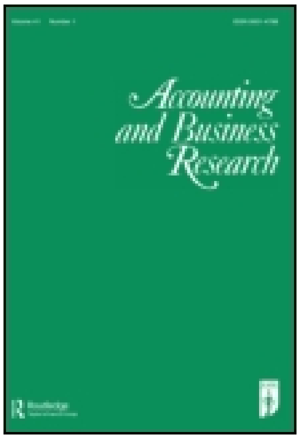

Accounting and Business Research
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rabr20

International trends in pension provision

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Published online: 04 Jan 2011.

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Abstract—This paper considers international trends in pension arrangements, starting with lessons from economic theory. The analysis includes recent developments in the economics of information and behavioural economics, developments which call into question conventional arguments in favour of voluntarism and free competition. Section 3 of the paper considers why pension systems are developing the way they are – largely a response to a series of long-term trends. In light of the discussion in Sections 2 and 3, Section 4 of the paper describes pension systems in a range of countries, and illustrates the wide range of options available to a developed country. Section 5 reflects briefly on accounting standards.

The paper offers a number of key messages. Pension systems have multiple objectives. Second, and, in part, a consequence, there is no single best pension system. Third, policy design is not enough – the design of pension systems must be compatible with a country's capacity to implement the design effectively.

Keywords: behavioural economics; funded pensions; PAYG pensions; pension finance; pension reform

1. Introduction

A survey of pension systems internationally risks becoming a long narrative that leaves the reader unclear about why the paper was worth reading. To avoid that fate, I shall start with the 'So what?' question – why is an international survey useful? For the purposes of this conference I take the answer to be:

- that accounting standards have important effects on the position of firms and, as a consequence, on the welfare of workers and pensioners;
- that with increasing labour mobility, accounting standards need to apply internationally and, in order to do so, need to be applicable to the wide range of pension systems that exist across countries;
- that revision of accounting standards needs to be forward looking, so that the survey should focus less on a static snapshot of current systems than on directions of change.[1]

As backdrop, it is important to understand why the wide range of different systems is largely an appropriate outcome, not a malign accident. Thus the second part of the paper sets out lessons from economic theory. The third part looks at directions of change and discusses why pension systems are changing in those directions. The fourth part discusses outcomes, looking at a selection of systems in different countries. The paper concludes with an epilogue on accounting, though I am not an accounting expert, so discussion is brief.

2. Lessons from economic theory

This section suggests some conclusions from economic theory: pension systems have multiple objectives; what matters is output; imperfect consumer information and decision-making are pervasive; and pension schemes face large risks. The section concludes with an important adjunct to the theoretical discussion – the argument that implementation matters.

2.1. Pension systems have multiple objectives

From an individual viewpoint, income security in old age requires two types of instruments: a mechanism for consumption smoothing, and a means of insurance.

Consumption smoothing

People are not interested in income per se, but in the consumption of goods and services – food, clothing, bus rides, medical care, tickets to football games, etc. People seek to maximise their well-being not at a single point in time, but over time. Someone who saves does so not because extra consumption today has no value, but because he values extra consumption in the future more highly. Most people hope to live long enough to be able to retire, so a central purpose of retirement pensions is consumption smoothing, whereby people seek to transfer consumption from their productive middle years to their retired years.[2]

Insurance

In a world of certainty, individuals save during working life to finance their retirement. However,

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This paper draws heavily on Barr and Diamond (forthcoming). For a summary of the underpinning economic theory, see Barr and Diamond (2006, 2009).

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[1] This paper is about the economics of pensions, not about accounting aspects. The latter are addressed in the other papers presented at this conference, viz. Glaum (2009), Kiosse and Peasnell (2009), Landsman (2009) and Napier (2009).

[2] This process is explained more formally by the simple Fisher model. See, for example, Barr (2001, ch. 2).

people generally do not know how long they are going to live. Thus a pension based on individual savings faces the risk that the person will outlive those savings. Though any one person does not know how long he is going to live, the life expectancy of a large group is better known. Thus members of a group could agree to pool their pension savings, with each person drawing a pension based on: (a) the group's life expectancy; and (b) the total amount he or she had contributed to the pool. This is the essence of annuities, whereby an individual exchanges his pension accumulation at retirement for regular payments for the rest of his or her life, thus allowing people to insure against the risk of outliving their pension savings.

Alongside these individual objectives, public policy generally has additional goals.

Poverty relief

Poverty relief targets resources on people who are poor on a lifetime basis, and thus unable to save enough. As a practical matter, poverty relief also has to address transient poverty.

Redistribution

Pension systems can redistribute on a lifetime basis, for example, by paying pensions to low earners that are a higher percentage of their previous earnings (i.e. a higher replacement rate), thus subsidising the consumption smoothing of lower earners. Since life-long earnings are uncertain from the perspective of an individual, such a system provides some insurance against low earnings. There can also be redistribution towards families, for example, paying a higher pension to a married couple than to a single person, even though both families have paid the same contributions. Pension systems can also redistribute across generations, for example, if a government reduces the contribution rate of the present generation, thereby requiring future generations to pay higher contributions or have lower pensions.

Alongside these primary objectives, pensions policy may have secondary goals, including economic growth. There is debate about the relative weights accorded to old age security and to secondary objectives.

Implications

To address multiple objectives, well-designed pensions need to have multiple components. Sound analysis should consider the pension system as a whole, rather than focus unduly on one component, ignoring the others. The term 'pension system' therefore recurs throughout the paper.

2.2. The macroeconomics of pensions: what matters is output

There are two (and only two) ways of seeking security in old age. One is to store current production for future use. With the exception of housing, this approach is inadequate for most consumption needs: it is expensive; it does not address uncertainty (e.g. about how a person's tastes might change); and it cannot be applied to services deriving from human capital, notably medical services.

The second approach is for individuals to exchange production when younger for a claim on future production when older. There are two broad ways to do so: (1) by saving part of his wages, a worker could build up a pile of *assets* which he would exchange for goods produced by younger people after his retirement; or (2) he could obtain a *promise* – from his children, his employer, or government – that he would be given goods produced by younger workers after his retirement. The two main ways of organising pensions broadly parallel these two types of claim. Funded schemes are based on accumulations of financial assets, Pay-As-You-Go (PAYG) schemes on promises (see definitions in Box 1).

