

GLOBAL PENSION TRENDS – AN ACTUARIAL PERSPECTIVE

International Pension Seminar, Taipei

30-31 May 2005

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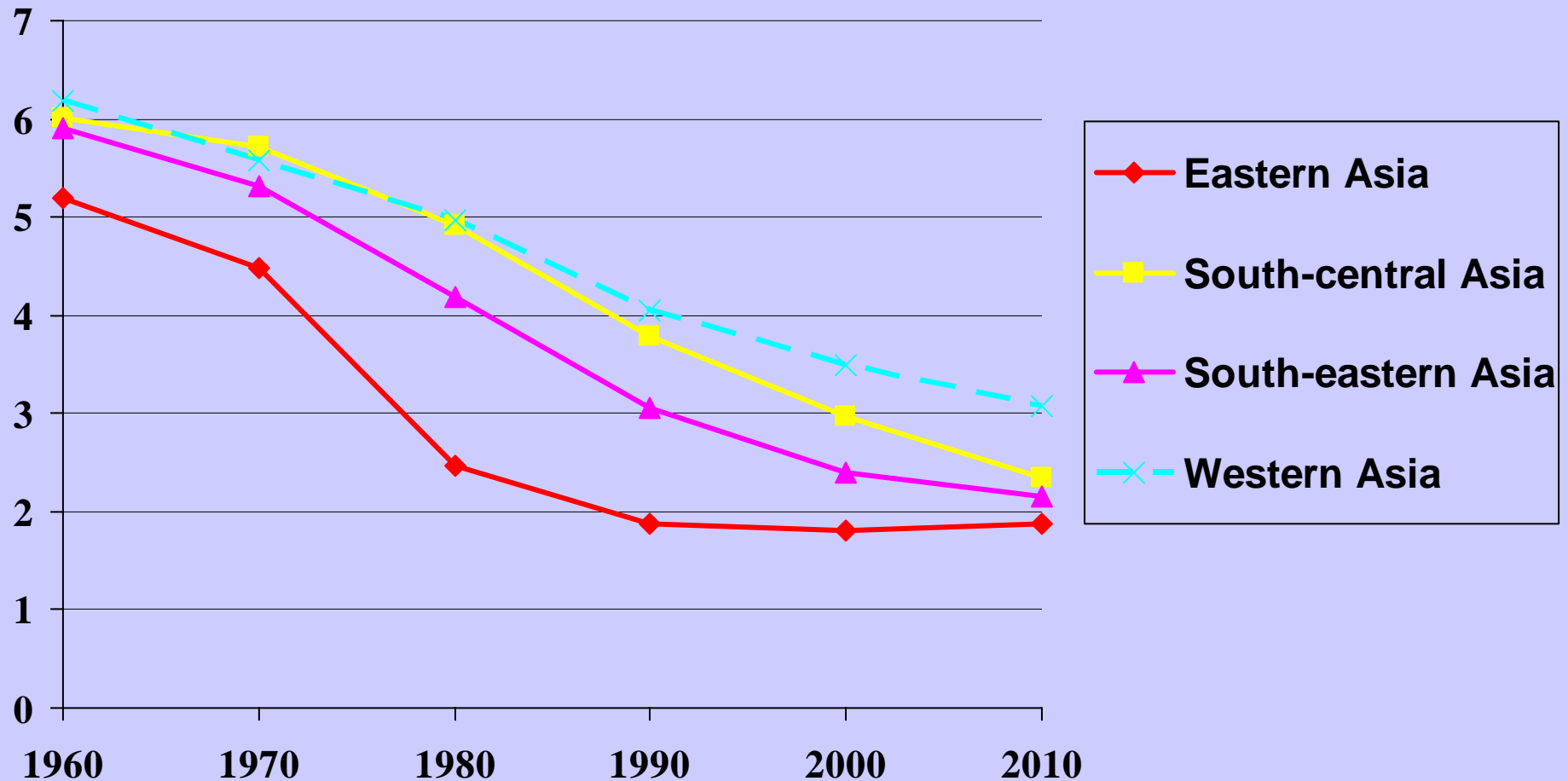
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CHALLENGES FACING PENSION AND SOCIAL SECURITY SYSTEMS

