Lessons from economic theory and practical experience

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Part 1 Lessons from economic theory

Part 2 Challenges and solutions

Nicholas Barr, October 2017

Part 1 Lessons from economic theory

1 The simple model is not enough

2 Imperfect information and non-rational behaviour are pervasive

3 Annuities: Imperfect information also on the supply side

4 Funding is not an automatic solution to demographic change

5 Risk sharing is central (and often overlooked)

6 Different choices have different distributional implications

7 Sound principles of design but no single best pension system for all countries

The primary objective: Economic security in old age

Achieving that objective includes

- Consumption smoothing across a person's lifetime
- Insurance against income risks during working life and in old age
- Poverty relief

Lesson 1 The simple model is not enough

- The simple model (well-informed consumer, rational behaviour, etc.) is a useful benchmark but a bad basis for policy design
- What is needed is second-best analysis
  - Imperfect information (the economics of information, Nobel Prize 2001)
  - Non-rational behaviour (behavioural economics, Nobel Prize 2002, 2017)
  - Incomplete markets, incomplete contracts (Nobel Prize 2016; also cited in 2010 Nobel Prize)
  - Distortionary taxation (necessary to finance redistribution; addressed in the literature on optimal taxation, Nobel Prize 1996)

Lesson 2 Imperfect information and non-rational behaviour are pervasive

2.1 Lessons from the economics of information

Lessons from information economics

- In many areas of social policy the model of the well-informed consumer does not hold
- In the context of pensions
  - A survey, 50% of Americans did not know the difference between a stock and a bond
  - Most people do not understand the need to shift from equities to bonds as they age if they hold an individual account
  - Few people realise the significance of administrative charges for pensions

2.2 Non-rational behaviour: lessons from behavioural economics

- What conventional theory predicts
  - Voluntary saving to maximise lifetime utility (consumption smoothing)
  - Voluntary purchase of annuities (insurance)
- What actually happens
  - Bounded rationality
    - Procrastination: people delay saving
    - Inertia: people stay where they are; in theory it should make no difference whether the system is opt in or opt out – in practice, automatic enrolment leads to higher participation
    - Immobilisation: impossible to process information about 800 different funds (90% go into Swedish default fund)
  - Bounded will-power
    - People do not save, or do not save enough

Why? Recent lessons from behavioural economics

- Experimental evidence shows high discount rate in short run, much lower in long run
  - Next week's snack: 2/3 choose fruit salad, 1/3 chocolate
  - This week's snack: 1/3 fruit salad, 2/3 chocolate
- Thus people are rational for the future, but not the present; but when the future arrives it is the present, so the short-term wins