The purpose of pensions is to allow people to continue to consume after they have stopped working. As noted earlier, pensioners are not interested in money per se, but in consumption. Thus future output is central. PAYG and funding are simply financial mechanisms for organising claims on that future output. In macroeconomic terms, though there are differences between the two approaches, those differences should not be exaggerated.

The centrality of output remains true in an open economy. In principle, pensioners are not constrained to consumption of domestically-produced goods, but can consume goods made abroad so long as they can organise a claim on those goods. If British workers use some of their savings to buy Australian factories, they can, in retirement, sell their share of the factory's output for Australian money to buy Australian goods, which they then import to the UK. This approach, though useful, is no panacea. The policy breaks down if Australian workers all retire; thus the age structure of the population in the destination of foreign investment matters. Second, if large numbers of British pensioners exchange Australian dollars for other currencies, the Australian exchange rate might fall, reducing the real value of the pension. Thus the ideal country in which to invest has a young population *and* products one wants to buy *and* political and financial stability *and* is large enough to absorb the savings of other countries with ageing populations. Countries with ageing populations include all of the OECD, and many others, China being a notable example.

Implications

Overlooking the importance of output leads to errors. Though the point was shown to be flawed

Box 1
Terminology

- *Defined-benefit pensions*. In this arrangement a person's pension is based on his or her wage history and commonly on length of service. Thus, a pure arrangement adjusts funds to meet anticipated obligations, so the risk of varying rates of return to pension assets falls on the organiser, i.e. the employer or the government.
- *Defined-contribution pensions*. In this case a person's pension is determined only by the amount of assets accumulated toward his or her pension. Thus, a pure scheme adjusts obligations to match available funds, and so the risk of varying rates of return to pension assets falls on the individual.
- *Funded pensions* are paid from an accumulated fund built up over a period of years out of contributions by or on behalf of its members.
- *Notional defined-contribution (NDC) pensions*. At root, NDC pensions have two elements: they are organised on a PAYG basis; but they mimic funded individual accounts in that a person's pension is strictly related to his or her lifetime pension contributions. Pensions may be adjusted for the cohort's life expectancy, and credits may be offered for periods spent caring for children.
- *Pay-as-you-go (PAYG) pensions* are paid out of current revenue (usually by the state, from tax revenue) rather than out of an accumulated fund.

many years ago,[3] such a widespread error is the argument that funding necessarily assists pension finance.

Suppose that a large workforce is followed by a smaller workforce. In a pure PAYG scheme the revenue from a given contribution rate falls, creating upward pressure on the contribution rate, downward pressure on the level of pensions, or both. This problem is well-understood and not controversial.

Funding, it is argued, can ease the problem: each member of the large workforce in period 1 builds up pension savings; the pension available for a representative worker is exactly what can be covered by those savings; if there is a large number of such workers, this is not a problem, it is argued, because each worker accumulates enough, on average, to pay for his or her own pension. This argument is correct in terms of *finance* but may fail to provide workers with the *consumption* they expect in old age. With PAYG, the shortfall comes through a decline in social security contributions. With funding, the mechanism is less direct but has the same cause: unless a decline in the number of workers has no effect on output, output will fall; and if output falls consumption and/or investment must fall. Lower rates of return or higher prices deny pensioners the consumption they expected; or mandatory increases in pension savings by workers reduce their consumption by more than they would choose; or the increase in the combined consumption of workers and pensioners is at the expense of investment, and hence puts future growth at risk. As noted, PAYG and funding are both mechanisms for organising claims on future output; since demographic change generally affects that output, it generally causes problems for pension schemes however they are organised.

Even more clearly, suppose that the birth rate is stable but the life expectancy of pensioners increases, thus increasing the number of pensioners per worker. With pure PAYG this increase requires a higher contribution rate or lower monthly benefits. With funding and no change in interest rates, the sustainable level of monthly benefits is lower if retirement is longer.

What matters is not financial accumulation but output. If output increases, it becomes easier to meet the claims of both workers and pensioners. The solution to population ageing lies not in funding per se but in output growth.

2.3. The micro-economics of pensions: imperfect consumer information and decision-making are pervasive

Two bodies of literature help to explain why choices about saving and pension provision may be suboptimal: that on the economics of information, and a recent and growing literature on behavioural economics (see UK Pensions Commission, 2004a: 207–210; Tapia and Yermo, 2007; and Thaler and Sunstein, 2008).

Imperfect information

Individuals can be misinformed in various ways:

- Some individuals have a poor sense of the risks and uncertainties they face, for example, about their longevity.
- Individuals can be badly informed about complex pension products which are based on an array of financial institutions and financial in-

[3] Barr (1979); for a recent restatement see Barr (2000, IIA).

struments. Many do not understand basic concepts in finance: Orszag and Stiglitz (2001: 37) quote the chairman of the US Securities and Exchange Commission as stating that over 50% of Americans did not know the difference between a stock and a bond. The problem also has distributional implications, since the worst-informed people are disproportionately among the least well-off; that is, information poverty and financial poverty are highly correlated.

- For some purposes it is useful to recognise that the problem may not be an information problem but an information processing problem. An information problem can be solved by providing the necessary information. With an information processing problem, matters are too complex for many people to choose well even when they have the necessary information. Such problems are more likely where the time horizon is long, where the product or service involves complex probabilities, or where information about the features of the product is inherently complex. All these conditions characterise most pension products.

Imperfect decision making

The literature on behavioural economics sheds considerable light on decision making. In the context of old-age security, many people do not save enough voluntarily. Instead widespread manifestations of suboptimal behaviour are observed.

Delayed choice or no choice:

- Procrastination: people delay saving, do not save, or do not save enough. With retirement saving, as elsewhere, people agree that they should do more but delay action (Choi et al., 2001).
- Avoiding explicit choice: in theory it should make no difference whether individuals face an opt-in or an opt-out provision; in practice, automatic enrolment leads to much higher participation. Participation rates in employer 401(k) plans in the USA differ sharply depending on whether or not enrolment was automatic with an opt-out (Madrian and Shea, 2001).
- Immobilisation: complexity and conflicting information can lead to passive behaviour. People presented with a larger range of 401(k) options participate less. A large fraction of new workers in Sweden make no choice at all.