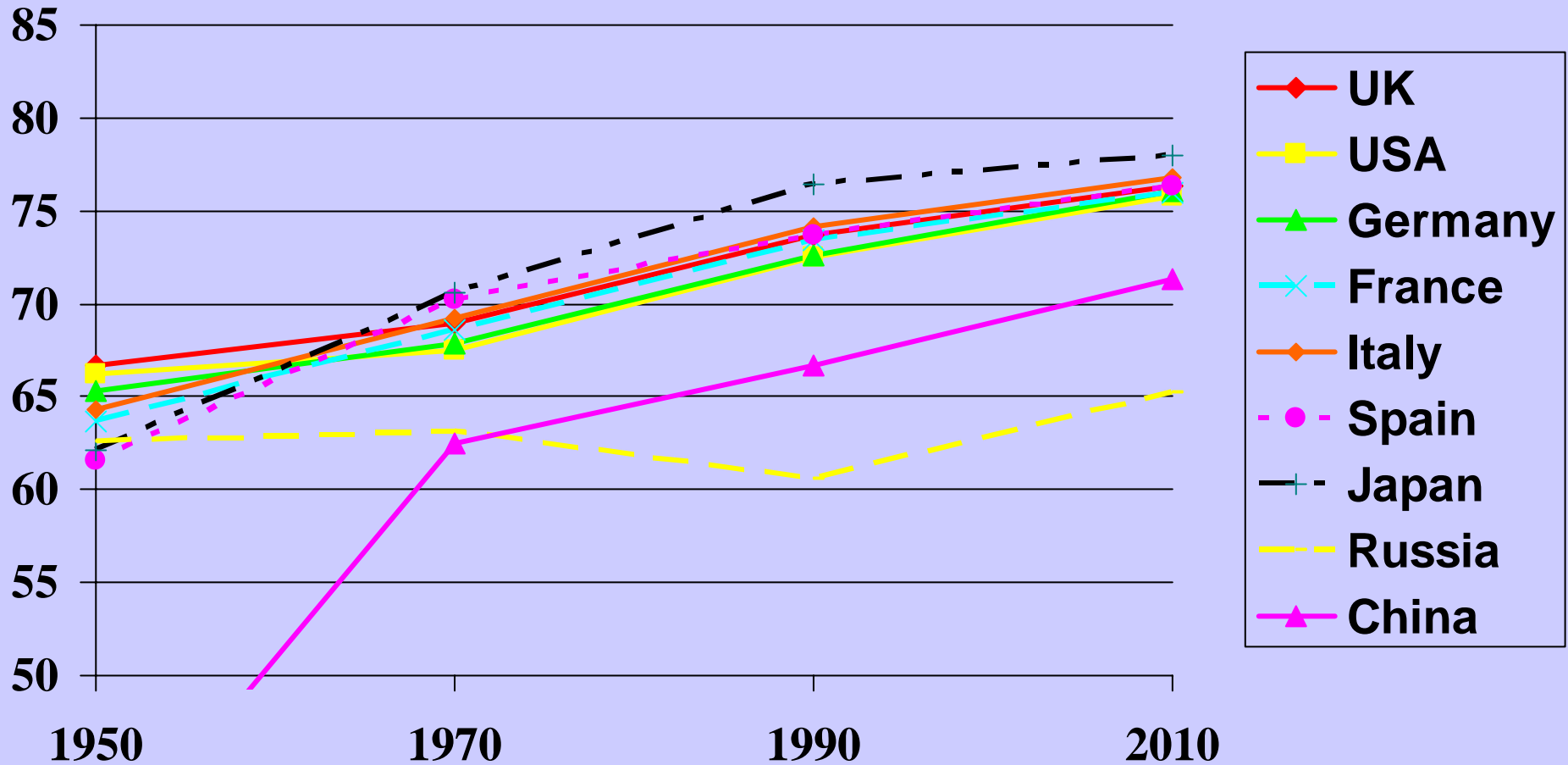
- demographic ageing
- maturing of pay-as-you-go schemes
- life expectancy at retirement rising
- economic conditions
- changing political fashion
- perceived lack of sufficient pre-funding
- security issues in private pensions

