

Commentary: The Impact of Population Aging on Financial Markets

Adair Turner

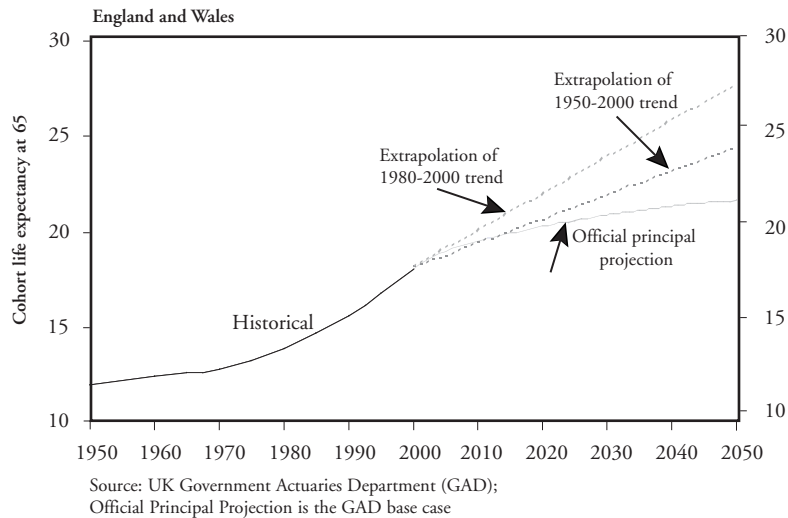
Overall, I agree with Jim Poterba's conclusions. But I will try to draw out some key themes that I believe are particularly important, and illustrate how the issues and estimates that Jim sets out need to be reflected in the pragmatic policy considerations of the UK Pension Commission, which I chair.

Let me begin, as Jim did, with some thoughts on the demographic context. There are two points important to note. The first point is that there are actually three separate demographic effects at work:

1. A rise in life expectancy and, in particular, life expectancy at, say, 65 years old (Chart 1);
2. A long-term sustained fall in the birth rate, a move from above replacement to below replacement level rates;
3. And in some countries, but not in all, a post-war baby boom—a generation both larger in number than the one that preceded it and from the one that followed it.

While we often talk in the developed world of the baby boom and its retirement as the key demographic issue, it is worth noting that at the global level and in the long term, it is the two other effects that

Chart 1
Cohort Life Expectancy for Men at 65



dominate, but that the two effects—rising longevity and a lower birth rate have subtly different implications for public policy and for capital markets, a point I will come back to later.

Second, regarding demography, it is important to stress the global nature of the trends we face. Longevity is increasing everywhere except where there is severe economic and political failure and a high incidence of AIDS. And more surprisingly perhaps, birth rates are falling below replacement level, irrespective of supposed deep cultural differences, wherever we have three conditions: reasonable economic growth, high female literacy, and contraceptives that are adequately safe, legal, and cheap. The fertility choices made by women in successful economies appear to be remarkably universal. Chart 2 shows Catholic Brazil, Sunni Turkey, and Shiite Iran all forecast by the UN to go below replacement fertility rates by 2020. Table 1 illustrates that the biggest demographic challenges in the next 50 years will not be in Old Europe, but will be in China, Japan, Korea, and Singapore. For instance, in Korea the ratio of 20-64-year-olds to 65 plus-year-olds is forecast to fall from 9.0 today to 1.7 in 2050.

Chart 2
Total Fertility Rates—Iran, Turkey, Brazil
1950-2020

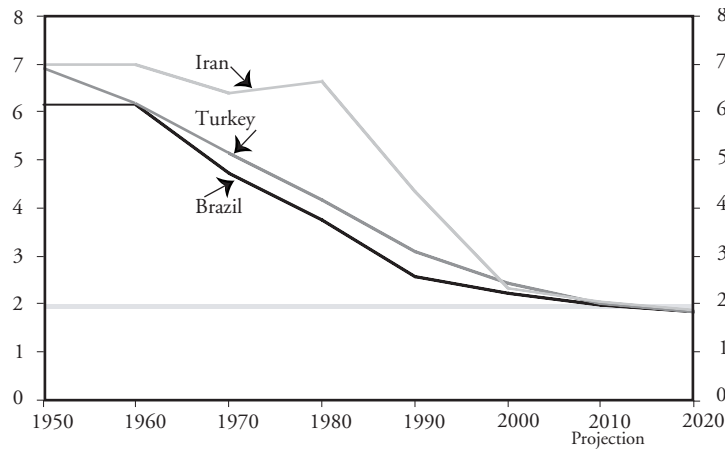


Table 1
Ratio of 20-64 Year Olds to 65+

	2000	2050
UK	3.7	2.1
Italy	3.4	1.4
USA	4.8	2.8
China	8.8	2.4
Korea	9.0	1.7
World	7.8	3.6

