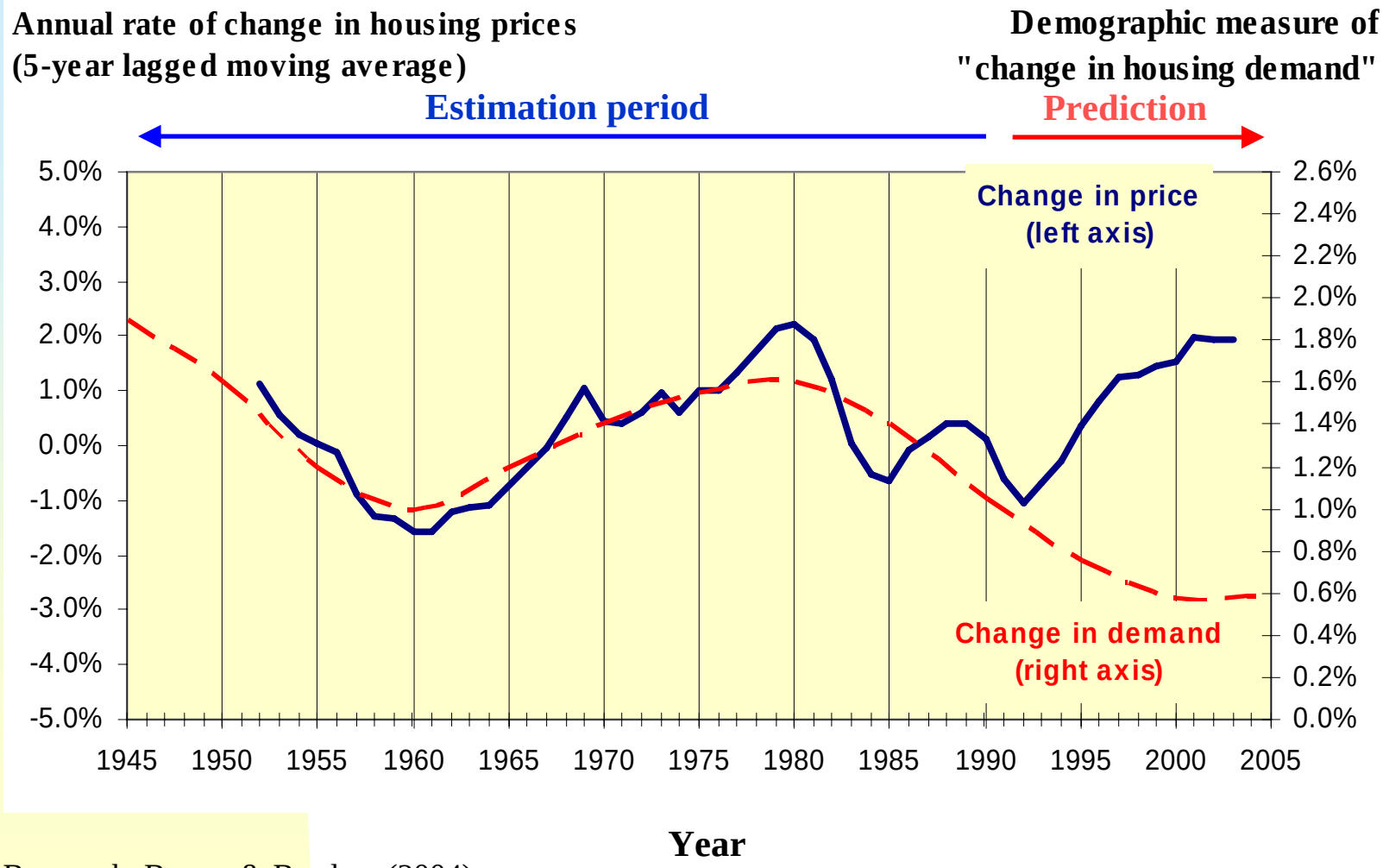
There are only a few studies of impact of aging on investment demand.