TOTAL PERIOD FERTILITY RATES, 总生育率, 1960-2010



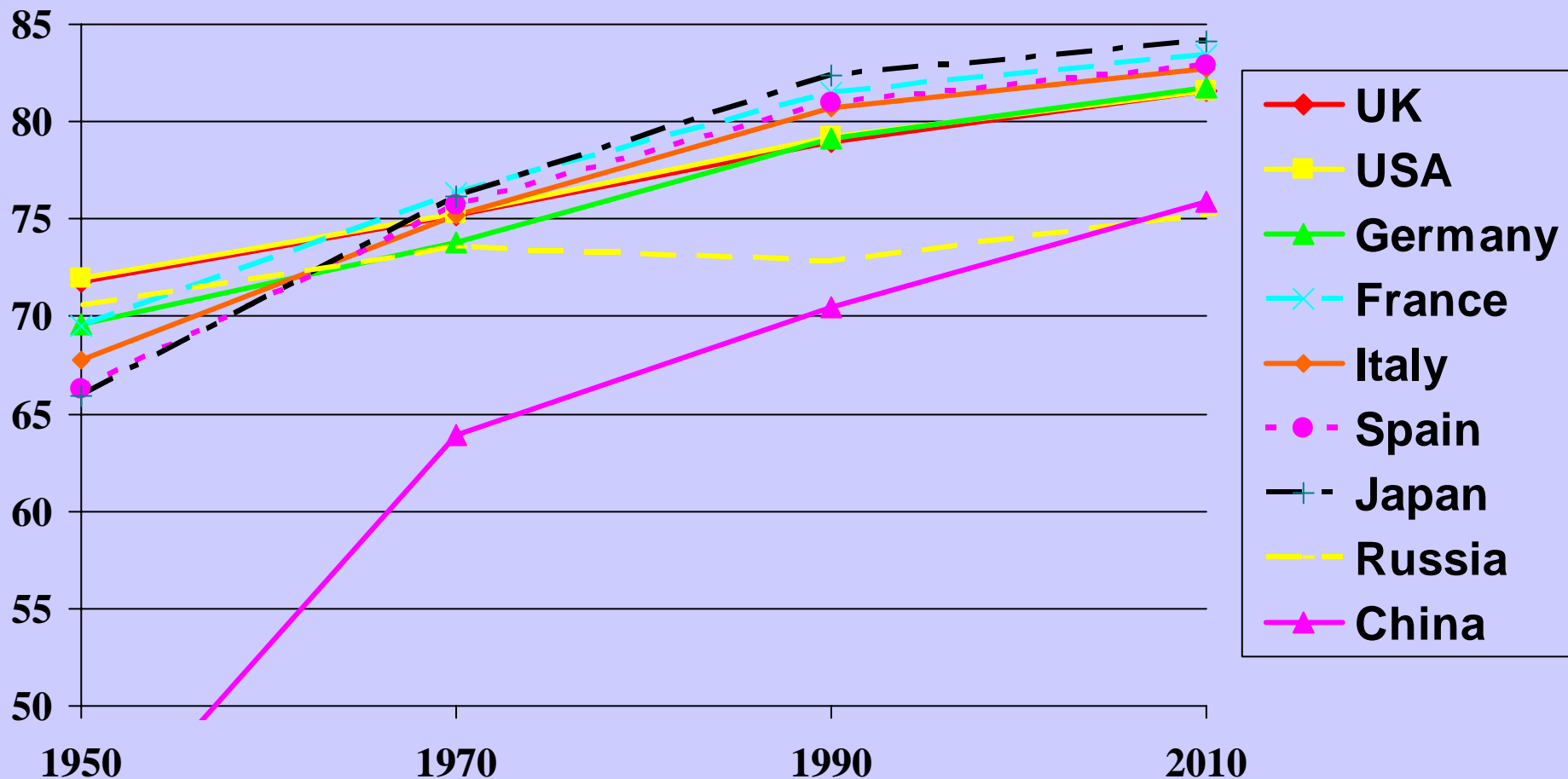
Expectation of Life for Males, 1950-2010

男性预期寿命，1950-2010



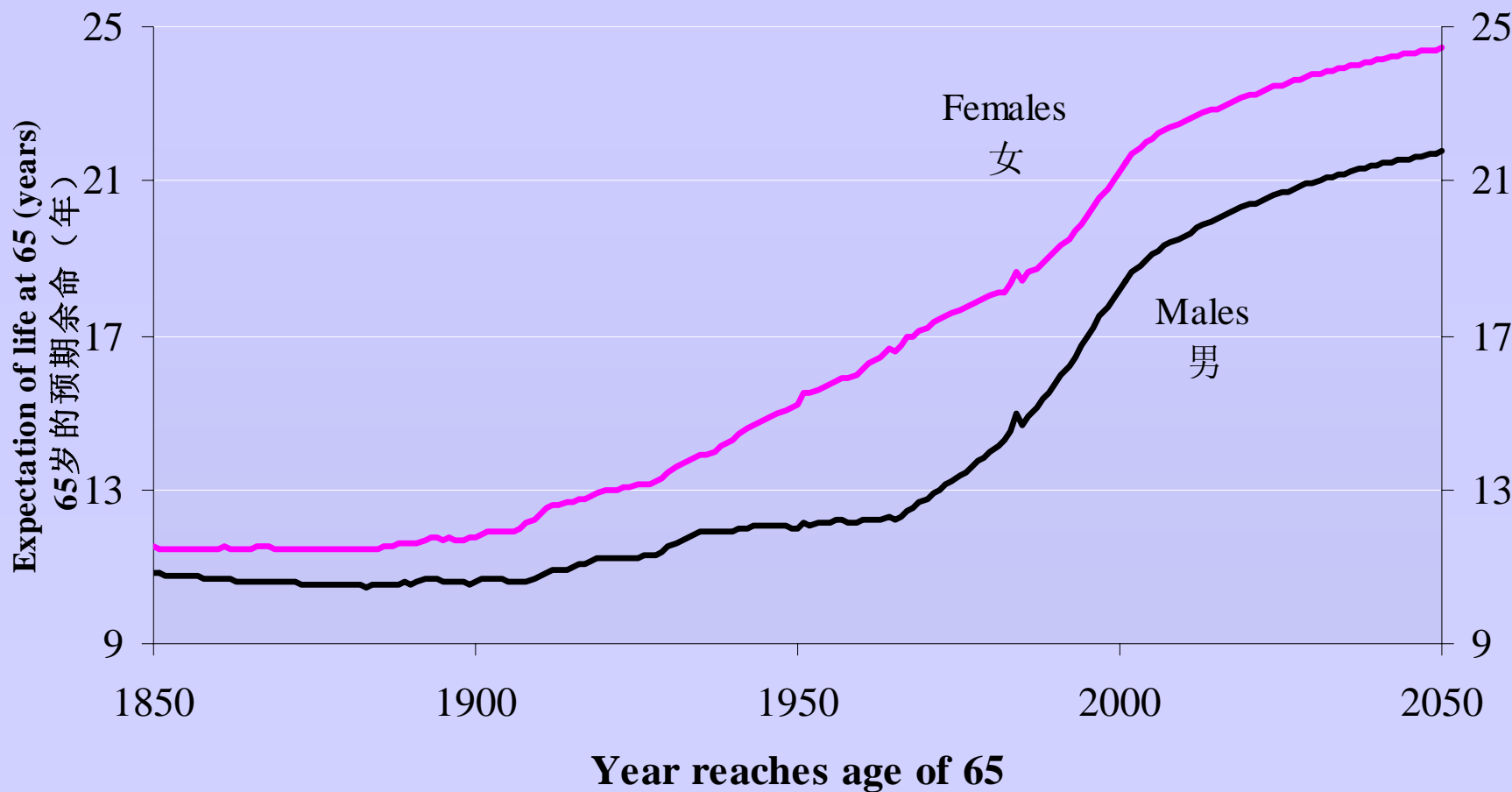
Expectation of Life for Females, 1950-2010