Source: United Nations

That is important to capital markets issues, for reasons to which Poterba’s paper alludes. Most of our econometric or theoretical models of demographic effects on capital markets tend to assume closed economies. And the near equivalence between the macroeconomics of pay-as-you-go (PAYG) and funded pension systems—the fact that both depend in some way on a transfer of resources from future workers to future pensioners—is most nearly equivalent in a closed economy. We are tempted to say: “Well, the way around the demographic challenge is to have funded pensions invested in foreign

countries—today’s developed world savers relying for their pensions on output produced by tomorrow’s developing-world workers.” But the developed world in aggregate cannot plan to meet its demographic challenge by investing in China, if China is simultaneously planning to solve its demographic challenge by investing overseas. The global nature of demographic change means that over the long term our closed economy models are not as deficient as first appears.

So, there is a global phenomenon of rising longevity and falling fertility, which, therefore, poses challenges for both state-run PAYG systems and for funded private savings systems.

Whichever way we construct a pension system, there has to be a transfer of resources from some category of future workers to future pensioners. In a PAYG system, the transfer works through imposed taxes/contributions. And if the ratio of pensioners to workers rises, that means higher taxes or lower relative pensioner incomes. In a funded system, future pensioners secure consumption resources by selling accumulated assets to future savers, for example workers, and if the next generation is smaller in number and therefore has a lower target capital stock, that must tend to mean lower returns and/or falling prices of capital assets. As Poterba has said, the theoretical models, which suggest that a fall in the birth rate and thus a change from population growth to population stability or decline must have implications for capital markets, are theoretically compelling.

So, the crucial issue is not the theoretical direction of change but the empirical issue of likely scale and possible timing. And for the UK’s Pension Commission, which is charged with assessing the adequacy of Britain’s current pension saving, that is a far from academic issue. One analysis the commission is conducting is to construct a model of the inputs and outputs of the British pension system. If we are contributing 3.5 percent of GDP into pension funds, which is about the British figure today, what percent of GDP is likely to flow out in retirement pensions to future pensioners in 2030 or 2050, and with what implications for pensioner relative income, given future pensioner numbers? The answer, of course, is

partially dependent on whether demographic factors will depress asset returns and asset prices.

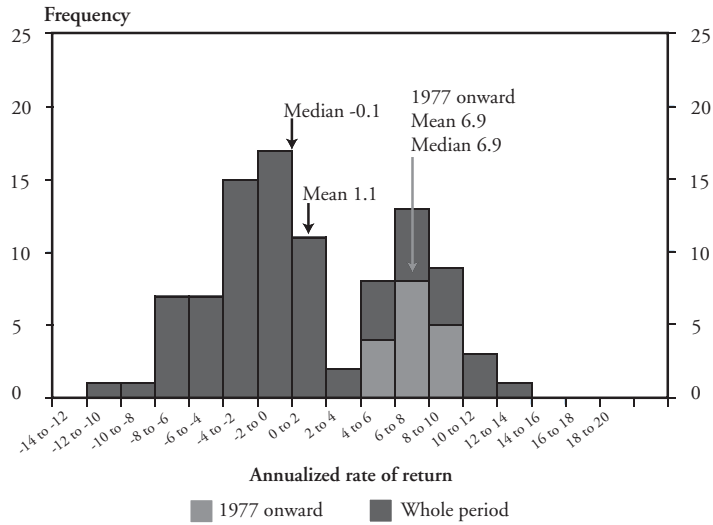
Even absent demographic considerations, of course, predicting future returns would be hugely problematic. There are fundamental theoretical issues, for instance, over whether historic *ex post* equity returns tell us anything even about historic *ex ante* return expectations, let alone about future returns. But for what they are worth, Charts 3 and 4 set out the histograms of returns on equities and on nominal bonds for 10-year periods during the 20th century for Britain. But the pattern is very similar for the United States and most other developed countries. The mean equity return is about 5-6 percent real, but there is a huge dispersion and a clear finding that the returns for periods falling in the last 25 years have been exceptionally high—for equities and for nominal fixed-rate bonds. Even without the demographic factors we consider today, nobody should build a funded pension on the assumption that the returns of the 1980s and 1990s are any guide to the future. If we use the historic record at all, it must be the century-long record on which we focus. But should we, in addition, assume a further negative demographic effect?