Clinical measurement of brain activity

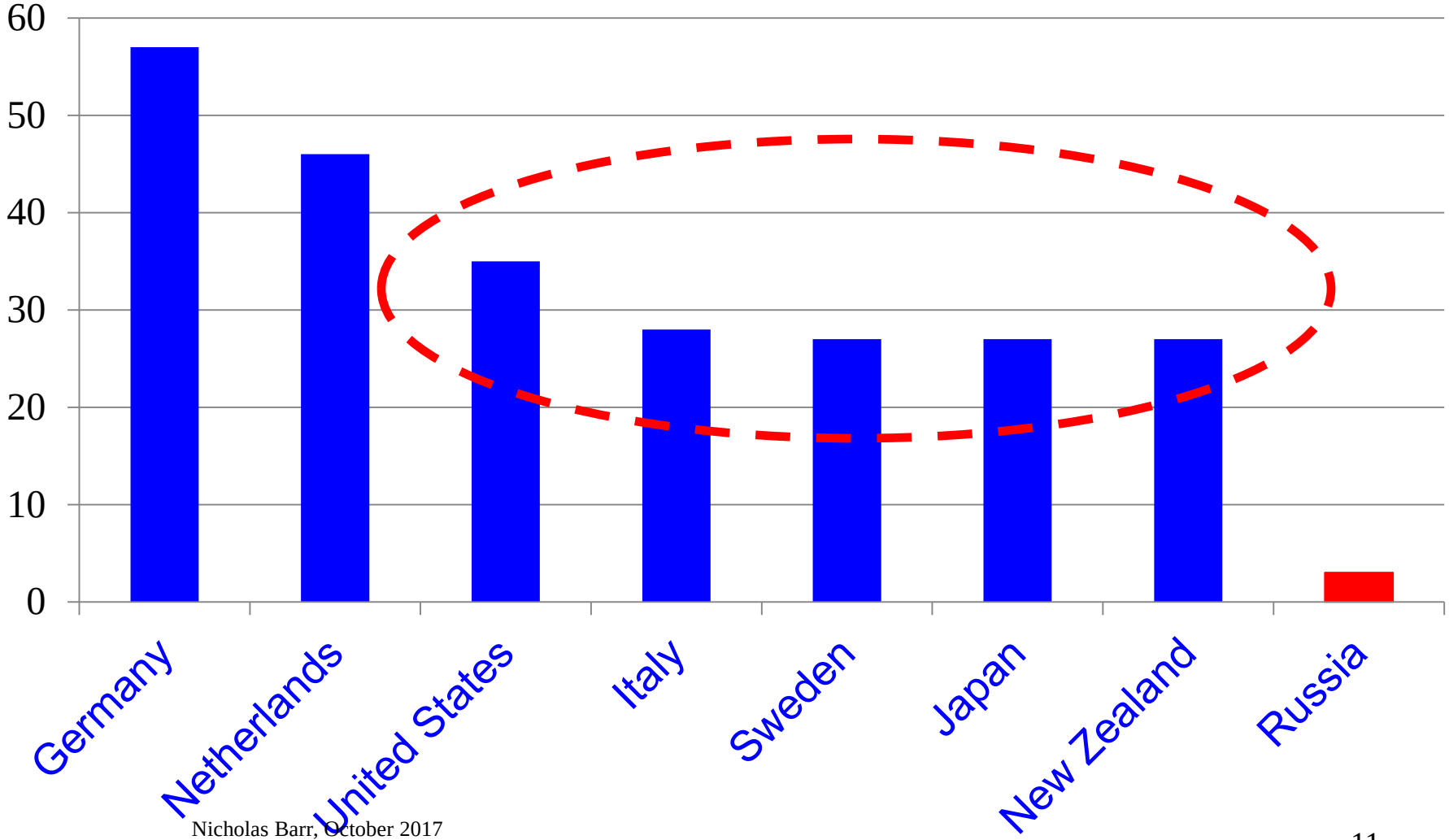
- Two parts of the brain
  - Mesolimbic: old part of brain: impatient – ‘eat now, won’t last’
  - Prefrontal cortex: newer part of brain: patient and rational – this is rational economic man and woman
- Clinical measurement (experiments while person is in scanner) shows that short-term decisions are made by the mesolimbic system, longer-term decisions by the prefrontal cortex
- Life is a constant fight between the two parts
- Examples: start dieting tomorrow; give up smoking tomorrow; but when tomorrow comes ...
- Results call into question the simple model of long-term rationality

2.3 Example Financial literacy is shockingly limited (Lusardi/Mitchell)

- You have $100 in bank account paying 2% interest/year. How much would you have after 5 years: less than $102? equal to $102? more than $102? don't know?
- Suppose interest rate on your bank account is 1% a year and inflation is 2% a year. After one year could you buy: more than today? same as today? less than today?
- True or false? Using $100 to buy shares in a single company usually provides a safer return than buying $100 in a wide range of shares)

Overview: % All Correct

Lusardi, Annamaria and Olivia S. Mitchell. 2014. "The Economic Importance of Financial Literacy: Theory and Evidence." *Journal of Economic Literature*. 52(1): 5-44.