女性预期寿命，1950-2010



Expectation of life at 65 according to the mortality rates experienced or projected for cohorts, England & Wales

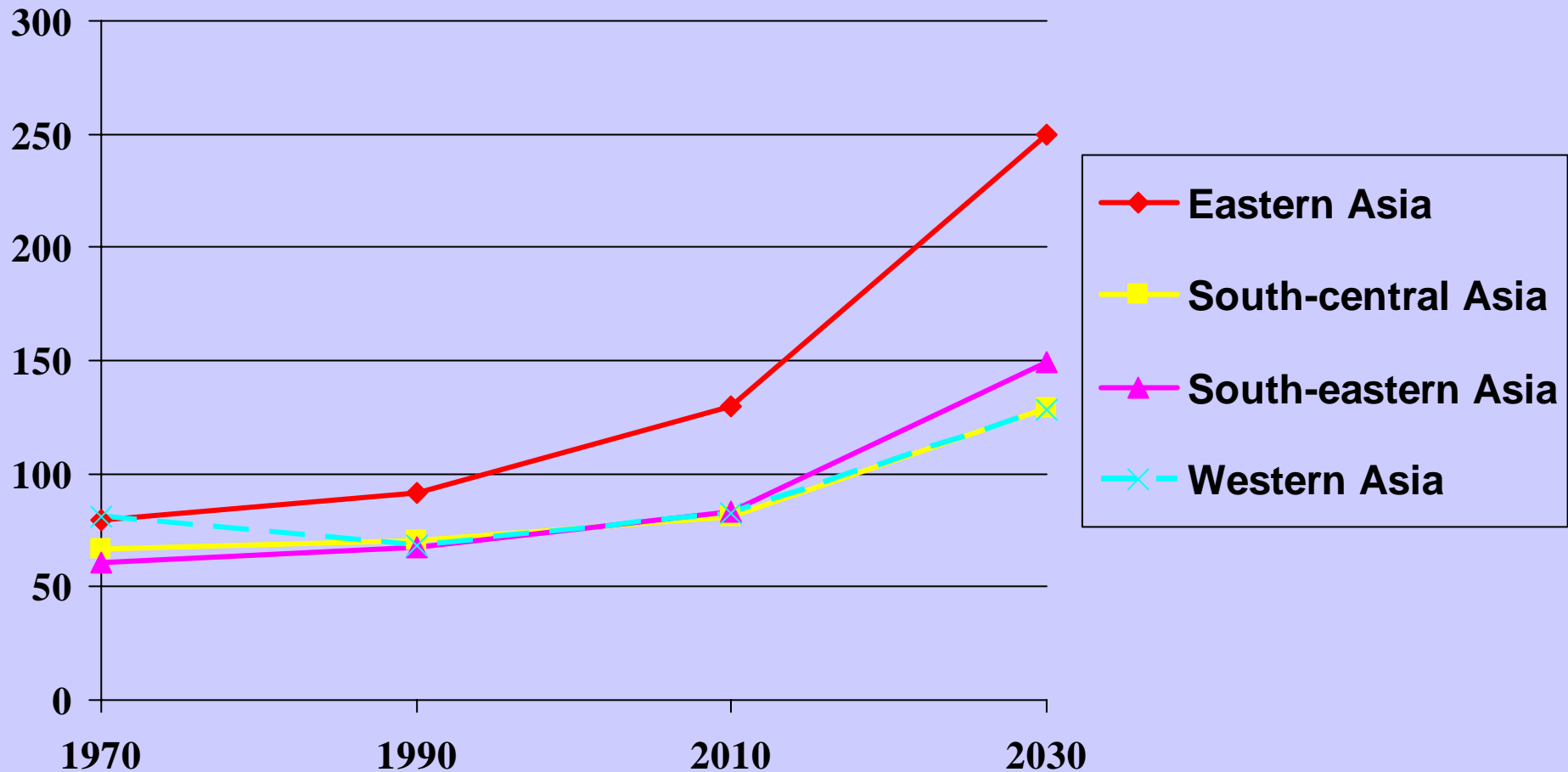