Faulty choice:

When people do choose, their choices may make little sense:

- Short-term gratification: many people retire at the earliest age permitted, which may be too early for their own good or that of their spouses.
- Framing: choices are influenced by how they are presented. '[P]eople who learn first about the risks of a treatment followed by its benefits make different choices than people who first learn about its benefits and then its risks. Decision aid developers have no choice but to present information in one order or another, but unfortunately the order they choose will almost inevitably affect people's decisions' (Loewenstein and Ubel (2008: 1806).
- Familiarity: another poor but common choice is to invest heavily in the stock of one's employer; if the firm goes bankrupt, employees lose both their wage income and much of their capital accumulation, as with employees of Enron. Such behaviour shows a total failure to grasp the benefits of diversifying risk.
- Herd instinct: People follow fashion, as in the technology boom of the late 1990s.

Recent experimental evidence suggests that people can have a high discount rate in the short term (that is, a tendency to instant gratification) and a lower one in the medium term. The problem is that when the future arrives, it becomes the present; hence short-term gratification continues.

Implications

Thus people can be myopic and may make decisions that do not reflect their own best interests. The problem is not trivial, so that the simple assumption of rational utility maximisation may not hold for pensions. What is needed is what economists call second-best analysis.

More concretely, these findings suggest a number of implications for policy design, many of them exemplified by the US Thrift Savings Plan discussed in Box 3:

- Keep choices simple to address information problems, for example, by offering only a small number of clearly differentiated funds.
- Use automatic enrolment, thus turning inertia to the individual's advantage: once automatically enrolled, most people will stay with the scheme.
- Design a good default option: an arrangement based on automatic enrolment plus worker choice of schemes requires a default option for workers who do not make a choice (see Beshears et al., 2008).

2.4. Stochastic elements: pension schemes face large risks

All pension schemes face some risk.

- Macroeconomic shocks affect output, prices or both.

- Demographic shocks affect all pension schemes by affecting market prices and quantities and pension claims.
- Political risks affect all pension schemes because all depend critically, albeit in different ways, on effective government.

Pensions that accumulate funds face additional risks:

- Management risk can arise through incompetence or fraud, which imperfectly informed consumers generally cannot monitor effectively.
- Investment risk: accumulations held in the stock market until retirement are vulnerable to market fluctuations.
- Annuities market risk: for a given pension accumulation, the value of an annuity depends on remaining life expectancy and on the rate of return the annuity provider can expect over those years.

Implications
Some risks are faced by any pension system, others only by particular arrangements. Thus key elements in any pension system are: (a) how to accommodate risk; and (b) how risks are distributed across participants.

Private insurance markets can help individuals to bear some of the risks inherent in preparing for retirement. But there are limits to private insurance from adverse selection, from selling costs, from the limited ability of consumers to make good decisions, and from incomplete markets for risk-sharing, particularly across cohorts. Social insurance can share risk more broadly, not least because governments have a wider array of instruments for sharing risks than do private markets. The costs of adverse outcomes can be borne by the pensioner through lower pensions, by workers through higher contributions, by the taxpayer, through tax-funded subsidies to pensions, and/or by future taxpayers and beneficiaries if subsidies are financed by government borrowing.

2.5. Administrative elements: implementation matters

Good policy design is important; but the best design will fail to achieve its objectives if financial, political and administrative capacity are lacking. Policy design that exceeds a country's capacity to implement it is bad policy design. The importance of implementation is often underestimated. It requires skills that are just as demanding as policy design, and those skills need to be involved when the policy is designed, not as an afterthought.

Implications
A state scheme needs to be compatible with the government's capacity to run it effectively. An earnings-related public pension requires that government can:

- track and record a worker's earnings across an entire working life;
- track across jobs, employment status, and geographical regions;
- keep workers informed through regular statements;
- calculate benefits accurately;
- pay benefits accurately and promptly;
- make the calculations and adjustments necessary to keep the system financially sustainable, either automatically or by legislated changes.

Merely listing these requirements emphasises their stringency.

Administrative costs in private schemes are important and often overlooked. The administrative costs of individual accounts are significant even in large, developed countries with long-established systems, and considerably higher for small accounts in small countries starting a new system. For example, a charge of 1% of assets each year over a 40-year career reduces accumulations by nearly 20% at retirement.

Problems are not restricted to developing economies. Pensions were mis-sold in the UK in the 1980s. Problems can also arise with the regulation of private defined-benefit schemes. When a firm or industry with an inadequately funded defined-benefit pension gets into financial trouble, its workers and retirees lose some or all of the pension they were expecting. Countries have responded in a range of ways, including government-provided guarantees and the imposition of funding requirements. None of these is a perfect solution. Policies designed to ensure the long-term stability of defined-benefit schemes face an inherent tension: too little regulation leaves workers with inadequate protection, but too much imposes excessive costs on a scheme's sponsor, often at inopportune times, leading to withdrawal of the scheme, at least for new members. We return to the issue of regulatory design and accounting standards in the concluding section.

3. Drivers of change: why are things developing as they are?

This section discusses trends over the past century that frame pensions policy, and a series of more recent changes over the postwar period. It then discusses how policy makers have responded. The section concludes by discussing why things are developing as they are.

3.1. Long-term trends

The pensions 'crisis' is not a surprise, but the result of a series of well-known long-term trends.

Demographic change – Life expectancy has been rising for a long time. Declining fertility is occurring not only in industrialised but also in poorer countries. Both trends are widespread, including the USA, Western and Northern Europe, the European former-communist countries, Japan and many developing countries.

Declining labour-force participation of older male workers – This trend is, in part, a response to rising living standards. As people become richer, they can afford more leisure. Thus the labour-force participation of older workers in many countries is considerably lower than for younger workers. Earlier retirement and longer life combine to increase the duration of retirement, which ranged from 15 years for men in Japan in 1999 (where 25% of men are still working at 77), to nearly 21 years in Italy, and even longer for women.

3.2. Changes over the postwar period

Superimposed on these long trends are changes since the end of the Second World War.

Growth in pension systems – Pension systems before the Second World War tended to cover urban workers, but often not workers in agriculture, and to offer only small benefits. Extension of pension systems has been a widespread feature of postwar policy.

The baby boom is fairly widespread and, when combined with demographic trends, has powerful effects in some countries. But its importance should not be exaggerated. Barr and Diamond (2008: Figure 1.5) show that projected age pyramids for 2050 are not strikingly different in a country like the USA from a country like India, which had no baby boom.