And it gets worse

- Not only people who can’t (previous two slides), but also
- People who can but don’t: behaviour by financially knowledgeable person given time/energy/attention constraints

2.4 Implications for policy design

Implication 1: Constrained choice is part of good policy design

- Problems
  - Bounded rationality (e.g. not understand present values)
  - Bounded will power
  - Choice architecture is costly
- In the face of those problems, too much choice can *reduce* welfare
- Policy directions
  - Constrained choice about how much to save, i.e. savings mandate
  - Constrained choice of pension provider, i.e. limited menu of options

Implication 2: Don’t overstate what financial education is capable of achieving

- Financial education is useful and important, but there are limits to what it can realistically be expected to achieve
- Financial education does not make us well-informed choosers of complex financial products
- Even for a well-informed person, there are high transactions costs comparing complex options

Implication 3: Don’t overstate the usefulness of choice and competition

- Pensions are complex
- Systems in which workers have to choose from competing private pension providers face information and behavioural problems and have high administrative costs
- Not a condescending attitude; we do not allow people free choice of pharmaceutical drugs; pensions are similar
- Thus the model of choice and competition is the wrong one – it uses a first-best model in second-best circumstances
- The criticism is not of pension funds but of the model. Even the most knowledgeable, best-intentioned person could not run a pension fund cheaply using this model

Implication 4: Incentives matter – but not as much as people think

- Gruber and Wise (2004) show that badly-designed incentives for delayed retirement lead to a spike in the number of retirements
- But don't exaggerate: US 401(k) plans
  - Many employers make matching contributions
  - From age 59½ workers can make penalty-free withdrawals
  - Thus a worker can put money into a 401(k) plan, receive the employer match, and withdraw the money shortly afterwards – a high, risk-free return over a short period
  - Simple theory predicts that the option would be heavily used
  - That is not what happens

Lesson 3 Annuities: Imperfect information also on the supply side

- Risk and uncertainty
- Two uncertainties
  - Remaining life expectancy at retirement is more of an uncertainty than a risk
  - Inflation in retirement
- Potential role of government in completing the annuities market
  - Longevity bonds
  - Inflation-indexed bonds
  - Thus the private sector takes on the risk, the taxpayer the uncertainty – a sensible division of labour
  - An alternative approach: government-provided annuities (Sweden)

Lesson 4 Funding is not an automatic solution to demographic change

The macroeconomics of pensions

- Two and only two ways of organising pensions
  - Store current production
  - Build a claim to future production
- Pensioners are not interested in money, but in consumption (food, clothing, medical services). Thus the key variable is future output
- Pensioners can consume only what workers produce but do not themselves consume
- PAYG and funding are merely different financial mechanisms for organising claims on future output
- Thus the difference between the two approaches should not be exaggerated
- Key message: what matters is output

Static output: effects of demographic change on funded pensions

- Money accumulation: desired pensioner consumption exceeds desired saving by workers. Excess demand in the goods market causes price inflation, reducing the purchasing power of annuities.
- Financial asset accumulation: desired asset sales by pensioners exceeds desired purchases of assets by workers. Excess supply in the assets market reduces asset prices, reducing pension accumulations and hence the value of the resulting annuity.
- Under either outcome, pensioners do not get the real pension they expect

Growing output: effects of demographic change on funded pensions

- Money accumulation: a decline in the savings rate increases aggregate demand. But if supply has increased in parallel, there is no effect on prices. Thus period 2 pensioners get the real pension they expect.

- Asset accumulation: wages generally keep pace with output. If workers' pension target is (say) 50% of their earnings, rising wages imply rising demand for assets, hence no effect on asset prices. Again, period 2 pensioners get the real pension they expect.