根据各人群既往或预测死亡率，65岁人口的预期余命



DEPENDENCY RATIOS, 1970-2030

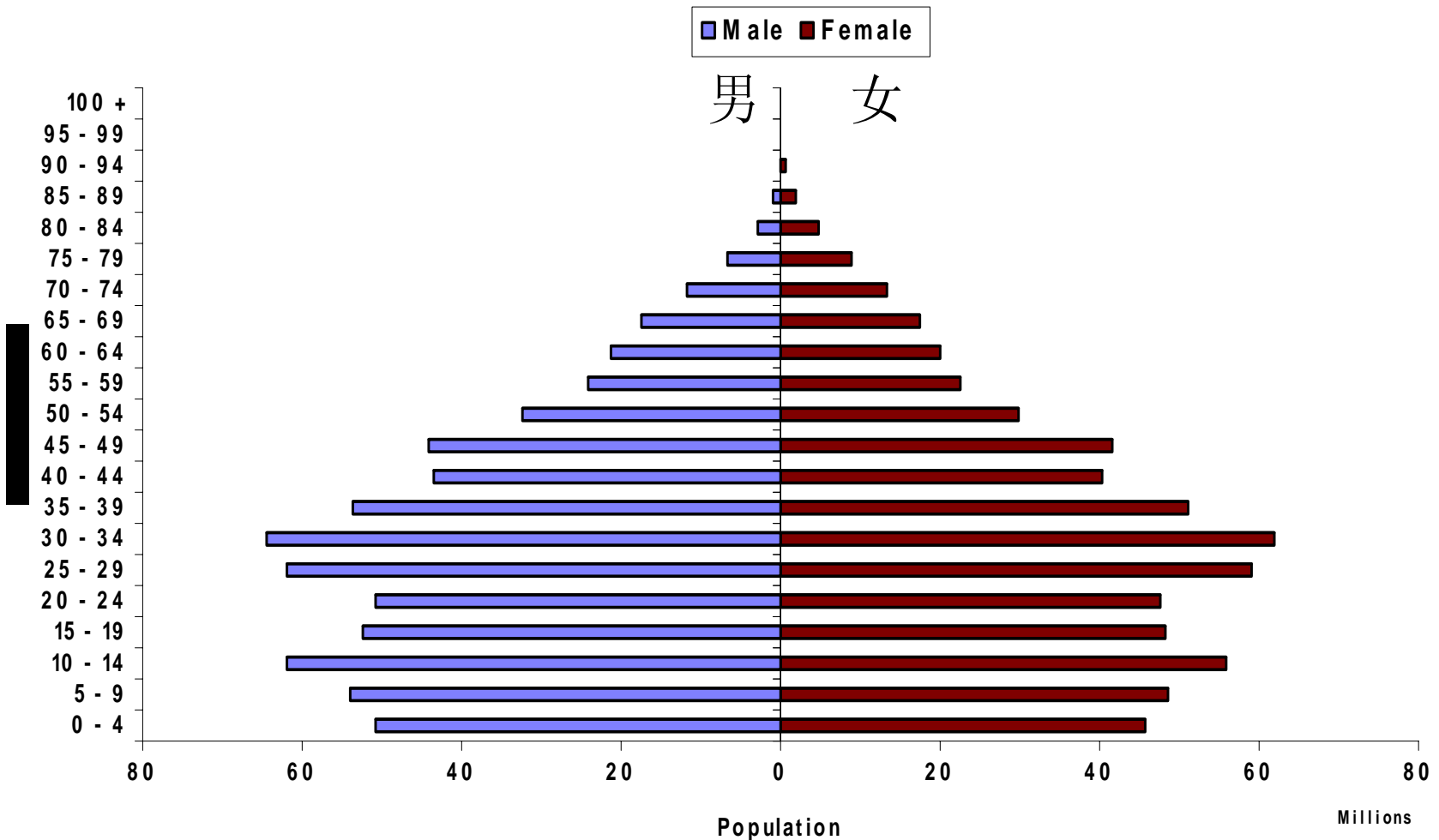
(nos. 65 & over per 1000 aged 15-64)