Poterba's paper excellently sets out the empirical evidence that helps answer that question, or rather tells us how difficult it is to answer. The econometric results appear to be confusing. We do not find, at a statistically significant level, the correlations between returns and demographic factors, which theory and equilibrium models would suggest. But some analyses of asset prices find statistically significant evidence of movements considerably larger than theory and models suggest.

Although this is frustrating, it is what we should expect. We simply have too few data points and too much noise.

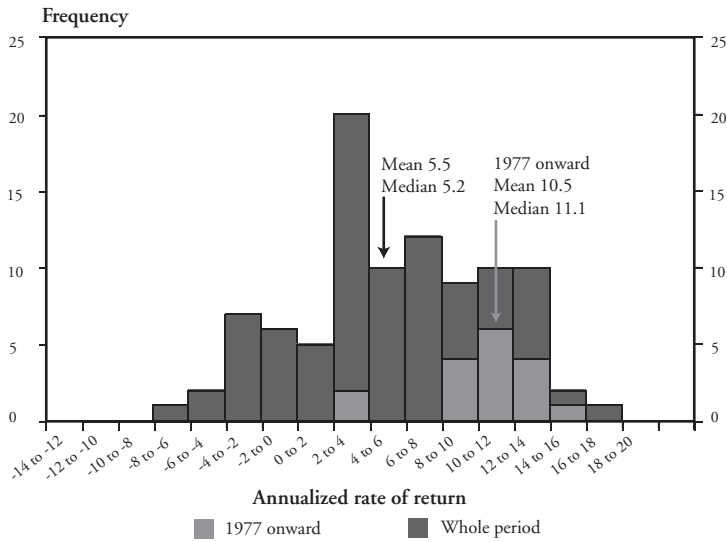
We have only one period of fertility increase (the baby boom) and one of decline available to be analyzed. And we have a record of equity market returns over medium-term periods—say 10-20 years—which is primarily determined not by a sequence of real economic develop-

Chart 3
Real Annualized Rates of Return on UK Fixed-Rate Government Bonds over 10-Year Periods Since 1899



Source: Barclays Equity Gilt Study 2004

Chart 4
Real Annualized Rates of Return on UK Equities over 10-Year Periods Since 1899



Source: Barclays Equity Gilt Study 2004

ments but by changes in market expectations and confidence, by swings of sometimes irrational exuberance and irrational despondency.

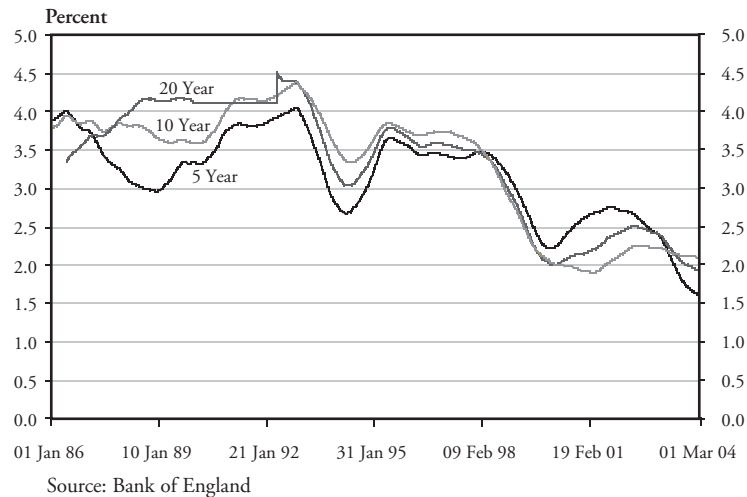
I, therefore, agree very much with Poterba's conclusion: This is an area of economics where empirical econometrics is inherently handicapped, but where the conclusions of theory are directionally robust, and where, as Jim writes, "the theoretical models should be awarded substantial weight."

For the practical purposes of the pension commission, this means simply that while we use very long-term historic average returns on equities as our base case, we note that there is a difficult-to-quantify potential downside from demographic factors. We note that demographic factors provide an additional reason—additional that it is to the end of irrational exuberance—for believing that the returns of the last 20 years are extremely unlikely to repeat.