- Higgins (1998) concludes that the decline in investment will exceed that of saving for high-income economies out to 2025.
- Bosworth and Keys (2004) also obtained strong demographic effects, but --
  - **Decline in saving projected to exceed that of investment by 2050**
  - **High-income countries would have current account deficits.**

Do changes in the *age structure* have a significant impact on ***asset prices***?

- Asset prices assumed to vary in response to changes in the capital-output ratio.
  - Price of capital assumed to depend on marginal product, or relative scarcity
  - Age-related demand for assets
- Mankiw-Weil (1989) – Housing
  - Demographically determined asset prices

Problem with Mankiw-Weil prediction



Source: Bosworth, Bryant & Burtless (2004).

- **Pension fund accumulation and decumulation**
  Schieber-Shoven (1997)

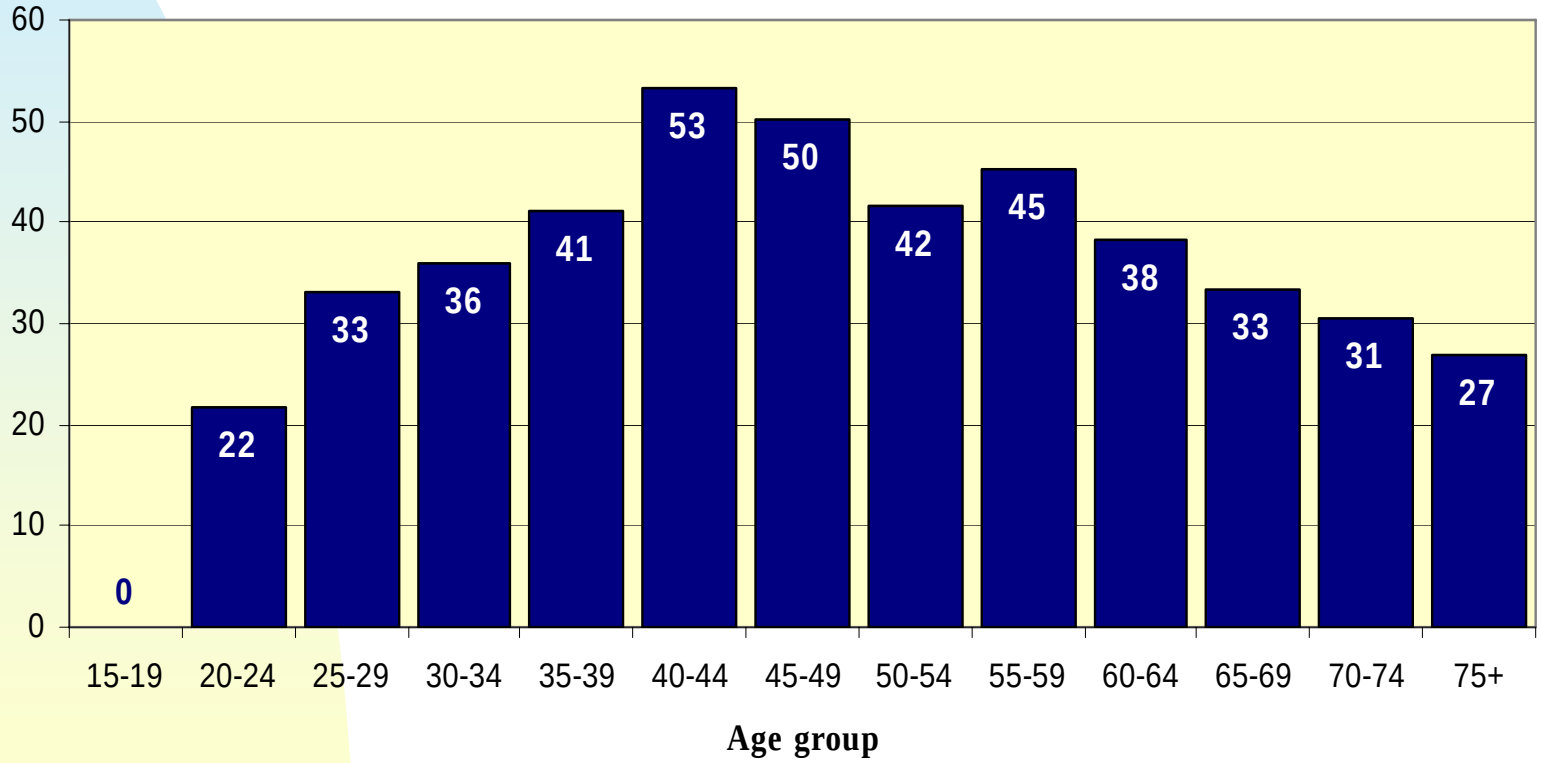
- **Age-related portfolio preferences**
  Poterba (2001) and Davis and Li (2003)