赡养率, 1970-2030 (65岁及以上人口/15-64岁人口千人)



Population pyramid for 2000

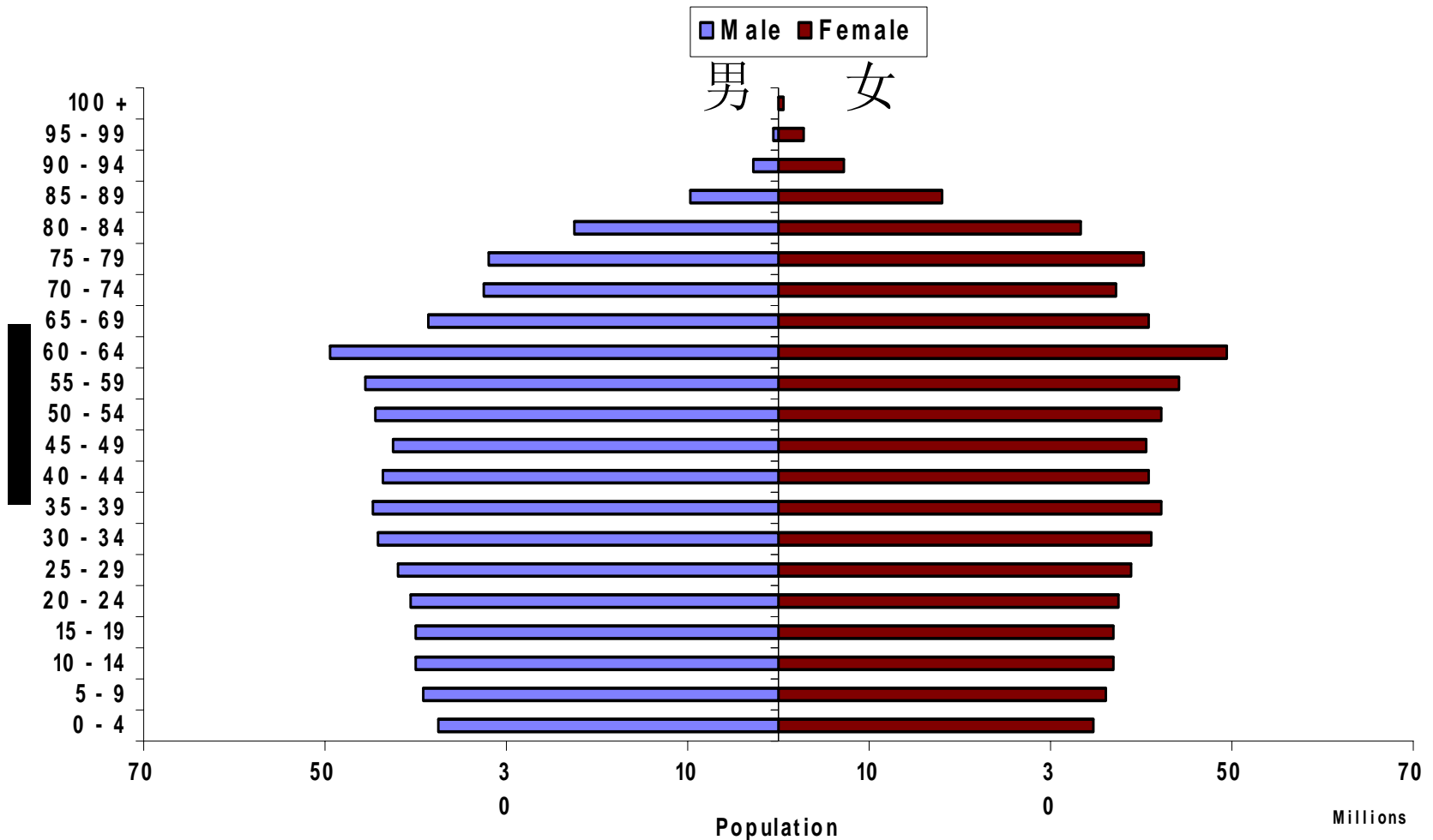
2000年人口金字塔



人口

Population pyramid for 2050

2050年的人口金字塔



人口

PENSION REFORM IMPERATIVES

- recognise impact of longevity
- make structure and financing sustainable
- reduce intergenerational dependency
- reduce perverse incentives in labour market
- improve retirement incentive structures
- increase coverage
- preempt large increases in public expenditure
- increase level of saving

PENSION REFORM TYPOLOGY

- contribution adjustment and reform
- benefit adjustment and reform
- structural reform
- reform of retirement age and structures
- new approaches to financing old schemes
- development of funded pensions

STRUCTURAL REFORM

- move to notional defined contributions
- introduce or increase flat-rate element
- make greater use of means-testing
- introduce element of pre-funding
- increase role of private pensions

NOTIONAL DEFINED CONTRIBUTION

- clear link between contributions and benefits
- still on a PAYG basis rather than funded
- different revaluation approaches
- possible demographic adjustment factor
- annuity conversion at pension age
- permits flexibility of retirement age
- passes on part of longevity risk

EXAMPLES OF NDC

- Sweden
- Italy
- Latvia
- Brazil
- PRChina (2nd pillar)
- France (régimes complémentaires)

WHY IS WORLD BANK SO KEEN ON NDC?