Growth of female labour-force participation – The archetype of male breadwinner and female caregiver was never the entire story in the West, and female labour-force participation was always high in the Soviet system. Over the postwar period throughout Western countries, women in increasing numbers have increasingly taken on paid work. In the short term, the presence of more workers eases the short-term finances of a PAYG system. A separate implication is the need to design systems that properly recognise entitlements that a woman builds on the basis of her own earnings record.

All these elements – the long-term trends and postwar changes – have direct and obvious implications for the costs of pension systems. Two further changes have important implications for other aspects of pension design.

A changing international environment

Alongside reduced restrictions on international trade and finance has been increasing awareness of international labour mobility. The treatment of migrants and – connected – the international portability of pension rights, is a matter of growing salience, notably the unresolved issue of how to organise pension rights within the wider EU.

More fluid family structures

In many countries, the nuclear family has neither the stability nor the numerical dominance it had 50 years ago. In a world where most people were in stable marriages, the most common reason for women being single was widowhood, which could be addressed by including widows' benefits in a pension system. Today, in addition, many women are single after a divorce or were never married. In the UK, something like 40% of mothers can now expect to be a lone mother for some part of their adult life.[4] Pension systems need to be designed to accommodate living arrangements that are diverse across people and changing life patterns.

3.3. Responses 1: Developments in pension design

The economic and social context in which pensions operate today is thus very different from that in 1950: the economic and social environment is different; there has been a natural maturing of pension systems; and change is required to accommodate long-term trends. This section discusses how policy makers have responded, starting with developments in pension design and then, in the next section, the options for adjusting pension systems to long-term trends.

Addressing gaps in coverage

Though systems with wide coverage have reduced poverty rates, poverty among older people remains. The problem arises partly from incomplete contributions records. Incomplete coverage arises in countries with immature pension systems, limited institutional capacity and/or a large informal sector. However, it also comes from fragmented careers and fluid family structures even in countries with nearly full coverage. Thus it is no accident that even in advanced countries not all workers have a full contributions record. In the UK in 2005 only about 85% of recent male retirees and 30% of women retirees were entitled to a full basic state pension.

It is thus mistaken to imagine that better administration is a complete answer. The design of pension systems must recognise that gaps in contributions will occur. One approach has been to adjust the contribution rules, for example, by extending contribution credits to people who are unemployed or caring for young children. Another has been to reduce the number of years to qualify

[4] Of that total, about half will be a lone parent for more than five years (Ermisch and Francesconi, 2000).

Box 2
Non-contributory pensions

Non-contributory pensions address coverage, with the great potential advantage of extending benefits to people with limited contributions records, especially women, people with fragmented careers, and workers in the informal sector.

High-income countries – New Zealand and the Netherlands have non-contributory pensions financed from general revenue or earmarked taxes, payable to everyone who meets a residency requirement. Australia has a similar system, but the benefit is subject not to an income test, designed to restrict benefits to the poor, but to an affluence test, which has the more limited purpose of clawing back benefits from the rich.

Middle-income countries – South Africa has a non-contributory pension, illustrating how such an arrangement can work in a developing country and, moreover, can extend to the rural population. As discussed below, Chile introduced a non-contributory pension in 2008.

Low-income countries – A number of low-income countries have non-contributory pensions (sometimes called social pensions), including Bolivia, Botswana, Namibia, and Nepal. Total spending is typically small (below 1% of GDP in Botswana, Namibia, and Nepal), and the benefit is also generally small (Willmore, 2006: Table 1).

Where a government has the necessary implementation capacity, policymakers have a range of options to contain costs:

- The level of the pension can be kept low (for example, it is only 10% of GDP per capita in Botswana and Nepal).
- The age at which the pension is first paid can be set high (in Nepal only 1.1% of the population are older than the qualifying age).

for a pension.

A different approach, recognising that gaps in contributions are unavoidable, is to have a non-contributory universal pension, as outlined in Box 2.

Indexing benefits

Indexing pensions in payment is central to efficient consumption smoothing. Countries have incorporated indexing, sometimes to prices, sometimes to wages, and sometimes to a mix. As well as indexing benefits in payment, an additional development in many countries has been to index contributions or earnings records during working life, usually to wages.

Changing the basis of indexation can have significant effects. In the later 1980s, reforms in the UK indexed the basic state pension to changes in prices rather than (as previously) to wages. As a result, the basic state pension fell from around 20% of average earnings in the mid-1980s to 16% in 2002 (UK Pensions Commission, 2004b: Figure F.3).

Adjusting gender balance

Over the last half century, many countries have moved the legal structure of their pension system towards or fully to gender neutrality. The increased fluidity of family structures means that basing a woman's benefits substantially on her husband's contributions is increasingly unsatisfactory. Because of changed attitudes it is also widely regarded as undesirable, with increasing emphasis on the rights of women as citizens.[5] A well-designed pension system should seek to be gender-neutral but should also recognise the existence of families. Thus pension design should protect the rights of spouses in respect of the death of one member of a couple and of divorce. A separate issue is whether, how and to what extent a pension system should recognise years spent caring for children.

Introducing notional defined contribution (NDC) pensions

A recent innovation in pension design, NDC pensions (see Box 1) have been implemented in a number of countries, including Sweden and some of the post-communist countries.

Addressing the administrative costs of individual accounts

Administrative costs have important ramifications. As noted, over a full career an annual management charge of 1% reduces a person's pension accumulation, and hence his pension, by about 20%. It is no accident that competition has not led to low

[5] In the UK, until 1978, a married woman could opt to pay a greatly reduced national insurance contribution which gave no entitlement to a pension, on the basis that she was covered by her husband's contribution. Such an arrangement today would be unthinkable, as well as violating EU law.

administrative costs. Individual accounts offering the individual a choice of provider or of portfolio are inherently costly to administer; moreover, those costs are largely a fixed overhead per account and hence are particularly an issue for smaller accumulations. Thus policies aimed at strengthening competition have been tried but, in the absence of stringent regulation, have not been very successful.

In response to increasing awareness of the size of these costs, countries have explored other ways to reduce them. Sweden has centralised much of the administration, which it combines with price controls. The US Thrift Savings Plan, for federal civil servants (Box 3), has combined centralisation with very limited choice. The UK is proposing to introduce a simple savings scheme with limited choice and centralised account administration.