  - Proportion of portfolio devoted to risky assets rises up to age 60, but does not decline much thereafter

  - Effects of demographic structure on returns varies across countries

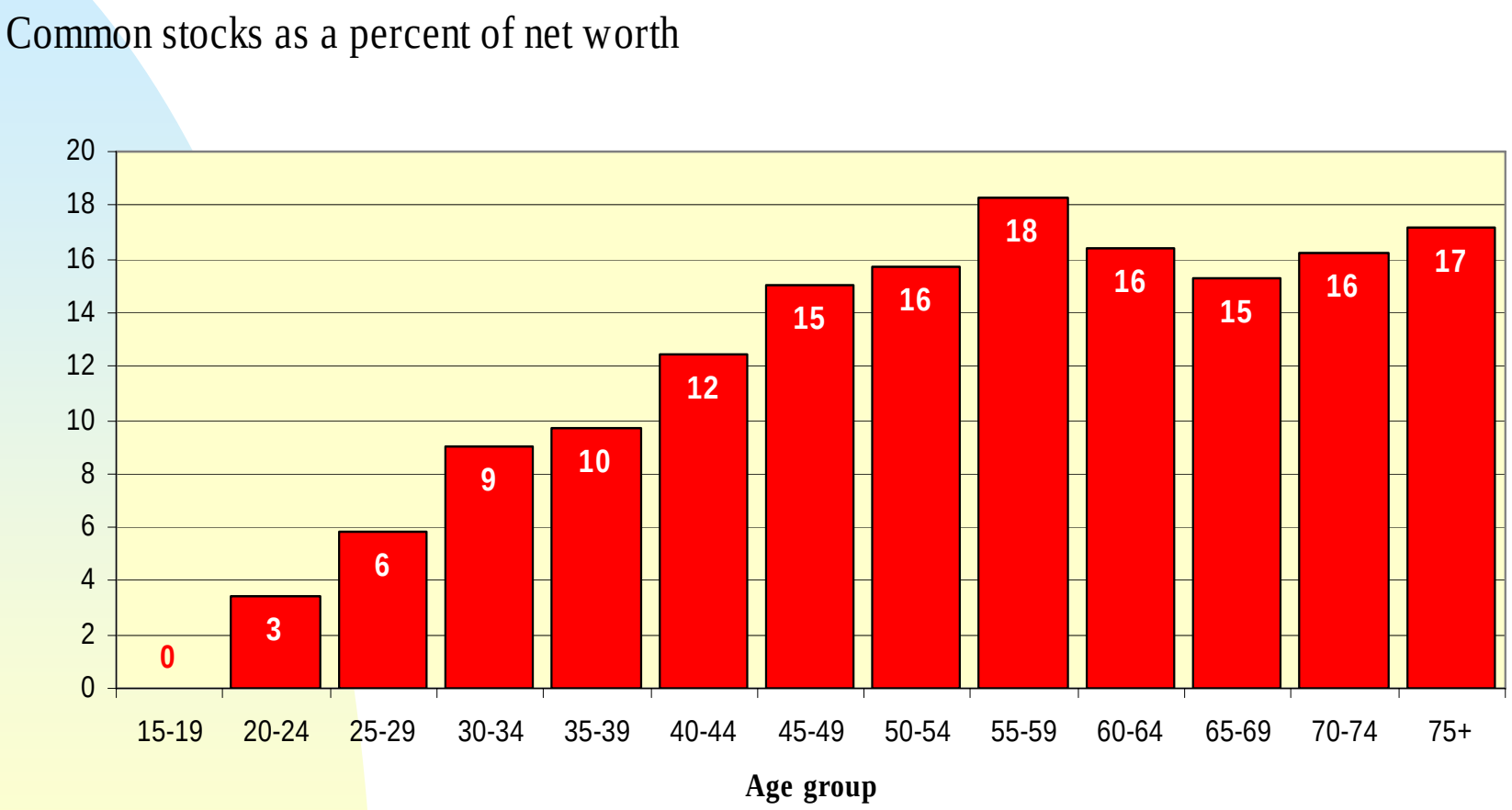
Age pattern of household portfolios:
Risky asset as % of net financial assets (U.S.A.)