Sources of output growth

- Increasing the productivity of each worker, through
  - (1) More and better capital equipment
  - (2) More and better human capital
- Increasing the number of workers from each age cohort
  - (3) Higher labour force participation
  - (4) A later age of retirement
  - (5) Importing labour directly (immigration)
  - (6) Importing labour indirectly (export capital)

Conclusion: funding and demographics

- In the face of demographic problems the key variable is output
- Funding is helpful only if it increases output
- Policy should consider the entire menu of policies which promote output growth

Lesson 5 Risk sharing is central (and often overlooked)

- A central question: How should risks be shared?
- Different designs share risks differently
  - In a pure DC plan, the risk of varying returns to a pension accumulation falls on the individual worker
  - In a pure DB plan, the risk of varying returns falls on the plan sponsor, e.g. in a firm or industry plan on workers, shareholders and/or customers
  - In a pure public PAYG DB plan, the risk of rising pension costs falls on current workers
  - In a plan which includes at least some tax finance, risk falls on taxpayers and hence, via government borrowing, can be shared with current, past and future taxpayers

Exposure to risk should decline with age

- The capacity to adjust declines with age
  - Workers can adjust to a shock by (a) saving more, (b) retiring later and/or (c) retiring on a smaller pension
  - Older workers have less time to adjust than younger ones
  - Pensioners have less time to adjust than workers, and fewer margins on which to adjust
- Thus pension systems should offer risk-protection that rises with age, particularly for pensioners and workers near retirement
- Not mean that pensioners should face no risk – but should face less risk than younger people

Risk sharing at a system level

- A pension system can share risk in different ways
- In the US social security system workers with lower earnings get more pension per dollar of contribution than workers with higher earnings
- Risks can be shared by the design of different elements in the system: risk sharing is wider in New Zealand (generous social pension, smaller funded individual accounts) than in a system where funded DC accounts are a larger part of the system

Lesson 6 Different choices have different distributional implications

- Introducing a new PAYG system makes a transfer to the first cohort of retirees; if policy makers introduce a funded scheme, the first cohort receives no pension
- Similarly, a move towards funding that increases saving redistributes from today's workers and pensioners to later generations
- Thus
  - Choices about pension systems are inherently and inescapably also choices about intergenerational redistribution
  - Such redistribution may or may not be good policy
  - But ignoring distributional effects is faulty analysis; so are claims of Pareto superiority

Lesson 7 Sound principles of design but no single best pension system for all countries

- Objectives: consumption smoothing, insurance, poverty relief, redistribution
- Constraints include
    - Fiscal capacity
    - Institutional capacity
    - Empirical value of behavioural parameters
    - Shape of the income distribution
- No single best system because
    - Policy makers attach different relative weights to the different objectives
    - The pattern of fiscal and institutional constraints differs across countries
- Thus
    - What is optimal will differ across countries and over time
    - Pension systems look different across countries; this is as it should be

Part 2 Challenges and solutions

1 More fluid labour-market relations

2 Demographic change

3 Addressing risk and uncertainty

4 Conclusion

1 More fluid labour-market relations

1.1 The problem

- In 1950 full time long-term employment was the norm
- Today greater diversity
  - Different relations
    - Employed, self-employed or outside the paid labour force
    - Full-time, part time or flexible (e.g. zero hour contracts, gig economy)
    - Long-term or short-term
    - Formal or informal
  - More movement across these relations
    - More dynamic labour markets
    - Need for more, and more frequent, training because knowledge goes out of date more quickly
- Thus contributory benefits tied to employment face problems of coverage

Example: UK 2005

- In 2005 a full basic state pension needed over 40 years of contributions
- In 2005
  - About 85 per cent of male retirees were entitled to a full basic pension
  - The comparable figure for women was 30 per cent
- Cause: not faulty administration but a poor fit between today's labour markets and full contribution records

1.2 Policy direction: Non-contributory pensions (aka social pensions)

- A flat-rate tax-financed pension based on age and residence

Advantages: The view from the Ministry of Social Security

- Strengthen poverty relief in terms of coverage, adequacy and gender balance
- Share risk with taxpayers and hence via government borrowing intergenerationally
- Can fit different budget envelopes
- Make fewer demands on institutional capacity than contributory systems