A system with a government-selected portfolio can have lower transaction costs, but can easily have a low rate of return. Good quality investment is more likely with transparent accounting, including a clear and explicit remit, independent non-political management, and detailed, published audited accounts.

Strengthening the governance of private pensions
Strengthening the regulation of financial markets has been an ongoing and necessary process in all countries including the most advanced. In parallel, many countries have increased the requirement that private pensions be funded and strengthened the regulation of private pensions.

Strengthening funding requirements is meant to safeguard the future interests of current workers and to protect government revenues if the government insures pensions. On the face of it, stringent funding requirements will benefit workers; but as discussed earlier, it can be counterproductive to impose on employers too much of the cost or too much of the risk.

3.4. Responses 2: Economic adjustment to long-term trends

Countries have responded in a range of ways – mostly recently – to financial imbalances. Some policy makers ignored the problem, with deficits paid out of general taxation, as in some countries in the wider EU. A range of other policy directions is generally more realistic: higher contributions, lower pensions, and later retirement. Economic growth also assists adjustment, so policies to raise output, such as increased saving, are also an important part of the picture.

Higher contributions
Contributions have tended to rise in most countries, by increasing the percentage rate of contribution or raising the range of income on which contributions are payable. Though there is room for variation, contribution rates face the constraint of incentive effects, particularly in the face of international competition. Given the extent of population ageing in many countries and existing contribution rates, higher contributions on their own are not usually a complete solution.

Lower pensions
If people live longer and nothing else changes, the average pension will have to fall. This approach avoids fiscal problems, but risks pensioner poverty. In countries with NDC systems, for example, Sweden and Poland, the level of benefits decreases automatically in response to increased life expectancy. As an NDC system is quasi-actuarial, people can offset the decline in benefits by working longer.

Later retirement
People are living longer; that is not a problem, but a triumph. The problem is not that people are living longer but that they retire too early given increased healthy lifetimes and the contribution rates in place. If we were designing a pension system for a new planet whose native life form was living longer and longer, we would not choose an earliest entitlement age that was fixed for all time at age 65. Thus governments are seeking: (a) to increase the employment rates of all workers including older workers; and (b) to encourage labour-market flexibility so that older workers have choice over the move from full-time work to full retirement.

Pensions, saving and growth
Policies to promote growth are an important part of the response to demographic trends. One element is higher saving from additional revenues. The Norwegian Government Petroleum Fund (Norway Central Bank, 2005, 2006) uses some of the revenues from oil taxation, as a buffer against demographic change. The US has built up a trust fund, with payroll tax rates above that needed to cover expenditures, to be run down as part of accommodating the retirement of the baby-boomers.

Also of concern are broader strategies to promote growth:

- Measures that can increase worker productivity include more and better capital equipment, improving the allocation of capital by better capital markets and tax policies, improving the quality of the labour force through more education and training, and improving labour mobility to allocate labour more productively.
- Measures that can increase the number of workers from each age cohort include policies to increase labour supply (for example, by married women by offering better childcare facilities), raising the average age of retirement, raising fertility and importing labour.

Box 3
The US Thrift Savings Plan

The US Thrift Savings Plan for federal civil servants (www.tsp.gov), established in 1986, is a response to the need to contain administrative costs and also to the information and decision-making problems discussed in Section 2.

Initially voluntary, the scheme has now moved to auto-enrolment. The scheme offers participants very limited choice. In 2007, workers could choose from six funds, including funds holding government bonds, private bonds, a stock market index or a global stock market index; another option was a fund that moved from equities to bonds over the worker's life cycle. A government agency keeps centralised records of individual portfolios. Fund management is on a wholesale basis. Investment in private sector assets is handled by private financial firms, which bid for the opportunity (and which manage the same portfolios in the voluntary private market). As a result, administrative costs are astonishingly low: as little as 6 basis points annually, or 60 cents per $1,000 of account balance.

The approach should be of interest to other countries considering reform, in particular to developing countries where institutional capacity is limited.

The message for policy makers is to consider the entire menu of pro-growth policies.

In sum, the problems of pension finance are resolved if output rises sufficiently. To the extent that that does not happen (faulty policy) or cannot happen (environmental constraints), the remaining options are to reduce the consumption of workers through higher contributions, or the consumption of pensioners either by paying a lower monthly benefit or by paying a given monthly benefit only at a later age.

3.5. Why things are developing as they are

Increased longevity, declining fertility and reduced labour-force participation by older men are all trends that are long-term and well-known. In principle they can be addressed by adjusting contributions and benefits, by increasing retirement age without a compensating increase in benefits, and by policies to increase output. Thus the current 'crisis' is not a crisis. It is a problem that has known and long-term causes and known solutions. The problem is not so much the underlying economic and demographic realities than the political difficulty of making the necessary changes. Pension systems are developing the way they are mainly because of lack of adjustment to long-term pressures. The problem is not an economic failure but a political failure.

4. Outcomes: why do systems differ?

Drawing on previous discussion, this section starts by explaining why there is not – and cannot be – a single best pension system. It then gives brief descriptions of pension systems in a range of countries, and concludes by setting out the range of options available to a developed economy.

4.1. No single best pension system

The argument that there is no single best pension system derives from economic theory, which determines what is optimal, and from considerations of implementation, which determine what is feasible.

The argument is straightforward. Pensions have multiple objectives, notably the achievement of consumption smoothing, insurance, poverty relief and redistribution.

In pursuit of these objectives countries face a series of constraints:

- Fiscal capacity: other things being equal, a larger tax base can finance a given pension with a lower contribution rate and hence less potential distortion.
- Institutional capacity: stronger institutional capacity enlarges the formal tax base and makes feasible a wider range of options for pension design.
- The empirical value of behavioural parameters, such as the responsiveness of labour supply to the design of the pension system, and the effect of pensions on saving.
- The shape of the pre-transfer income distribution: a heavier lower tail of the income distribution increases the need for poverty relief.

There is no single best system for several reasons:

- Objectives can differ: policy makers will attach different relative weights to the objectives, including the importance of poverty relief and about how risks should be shared within and across generations.
- Constraints differ: the pattern of constraints, including the values of key parameters, will differ over time and across countries.

- Political processes differ, affecting what is politically feasible.