- DB is “flawed” – heterogeneous characteristics
- NDC creates better incentive structure
 - benefits linked directly to contributions
 - penalty for retiring early
 - good trade-off between work and leisure
- internalises adjustment to life expectancy
- can be made self-adjusting in other ways
- radical change easier to effect
- much harder to “game” than DB

SWEDEN

- notional defined contribution approach
- revalorisation of accounts by average wage
- automatic economic regulator
- annuity responds to improving mortality
- annual balance mechanism
- funded mini-pillar for 2½% of earnings (PPM)
- complementary industry-wide schemes
- fairly fast transition

NEW APPROACHES TO FINANCING

- shift some of the cost to general revenue
- introduce additional ear-marked taxes
- pre-fund part of the future liability
- make investment process independent
- introduce funded component

DEVELOPMENT OF FUNDED SCHEMES

- increased level of investment
- possible economic benefits
- introduces market disciplines.....
-and in some cases competition
- may improve efficiency
- makes pensions less political
- greater need for actuarial involvement

CHILE

- compulsory contributions to AFPs
- choice of private pension fund (AFP)
- minimum pension guaranteed by state
- underpin on annual return
- recognition bonds for previous rights
- old scheme closed to new entrants
- high levels of transaction costs

SINGAPORE

- Central Provident Fund (from 1953)
- defined contribution
- deposit account style
- high contributions (varying from time to time)
- medical expenses, education, investment
- lump sum benefit

HONG KONG

- Mandatory Provident Fund from 2000
- contributions of 10% of salary plus allowances
- earnings floor and ceiling
- private schemes and master trust schemes
- alternative of occupational retirement schemes
- 63% of employed population in MPF(31.3.02)

CHINA

- flat-rate basic pension (20% of average wage)
- NDC second pillar (11% contribution)
- pension is 1/120 of accumulated amount
- partially funded (at least in some provinces)
- fully funded voluntary third pillar
- Liaoning experiment
 - * basic pension at 30% of average wage
 - * fully funded DC from employee contns.
- further experiment in Helongjiang

US DEBATE

- OASDI out of actuarial balance over 75 years
- currently income exceeds expenditure
- substantial fund building up (in Treasuries)
- fund projected to run out in 2015
- President's proposal to allow contracting out
- ...with diversion into individual accounts
- huge potential transition cost
- doesn't address problem of imbalance...
- ...unless benefits are reduced in long term

ARGUMENTS IN FAVOUR OF FUNDING

- increases level of saving
- helps to develop capital markets
- provides needed investment capital
- helps to address ageing problems
- may reduce long-term cost

COUNTER-ARGUMENTS

- may substitute for other saving
- markets may not be able to cope
- may push up prices with excess demand
- ageing will still have an impact
- cost is only reduced in certain circumstances

CONCLUSIONS

- advantages of mix of systems
- private funds are not a panacea
- problems of coverage, risk and misselling
- good regulation is essential
- need to keep transaction costs down
- need for functioning capital markets
- ... and annuity markets
- ...and new retirement products

Actuarial Roles in Social Security Schemes

社会保障计划中精算的作用

- demographic projections 人口预测
- estimates of future benefit outgo 未来福利支出预测
- estimates of future contribution income 未来缴费收入预测
- long-term projections of financial balance 长期财务收支预测
- short/medium-term estimates of cash-flow 中短期现金流预测
- development of funding strategies 规划基金收支战略
- asset/liability management 资产/负债管理
- actuarial control cycle 精算控制程序环

Report on Long-term Financial Condition

长期财务状况报告

- estimates of future outgo on different benefits
未来各类福利计划的预测支出
- yield of contributions or hypothecated taxes
缴费或税收收入
- adequacy of contribution rates set in law, or....
法定缴费率是否适当，或...
- contribution rates necessary to achieve balance
收支平衡的缴费率
- costs relative to GDP or to total earnings
与GDP或总收入相关的成本
- impact of investment earnings on cash-flow
现金流投资收益影响
- projected size of funds 预计的基金规模

Status of actuarial work

精算工作

- information to support operations
- 提供支持系统运作需要的信息
- information to support policy-making
- 提供决策支持需要的信息
- independent financial audit and review
- 独立的财务审计和评估
- component of comprehensive internal reporting
- 综合全面的内部报告
- part of general government reporting system
- 是政府报告体系的一个部分
- public assurance of sustainability
- 保证可持续性

International Guidelines

国际指导方针

- International Social Security Association 国际社会保障协会
 - governance and investment guidelines
管理和投资原则方针
- “An actuary should be appointed... to carry out periodic actuarial reviews of the scheme. The actuary should be free from political interference.”
“应指定精算师.....定期对计划进行精算评估。精算师应不受政治因素干扰。”
- International Actuarial Association 国际精算协会
 - guidelines for social security actuaries
社会保障精算师指导方针

Why Actuaries?