The view from the Ministry of Finance

- Can fit different budget envelopes
  - Level of monthly benefit
  - Age at which benefit starts
  - Whether or not there is an affluence test

Country examples

- Australia (with affluence test)
- Canada (with affluence test for top 5%)
- Chile (with affluence test for top 40%)
- Netherlands (stringent residence test)
- New Zealand (no affluence test, easy residence requirement)
- Developing countries

2 Demographic change

- Two drivers
  - Longer life expectancy
  - Lower fertility

2.1 Longer lives

- The problem: people are retiring too soon
  - Longer healthy life + constant retirement age creates problems of pension finance
  - The problem is *not* living too long, but retiring too soon
- Policy directions
  - Earliest pension age should rise in a rational way as life expectancy increases
  - Later and more flexible retirement
- Beware the ‘lump of labour’ fallacy

Key message: not only later retirement; also more flexible retirement

- Mandatory full retirement made sense given the historic purpose of pensions, but ‘cliff edge’ retirement a bad fit to today’s world
- Increased choice about when to retire, and whether fully or partially is desirable
  - As a response to demographic change
  - As a response to individual preferences (and thus desirable for its own sake, irrespective of problems of pension finance)

2.2 Lower fertility

- The problem: declining birth rates in many countries
- Policy direction: more saving
  - Declining fertility will lead to a smaller workforce
  - A rational response is to make each individual member of the smaller workforce more productive through increased investment in human and physical capital
- To that end, higher saving is important

Key message: Many ways to organise saving

- Funded individual accounts are one way to organise saving, but not the only way
- Within the pension system options include
  - Fully-funded individual accounts from multiple competing providers (Chile, Australia)
  - Simpler, cheaper individual accounts with less choice (US Thrift Savings Plan, UK NEST pensions – more below)
  - Fully-funded industry plans (Netherlands)
  - Partially-funded national NDC (Sweden – more below)
  - Partially-funded national DB (Canada)
  - Partially-funded DB with risk sharing (New Brunswick)
- Outside pension system: Norway sovereign wealth fund

Example 1: Simple savings and annuities

- The usefulness of choice and competition should not be overstated because
  - Choice has high administrative costs
  - Consumers may not do a good job of choosing because of
    - Imperfect information
    - Bounded-rationality
    - Bounded-will power

Implications for pension design

1. Make pensions mandatory or use automatic enrolment
2. Keep choices simple: highly constrained choice is a deliberate and welfare-enhancing design feature
3. Include a good default option which includes life-cycle profiling if the system requires annuitisation
4. Keep administrative costs low by decoupling account administration from fund management
   - Centralised account administration
   - Fund management
     - Wholesale, competitive; or
     - Sovereign wealth fund; closest example is Norway

Country examples: USA, UK, New Zealand

- The US Thrift Savings Plan (www.tsp.gov)
  - Auto-enrolment plan for federal civil servants
  - Workers choose from five funds
  - Centralised account administration
  - Wholesale fund management
- UK National Employment Savings Trust (NEST) (www.nestpensions.org.uk); similar design to TSP for similar reasons
- New Zealand: Kiwisaver (http://www.kiwisaver.govt.nz/)

Barr and Diamond (2017) recommendations to Australia inquiry

- Principles
  - The system should work well for a worker who makes no choice
  - It should be socially acceptable to make no choice
- Accumulation
  - A single default
  - A simple choice architecture within the default
  - One account per person
  - A single clearing house
  - A single record keeper
  - A level playing field for competition between the government-run default and private providers
- Drawdown
  - Information on drawdown
    - Curated drawdown
    - A deferred annuity component
  - Information on annuities
  - A default portfolio
  - Survivors' pensions

Example 2: Notional defined-contribution (NDC) pensions

- Any system with fully-funded accounts can share risk only among current participants; a partially-funded system can share risk more widely
- The system in Sweden is an interesting example of a different way of organising individual accounts
- The central element is a notional defined-contribution (NDC) pension
- I was asked by the Swedish authorities to assess the system: Barr (2013)