4.2. What are the different systems?

Countries have chosen systems which vary from more or less pure consumption smoothing in the form of mandatory saving with little or no insurance (Singapore, which has a state-administered provident fund, in essence a savings plan) to a system whose primary concern is poverty relief through a non-contributory flat-rate pension, with consumption smoothing on a voluntary basis (New Zealand). In between, a wide range of systems explicitly address both objectives, some with substantial reliance on mandatory funding (Chile), some with intermediate reliance on mandatory funding (Sweden, USA), and others mainly on the basis of PAYG arrangements (France, Germany, Italy). The Netherlands has a non-contributory PAYG universal pension, based on years of residence, together with funded occupational pensions. Reforms in Chile, discussed below, strengthen poverty relief by introducing a non-contributory PAYG universal pension alongside its existing system of individual funded accounts. Thus countries have successfully implemented pension systems using very different structures.[6] Most of the illustrations that follow are from developed countries, the exceptions being Chile, whose pension reform of 1981 has fascinated commentators and influenced other countries, and China, which illustrates how over-ambitious reform can run into implementation problems.[7]

Chile

Since 1981, Chile has had a system of mandatory, funded, privately-managed individual accounts, with free entry for any firm able to meet heavy regulatory requirements. Employees are required to contribute 10% of earnings. Workers may take their pensions as inflation-indexed annuities or as phased withdrawals.

The individual accounts provide consumption smoothing, supported by various institutions to assist poverty relief. Until 2008, a minimum pension guarantee, financed from general revenue, was available for those who had contributed to the mandatory system for at least 20 years; in addition, a means-tested pension, also financed by general revenue, paid a benefit at about half the level of the minimum guarantee.

The post-1981 system in Chile was rooted in competitive supply, the argument being that competition would increase choice and drive down administrative costs. Not least because of the information and decision-making problems discussed in Section 2, these predictions were not borne out. A Chilean Senator at a conference in 2004 spoke of the seven 'deadly sins' of Chilean pensions: low coverage, low pensions, high administrative costs, high fiscal costs, gender inequality, limited competition, and political tests for Boards of Directors of pension funds.

For such reasons, a Presidential Advisory Council on Pension Reform was appointed. The central recommendation of its Report (Chile Presidential Advisory Council, 2006), was to replace the minimum guarantee and the means-tested pension by a non-contributory basic pension financed out of taxation, payable to the poorest two-thirds of the population. The non-contributory pension is being phased in from 2008.

In sum, the post-1981 system in Chile gave heavy weight to consumption smoothing, with some insurance through voluntary annuitisation and with limited weight to poverty relief. The primary lessons are threefold:

- Mandatory funded individual accounts can be part of a good reform, but such a reform is not easy and depends on complementary reforms.
- Private supply plus competition are not on their own sufficient to keep down transactions costs or charges.
- Unless accompanied by a robust system of poverty relief, individual accounts are not a pension system, but only a part of a pension system.

China

Since 1997, China has moved from an enterprise-based system of defined-benefit pensions based on final salary towards a unified system for urban workers. The new system has three elements: a defined-benefit, PAYG, first-tier pension (the social pool); a mandatory, funded, defined-contribution pension; and voluntary, enterprise-based pensions.

Since 1999, coverage was expanded with the intention of including the employees of private and other types of enterprises in urban areas, the self-employed, and (it was hoped) the informal sector. But the expansion of coverage has been limited. The system is financed by dedicated contributions, mainly from firms and workers, with some financing also from government.

This system makes long-term strategic sense but

[6] For useful institutional description, see OECD (2007), the international updates issued by the US Social Security administration on http://www.ssa.gov/policy/docs/progdesc/intl_update/, and the resources in the Global Aging Program of the American Association of Retired People (AARP) on http://www.aarp.org/research/international/map/.

[7] I participated in recent reforms of the pension system in Chile, including discussions with the Presidential Advisory Council in May 2006. And Peter Diamond and I were members of a group invited to advise the government of China on pension reform – see Asher et al. (2005) for the report of the group.

has not functioned as intended. The three elements together offer poverty relief, insurance, and consumption smoothing, with some allowance for differing tastes. However, there are serious problems of fragmentation, system financial deficits, and administrative difficulties. These are particularly visible with the funded individual accounts.

The Netherlands

The Netherlands has a non-contributory pension of 70% of the net minimum wage, payable at age 65. The system differs in two respects from conventional public pension systems. First, the benefit is awarded on the basis of residence, not contributions. The full pension is awarded at age 65 on the basis of 50 years of residence, reduced by 2% for each year of non-residence. Second, the benefit is financed through an earmarked tax, the AOW premium, which is additional to, but integrated with, the income tax. The AOW premium is levied on income, not earnings, and is paid only by people under 65.

The arrangement can be viewed in different ways. From one perspective the benefit is non-contributory, being based on residence, thus addressing problems of coverage. On the other hand, it is financed from the AOW premium and so can be regarded as based on contributions, but through income tax rather than a payroll tax. Each of these views is valid, and each has support from a different political perspective; thus it is perhaps not surprising that the system has been long lived. The trick, from a coverage perspective, is to require contributions, but not to make benefits conditional on a person's contribution record.

The non-contributory universal pension is combined with a system of occupational pensions by industry. Although, in a formal sense, such pensions are voluntary, once an industry chooses a scheme, participation is compulsory for workers in the industry. Over 90% of the workforce participate in an occupational pension. In recent years, there has been a move from final-salary schemes to career average. Typically these are hybrid defined-benefit-defined-contribution schemes, with benefits based on career averages and with adjustments of both contribution rates and accrued liabilities depending on the solvency position of the fund. Thus, pension funds have responded in ways that share risks among workers, employers, and pensioners more broadly than in either a conventional defined-benefit system (where the risk in a pure scheme falls on the employer) or a conventional defined-contribution scheme (where the risk in a pure scheme falls on the worker).

New Zealand

The bedrock of the system is a non-contributory universal pension (New Zealand Superannuation) paid from general taxation to all persons over 65 who pass a residency test. The pension is 72.5% of the net average wage for a married couple, and more per person for singles. The basic pension is supplemented by voluntary savings, which, unusually, for many years received no tax advantages. The country is also an outlier in that there is no mandatory earnings-related pension.

The savings regime was reformed in 2007 with the introduction of KiwiSaver, a defined-contribution scheme, with tax advantages together with a flat-rate subsidy at least partly to cover administrative costs, and with automatic enrolment, so that a worker who wishes to opt out has to take positive action to do so. The design is simple, in part in recognition of the problems of consumer choice discussed earlier.