Common stocks as a percent of net financial assets



Source: Poterba (2001).

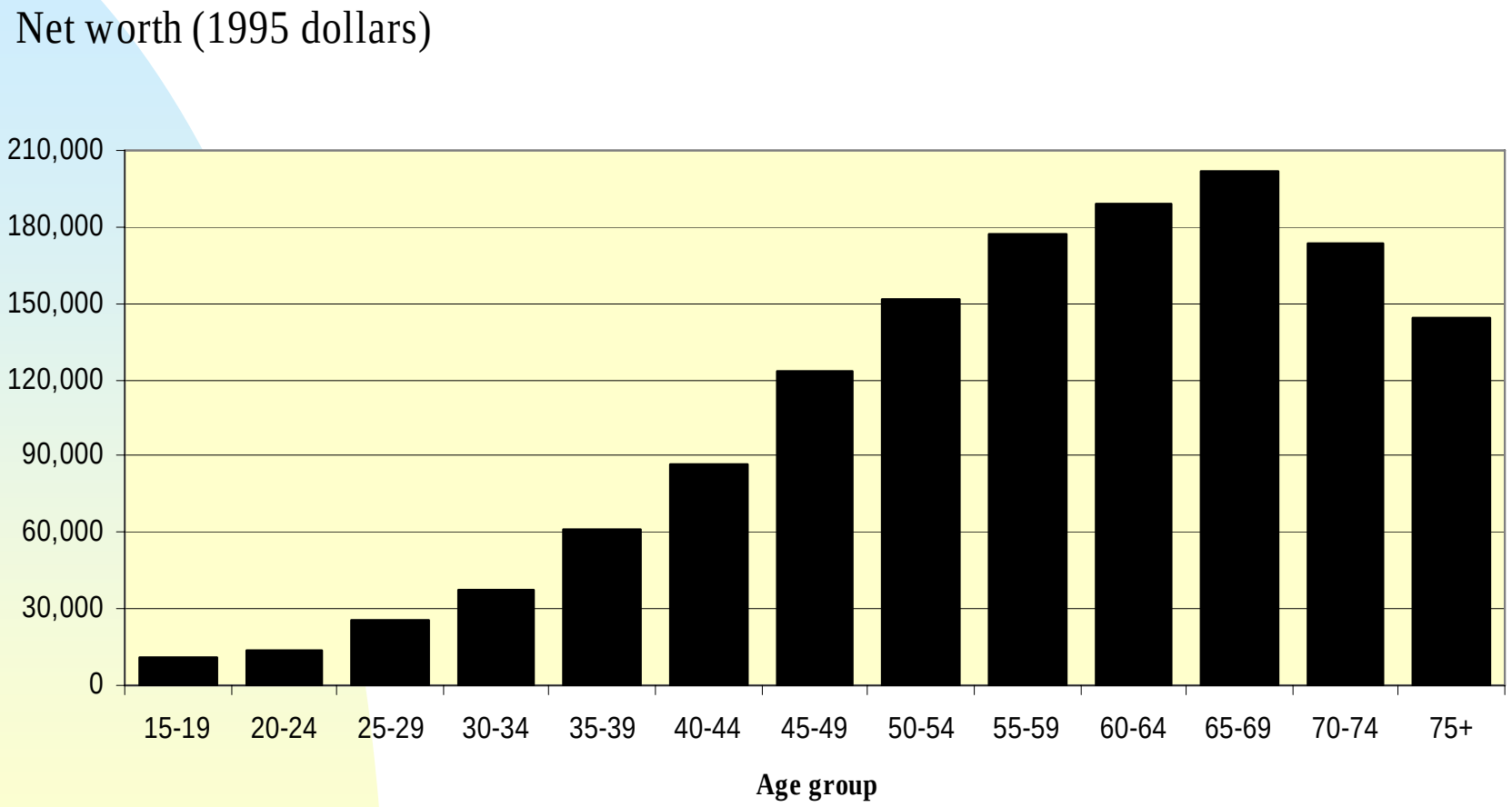
Age pattern of household portfolios:
Risky asset as % of household net worth (U.S.A.)