NDC pensions

- Mimic individual funded accounts, but on a Pay-As-You-Go or partially-funded basis
- Workers' contributions this year mostly pay this year's pensions
- The government keeps a record of individual contributions, each year attributing a notional interest rate to each worker's accumulation
- Notional interest rate can be w or wL or GDP growth
- When the worker retires, his/her notional accumulation is converted into an annuity based on the remaining life expectancy of his/her birth cohort

Formal characteristics of NDC

- An accounting mechanism that credits all lifetime earnings
- A mechanism linking a worker's final balance with the demographic and macroeconomic environment
- A quasi-actuarial rule converting the final balance into an annuity
- Claims on future benefits are not based on real capital but on promises from a government-related entity

Potential advantages of NDC

- Simpler for worker than system with a lot of choice
- Centrally administered, hence low administrative costs
- Shares risk more widely than individual accounts
- Does not require the institutional capacity to manage multiple funded schemes
- Increased saving may be the wrong policy (China saving over 50% of GDP), or people may not want to save in the pension system
- Compatible with a greater or smaller degree of funding which can change over time

Country examples: Sweden, Norway, Poland, Latvia

- Sweden the first to implement NDC fully
  - NDC with notional interest rate = growth of average wage
  - Buffer fund, i.e. partially funded
  - Benefit based on size of accumulation plus remaining life expectancy of birth cohort
  - ‘Brake’ mechanism reduces accrual rate and indexation of benefits in payment in face of a projected deficit
- The good news
  - Proved robust in face of economic crisis
  - Spreads risk more widely than fully-funded DC
  - Includes options for partial drawdown of benefits

3 Addressing risk and uncertainty

- Risk sharing generally raises welfare
- Corner solutions are generally sub-optimal
  - DC individual accounts: all risk on workers
  - Final salary plans: all risk on plan sponsors
- As discussed in previous session
    - Can share risk at system level
    - Exposure to risk should decline with age

Looking ahead

- The right question: How should risks be shared?
- Early examples of risk-sharing approaches
  - Netherlands: career-average defined-benefits but contingent on the financial health of the plan, hence contingent on fund performance and demographic developments
  - The New Brunswick plan (more below), with similar plans under discussion elsewhere in Canada
  - Trade union proposal for risk sharing in UK Royal Mail pension plan

Target benefits: the New Brunswick plan

- Agreed between employers, trade unions and provincial government
- The plan has three central elements
  - A division of benefits into base benefits and ancillary benefits
  - Risk management through a stress test that assesses the financial health of the plan
  - Rules that set out pre-determined actions in the face of a projected deficit, including
    - Higher contributions, split between workers and employers
    - Lower accrual rates
    - Under-indexing benefits in payment
    - A catch-up provision if later financial improvements allow

4 Conclusion

Lessons for pension design

- As economic and institutional capacity increases, the range of feasible options widens
- But more complex is not necessarily better; New Zealand has a simple system out of choice, not constraint

What really matters?

- Only two things *really* matter
  - **Output growth**
    - PAYG and funding are merely different financial mechanisms for organising claims on future output
    - Thus arguments about pension reform should focus on output
  - **Effective government**
    - **N**ecessary for *all* types of pension
    - Key element: capacity to take a long-run view
- These elements are core however pensions are organised