Since the pension benefit is universal, exceeds the poverty line, and is based on residence rather than a history of paid work, it is not surprising that, as with arrangements in the Netherlands, the system is highly effective in relieving poverty. The approach also addresses the gender inequalities that often arise with contributory systems, and it accommodates diverse labour market arrangements and fluid family structures, since, for example, a woman's flat-rate pension depends neither on her own record of contributions nor that of her husband.

The system is popular. A referendum in September 1997 on replacing the tax-financed flat-rate pension with mandatory funded individual accounts (along Chilean lines) was easily defeated. Eighty percent of the electorate took part, and 92.8% of those voting rejected the proposal.

Singapore

The pension system in Singapore is built around mandatory, publicly managed, defined-contribution pensions, provided mainly by the Central Provident Fund. Thus the core of the system is an individual savings scheme, with little or no insurance in the form of annuities.

The contributions of participants are channelled into three types of account. The Ordinary Account accumulates funds for retirement but offers earlier withdrawals for approved purposes such as the purchase of a home. The Medisave Account covers hospitalisation and allows the voluntary purchase of catastrophic illness insurance. The Special Account is meant for retirement but can also be used in a limited way for mortgage payments. Contribution rates decline with age, on the premise that lower wages for workers older than 55 will encourage employers to hire them. Alongside the Central Provident Fund, a pre-retirement Central Provident Fund Investment System allows individual choice from worldwide portfolios, although management costs are high.

At retirement a person can choose to buy an annuity but is not required to do so, and few make use of this option. Thus most elderly Singaporeans are exposed to longevity risk. Nor are there any arrangements to address inflation risk.

In sum, Singapore's pension system relies almost exclusively on mandatory savings to provide consumption smoothing. However, accumulations are hampered by substantial pre-retirement withdrawals and by low rates of return to pension savings. Thus the replacement rate (estimated in one study at 20% of previous earnings) is inadequate, nor is there a tax-financed redistributive element to provide poverty relief. Mitigation of longevity, inflation, and political risks is limited. And the design and governance of the system are continuing concerns.

Sweden

After major reform in the 1990s, the pension system in Sweden comprises two elements: (1) a partially funded system of NDC accounts combined with a generous guarantee that keeps all the elderly out of poverty, and (2) a system of funded individual accounts, the Premium Pension. There are credits, both to the NDC pension and to the Premium Pension, for periods when a person is out of the labour force looking after young children or collecting unemployment or sickness benefits.

The system has an 18.5% contribution rate, of which 16 percentage points are for the NDC element and the remaining 2.5% for fully funded individual accounts. The NDC element uses a notional interest rate equal to the rate of growth of average wages. However, if at any time the calculated financial balance of the system is unsatisfactory, that rate is lowered automatically.

Benefits may first be claimed at age 61. The initial benefit is set by a quasi-actuarial calculation based on the mortality of the worker's birth cohort, the age at which he or she first takes benefits, and the anticipated rate of increase in benefits.

The 2.5% of payroll going to the funded individual accounts is collected by the government and distributed to participating mutual funds. The number of funds is large – 785 at the end of 2007. Individuals may choose between funds, up to a maximum of five, with a default fund for the large number of workers who do not make a choice (in recent years about 90% of new workers made no choice). Funds must be approved by the government and must accept the charges established by a centrally set formula. On retirement a worker's accumulated assets must be used to purchase an annuity provided by the government.

Sweden addresses the problem of administrative costs through a central clearing house, whereby the administration and maintenance of individual accounts is centralised. Contributions to the NDC pension and individual accounts are collected together, and the funds channelled wholesale to individual accounts; thus fund managers know nothing about individual contributors. The average annual charge is 0.73% of assets. The system shows that, even in a developed country, fully funded individual accounts can be expensive, and that many workers show no interest in having a wide choice of investments.

UK

Under the *National Insurance Act 1946*, flat-rate contributions gave entitlement to a flat-rate benefit. The retirement age was 65 for men, 60 for women. For a full pension a man needed 44 years of contributions, a woman 40. There was no statutory indexation of benefits, which instead were raised periodically.

The *Social Security Act 1975* replaced the flat-rate contribution with an earnings-related contribution, which gave entitlement to the flat-rate basic state pension and to the new State Earnings-Related Pension System (SERPS). The contribution conditions remained unchanged, with the important exception that a pension credit was introduced for care activities. Participation in the basic state pension was compulsory. Workers also belonged to SERPS unless their employer had opted out, in which case they belonged to their employer's approved occupational pension scheme. Under the 1975 Act, contributions were indexed in line with wage changes, and pensions during retirement in line with the greater of wage or price changes.[8]

Reforms announced in 1986 changed the indexation of benefits during retirement to changes in prices, extended opting out by allowing individuals to choose to have an individual account in place of SERPS or an employer-provided pension, and announced ways in which SERPS would be less generous from 2000 onward. A further reform consisted of a phased increase in women's retirement age to 65 to take place between 2010 and 2015. As a consequence, projected public pension spending in the UK shows the unusual pattern of declining as a percentage of GDP.

By the mid-1990s, however, the UK system faced major problems. The cumulative effects of price indexation and the known failings of coverage in contributory systems created pensioner poverty. Occupational pensions concealed many of the problems of the public system but provided inadequate cover for lower earners. Further reform of the public pension was announced, and attempts made to introduce individual accounts for lower-paid workers. These added to the complexity of the

[8] This is a serious design flaw for the reasons set out in Barr and Diamond (2008: Box 5.8).

system but had little impact. Problems with occupational pensions aggravated the situation, partly because of adverse stock market conditions after 2000, and perhaps also because of overregulation.

These problems were the background for the UK Pensions Commission, whose main recommendations were: (a) a phased increase in the level of the basic state pension; (b) a phased increase in state pensionable age to 66 in 2024, rising thereafter by one year every decade; and (c) the introduction of a national pensions saving scheme with many of the characteristics of the US Thrift Savings Plan (Box 3): limited choice for workers from a small number of funds, centralised account administration, and wholesale fund management. In accepting those strategic recommendations, the government made a further change: beginning in 2010 a full basic state pension will require only 30 years of contributions.