Source: Poterba (2001).

Age pattern of household net worth:

Tabulations of U.S. Survey of Consumer Finances (1983-1995)



Source: Poterba (2001).

Research Agenda

- **Saving**
  - There is a large disconnect between the micro and macroeconomic research on saving
- **Investment**
  - Panel data for large sample of countries in order to refine estimates of demographic effects
  - Linkage between labor force growth and technological change
- **Asset Prices**
  - Improve the microeconomic data to incorporate pension funds

Cross-Border Impacts of Aging

Enhanced Cross-Border Economic Integration

- **2 sets of underlying causes:**
  - Technological innovations and social/cultural changes reducing economic and psychic distances between nations
  - Lowering of barriers at borders
- **2 secular trends in cross-border "substitutabilities":**
  - **Goods:** household and firms more willing to substitute home and foreign goods in response to relative price changes
  - **Financial:** savers and investors responding more strongly across borders or currencies to changes in relative expected returns

Implications for an Economy's Saving-Investment Balance

- **Macroeconomic variables more closely linked across borders than before**
- Macroeconomic adjustments channeled relatively more through external-sector transactions; cross-border and cross-currency adjustments more important relative to domestic adjustments
- **Hence larger swings in current-account balances due to heightened goods and financial "substitutabilities"**
- Larger imbalances occur, not only ex ante but also ex post, between national saving and domestic investment

Main conclusion to keep in mind –

- As economies become more open, there may be a reduction in the correlation between domestic investment and national saving.

- Equivalently, there may be a tendency for current-account imbalances to become larger and more variable.

- Hence cross-border and cross-currency adjustments to policy and non-policy shocks rise in importance relative to purely domestic adjustments.

Demographic Shocks in Open Economies

- Different pace and intensity of demographic change in the world, among developed economies, and especially between industrial and developing countries
- External-sector transactions, exchange rates and variations in current account balance are important parts of macroeconomic adjustments to demographic shifts