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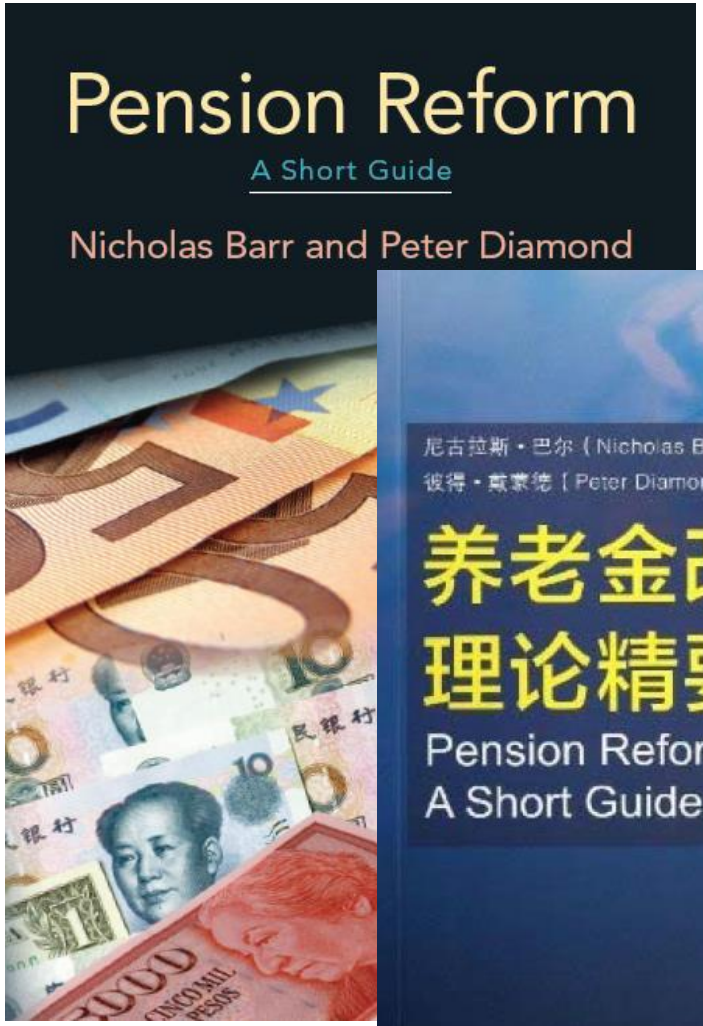
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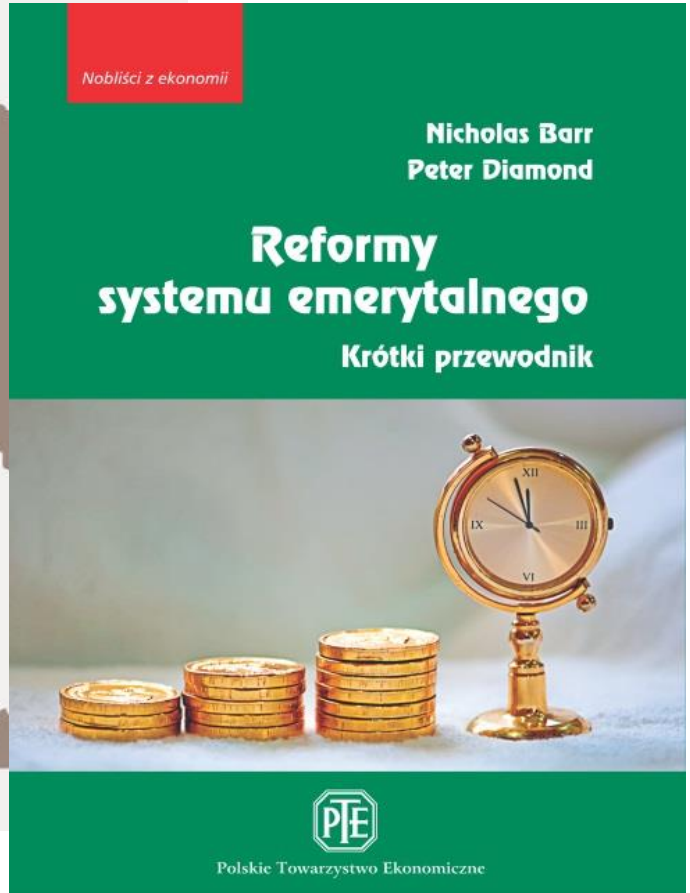
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