The UK experience exemplifies two strategic errors. First, the system was changed too frequently and with too short a time horizon. Since a central purpose of pensions is consumption smoothing over increasingly long lives, stability over long periods is important; changes should be made infrequently, announced long in advance, and phased in gradually. The second problem, excessive complexity, is in part a result of the first. A system that was originally simple and well understood ended up not only too complex for many in the general public to understand, but complex to the point where many experts had difficulty understanding it.

US

The US Social Security system has been gender-neutral since 1961. Retirement benefits are available to workers with sufficiently low earnings (that is, on the basis of a retirement test) between age 62 and the age for full benefits, which is in transition from 65 to 67. Benefits are based on a worker's 35 best years of wage-indexed annual earnings, with a progressive formula, giving a higher replacement rate to lower earners. A third step is adjustment for the age at which benefits start. The adjustment is roughly actuarially neutral between age 62 and the age for full benefits, but not large enough to be actuarially neutral for ages after that. There are auxiliary benefits for spouses.

Revenue for disability and retirement pensions comes from a 12.4% payroll tax rate up to a taxable maximum. Revenue also comes from some of the income tax revenue derived from taxing pensions. Currently revenue exceeds expenditure; the excess goes into a trust fund, which holds US Treasury bonds. At the end of 2007 the trust funds for retirement and disability benefits held an amount equivalent to nearly 3.8 times expenditures in 2007.

There is no requirement to participate in any pension except the public pension, but workers contribute to an array of employer and individual systems. As in the UK, there is wide coverage by funded schemes, which have seen a steady trend from defined benefit to defined contribution. The Thrift Saving Plan (Box 3), which supplements Social Security for federal civil servants, offers an example of a simple scheme with inexpensive administration.

4.3. The range of options available to a developed economy

This section summarises the options available to a developed economy. Discussion is in terms of first-tier pensions (aimed primarily at poverty relief), second-tier pensions (mandatory, intended to strengthen consumption smoothing), and third-tier pensions (voluntary at the level of the firm or the individual, subject to regulation and perhaps tax advantaged, to accommodate differences in individual preferences).[9]

First tier

Countries should consider either:

- a contributory pension aimed at poverty relief, with any of an array of different designs; or
- a non-contributory, tax-financed pension, either with an affluence test (as in Australia, Chile, and South Africa) or without (as in the Netherlands and New Zealand).

Second tier

The menu includes, separately or in combination (and varying in the difficulty of use):

- a publicly organised, defined-benefit pension, which may be integrated as a single system with the first-tier contributory pension (as in the US) or not (as in France and Germany);
- an NDC system (as in Sweden);
- an administratively cheap savings scheme with access to or requirement of annuities (like the Thrift Savings Plan for federal employees in the US);
- mandatory, funded, defined-benefit pensions sponsored by industry (the de facto system in the Netherlands); or
- funded, defined-contribution pensions (as in Chile and Sweden).

[9] The word 'tier', rather than the term 'pillar' widely used by the World Bank, is used deliberately for two reasons. First, it is linguistically more apt: pillars can be effective only if they are all in place and all broadly of the same size; tiers, more appropriately in this case, are additive, in whatever constellation one wishes. Second, the word 'multipillar' has become identified with a particular form of pension reform; a more neutral term is better.

Third tier
Voluntary, defined-contribution pensions can be organised at the level of the firm or the individual; regulation (particularly of the funding of defined-benefit schemes) is important (and difficult), and any tax concessions should seek to avoid excessive regressivity.

Conclusion
A developed country has a full range of choices. Thus it is not surprising that developed countries have very different systems one from another, from the US with its progressive, earnings-related, partially funded pensions supplemented by voluntary employer and individual pension schemes; to Sweden with its NDC pension system plus mandatory, individual funded accounts; to the Netherlands with its system of non-contributory, flat-rate pensions augmented by near-mandatory participation in a funded occupational pension scheme. But the fact that the range of options is not greatly constrained by issues of feasibility should not be misinterpreted: that a country is capable of implementing an administratively demanding system does not mean that such a system is a good idea or that it is necessarily superior to a less administratively demanding system. New Zealand has a simple pension system through choice, not constraint.

5. A brief epilogue on accounting

Since I am not an accountant it would be wrong to trespass on the centre of gravity of this conference. But I want to end by stressing that accounting standards matter, and not just for reasons of accounting but because different requirements about the way accounts are presented can cause markets to respond differently. The story of occupational defined-benefit arrangements in the UK is illustrative. The story has three elements: pension fund deficits, legislative changes, and a shift towards government bonds.

Pension fund deficits: many pension funds currently face large measured deficits, deriving from three broad sources:

- During the 1990s, when the stock market performed strongly, many companies took contribution holidays.
- In 1997 some of the tax advantages of pension funds were reduced.
- In 2000 the stock market fell sharply, and again in 2008.

Legislative changes:

- Changes in accounting rules change the way the deficit of a company pension scheme appears on the company's books.
- The Pension Protection Fund, which began in 2005, charges risk-rated premiums.

A resulting move into government bonds:

- The redirection of pension funds towards government bonds was, in part, a response to continued shaky stock market performance, strengthened by the fact that the Pension Protection Fund charges risk-rated premiums, hence charges lower premiums for assets like government bonds.
- As a result, the demand for long-dated gilts rose sharply, and the yield fell correspondingly to a low on 50-year indexed bonds of 0.38%.
- To compound the problem, pension fund deficits are measured in terms of the return on high-grade corporate bonds, the rates on which are correlated with those on long-dated gilts; thus the increased demand for long-dated gilts, by depressing yields, makes the measured deficit even larger.

In sum, though, in part, the problem is real, the result of optimistic assumptions about returns to pension funds in the 1990s, in part, it results from the unintended consequences of regulatory changes, including accounting standards.

In reflecting on the state of a firm, there are at least two questions to which it would be good to have answers:

- What is the firm's medium-term trading position? The answer depends largely on views about the future, notably whether there is likely to be a continuing demand for the firm's products.
- What is the state of the firm's pension obligations? The answer to this question depends on the nature and extent of the firm's past promises to its workers, the age distribution of its workers, and its past accumulation of assets. It also depends on the recent performance of financial markets.

From an economist's perspective, these are separate questions that require separate answers. It may be that accountants do not regard the first question as part of their remit. But, since the answer to the second can have implications for the first, it is desirable for some purposes to consider the two questions together or – at least – to think about the second question mindful of the first.

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