为何需要精算师?

- actuaries “make financial sense of the future”
- mathematical modelling of future scenarios
- experts in demography...
- ...and in projecting financial consequences
- understanding of uncertainty and risk
- professional framework for reporting
- actuaries provide professional independence
- 精算师让“未来的发展在财务上具有可靠性”
- 对各种未来发展方案的数学建模
- 是人口学的专家.....
- 并是预测未来财务情况的专家
- 了解不确定性和风险
- 专业的报告体系
- 精算师提供中立没有其他因素干扰的专业意见

Role of Actuaries in Social Security Reform

社会保障改革中精算师的作用

- analysis of costs of existing arrangements
- advice on design of alternative structures
- modelling the transition
- regulation of complementary schemes
- modelling impact on individuals
- impact on public expenditure/borrowing
- modelling impact on investment markets
- 分析当前计划的成本
- 对其他的体系结构的设计提出意见
- 转型建模
- 补充计划的法规
- 建模模拟个人效应
- 对公共支出/债务的影响
- 建模模拟对投资市场的影响

Professional Independence

中立的专业意见

- pressures from government
 - pressures from operational units
 - frequently a desire to suppress information
 - disparate interests of different players
 - potential conflicts with other forecasts
 - actuary's right to determine scope of report
 - ...and to insist on content and assumptions
- 来自政府的压力
 - 来自业务部门的压力
 - 经常会控制信息
 - 不同利益方的不同利益
 - 有可能与其他预测发生冲突
 - 精算师有权决定报告的范围
 - 还可以决定内容和假设条件

Reporting Mechanism

报告机制

- actuary should take personal professional responsibility for the report...
- 精算师个人应对报告负有专业性负责
- ...including responsibility for assumptions
- 包括对假设条件负责
- should be clear to whom report is addressed
- 应明确向谁汇报
- signed report should be in public domain
- 应向公众开放报告并承担个人责任
- discuss recommendations and agree action
- 讨论意见并同意行动安排

Possible Structures

建议组织结构

- regular independent external actuarial review
- 定期进行独立的外部精算评估
- Government Actuary
- 政府精算师
- actuaries inside social security department
- 社会保障部门内部的精算师
- ad hoc external studies or reviews
- 类似的外部研究或评估

Role of Government Actuary in the United Kingdom

英国政府精算师的职责

- five-yearly reviews of National Insurance Fund
- 对国家保险基金每5年进行一次评估
- ...with 60 year projections
- 做60年的预测
- reports on annual uprating of benefits
- 每年报告福利待遇水平的更新情况
- financial consequences of new legislation
- 新立法带来的财务后果
- costings and estimates on ongoing basis
- 成本核算并按照即往情况预测

Role of Chief Actuary of OSFI in Canada

加拿大OSFI总精算师的职责

- situated within the Office of the Superintendent of Financial Institutions (equivalent of CIRC)
- 合署金融机构监管办公室（相当于保监会）
- statutory role for Canada Pension Plan (CPP)
- 负责加拿大养老金计划的法规制定（CPP）
- triennial published valuation of CPP
- 每三年公布CPP评估结果
- effective professional independence
- 完全独立的专业性服务

Role of Chief Actuary of SSA in United States of America

美国SSA总精算师的职责

- Office of Chief Actuary is within Social Security Administration
- 总精算师办公室设在社会保障管理部内
- actuary's report is published as part of the report of the Trustees of the social security program
- 精算报告作为社会保障计划参保人报告的组成部分一起对外公布
- includes a signed actuarial opinion
- 出具签名负责的精算意见
- effective independence of actuarial opinion...
- 完全独立的精算意见
- ...but Advisory Committee determines assumptions
- 咨询委员会决定假设条件
- dedicated actuarial resource for SSA
- 指定SSA的精算资源

Social Security Actuary

社会保障精算师

- demographic understanding
- 了解人口情况
- ability to project income and expenditure
- 可以预测收支
- economic and public policy impact
- 对经济和公共政策的影响
- investment policy and ALM
- 投资政策和ALM
- design of pension and social security structures
- 设计养老金和社会保障体系
- understanding of private insurance and pensions
- 了解个人保险和个人养老金