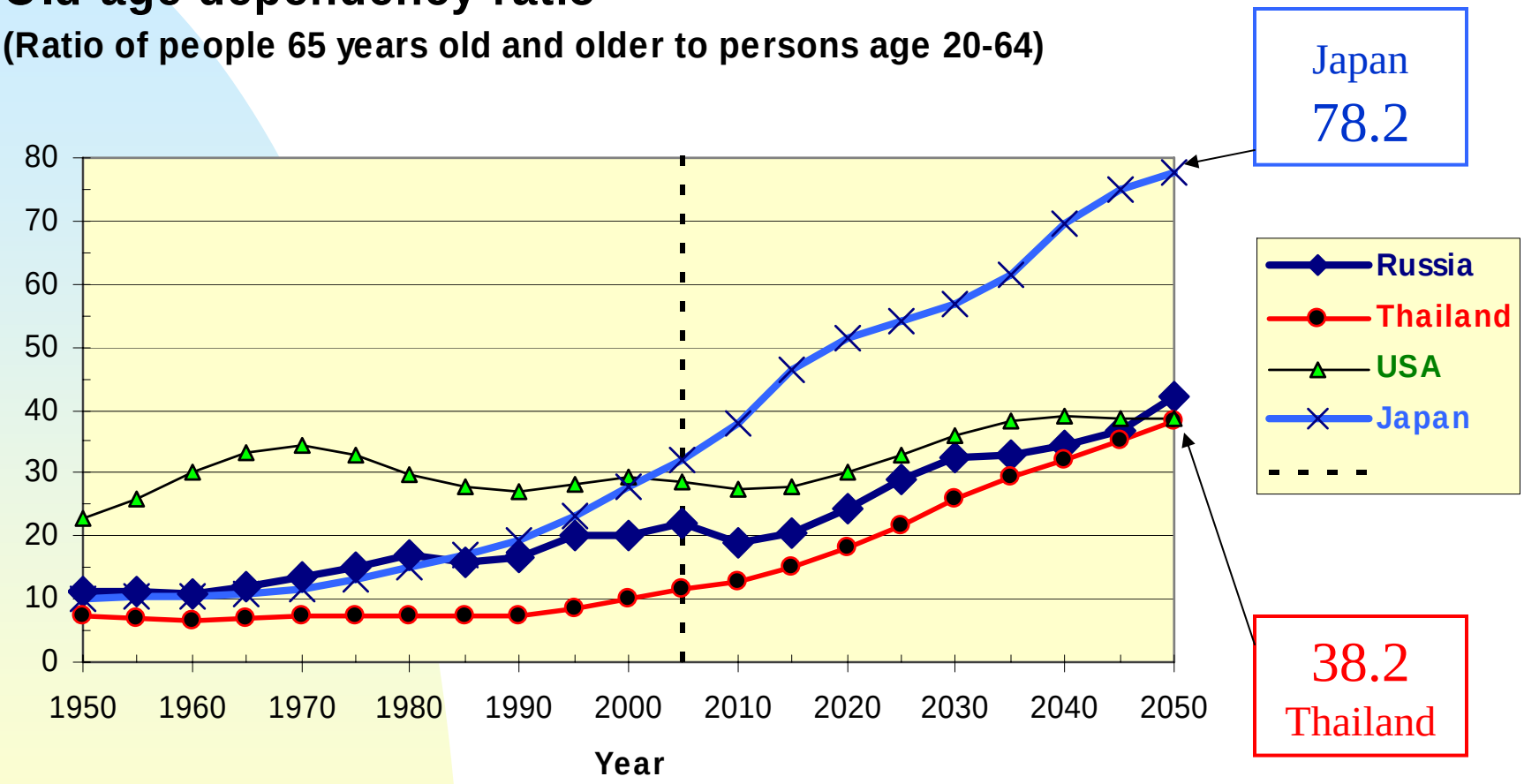
Uneven pace of population ageing across countries

- Fast-ageing areas
  - Europe
  - Korea
  - Japan
- Slow pace of ageing
  - Indonesia
  - Nigeria
  - Philippines
- Intermediate pace
  - USA / Canada
  - Australia
  - Latin America

Unequal change in old-age dependency

Old-age dependency ratio

(Ratio of people 65 years old and older to persons age 20-64)



Source: U.N. Population Projections (2004).

Demographic Shocks in Open Economies

- A nation's dependency ratios – youth and elderly – may be correlated with variations of its current account (S-I) balance
- International capital flows and external-sector goods transactions can "cushion" some of the impacts of demographic change on domestic macroeconomic variables.

Conclusions --

- Micro & macro studies find age profile roughly corresponds to life-cycle prediction
- BUT – micro studies show smaller effect of aging … possibly because pension saving is missed in micro studies
- Recent saving trends in many industrialized countries ***don't*** fit the theory: Aggregate saving has dropped *in spite* of more middle-aged savers
- Slower growth in working-age population should depress investment demand
- Whether *declining saving* or *shrinking investment demand* will have bigger effect is open question

Conclusions --

- Different age groups have different preferences for risky & non-risky assets
- In theory, this could mean that aging will influence demand for different asset classes and expected returns
- Micro & macro studies have found age effects on asset holdings and returns of different asset classes
  - In micro studies, demand for risky assets among very aged implies little if any decline in overall demand for risky assets in foreseeable future
  - Macro studies fail to uncover consistent pattern of change in asset demand with aging
  - My guess: The "predictable" impact of age structure on asset demand is small relative to unpredictable sources of change