Plugging those assumptions into our pensions commission model, we find that the present level of UK pension saving is going to produce inadequate pension income and that Britain has as big a pension problem as other European countries with similar demographics—for instance, France—but a different problem. France is heading toward a fiscal crisis of unaffordable state promises: Britain is heading toward increasingly inadequate pensions for many people. But the problem is the same: fewer future workers relative to pensioners—unless, that is, average retirement ages increase substantially, which surely they should. I think that a key deficiency of the studies that Poterba has summarized—and indeed of much policy discussion of pension issues—is that it tends to take the future ratio of workers to pensioners as an exogenous given. Professor Poterba's Table 1 and my Table 1 present projections of the ratio of 20- to 64-year-olds to 65-plus-year-olds as if this were the ratio of workers to pensioners.

But if we are living longer, and if many of the extra years are healthy and potentially productive years—and I believe that is what the evidence suggests—then in the design of PAYG systems, the retirement age *should* rise, and in a funded pension system where people

Chart 5
Real Yields on UK Index-Linked Government Bonds
1-Year Moving Averages



make their own decisions it *will* rise. If it really is the case that as the baby boomers retire asset prices will fall, then people saving in defined contribution schemes will respond to prospectively lower retirement income by delaying retirement, increasing the number of years of saving, and securing higher annuity rates.

UK Pension Commission analysis illustrates that people in defined contribution pension schemes, on average, retire later than those in defined benefit schemes with fixed retirement ages, and that the retirement ages of people in defined contribution schemes are increasing as annuity rates fall.

The retirement age should therefore be an endogenous rather than exogenous variable in our models. Once we treat it as endogenous, an interesting result emerges that illustrates two points I made earlier—first, the need to distinguish longevity from fertility effects; second, the near equivalence of demographic impacts on PAYG and funded systems.

If the only demographic factor we faced were increased longevity beyond 65, with no fall in fertility, then it is easy to illustrate—for a PAYG scheme—that a proportional increase in the retirement age (for example, the increase required to keep stable the percentage of adult life spent working), would be a fully sufficient response to the demographic challenge and that no increases in contribution rates nor reductions in pension generosity would be required in addition to keep the system financially sound.

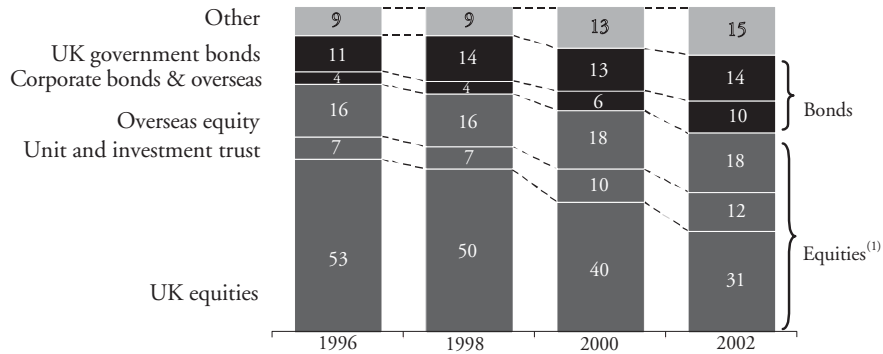
But it is also easy to illustrate the near-equivalent finding for a funded system—that if the only demographic factor were increasingly longevity beyond 65 and that if retirement ages rose roughly proportionally in response, then for any given pensioner savings rate and any rate of decumulation in retirement, there would be no change in the balance of supply and demand for capital assets nor in the capital/labor ratio and thus no reason to expect any demographic effect on asset prices or on returns.¹

Proportional rises in retirement ages are sufficient solutions to that element of the demographic challenge that arises from increasing longevity in both funded and unfunded systems.

The problem is that because of the decline in fertility, even proportional rises in retirement ages are insufficient to offset the actual increases in dependency ratio we face. But they should still be part of the policy response, either via increases in retirement ages within state PAYG or private-sector defined benefit schemes, or via shifting the long-term average longevity risk to individuals.² This can be achieved through a shift to funded defined contribution schemes. But it can also be achieved in ways that shift long-term longevity risk to individuals while still absorbing investment return risk at the scheme-provider level—as the “notional defined contribution” element of the Swedish system does.

But that raises a wider set of issues about who should bear risks within a pension system—investment risk as well as longevity risk. And changes in the pattern of who bears risk and in the asset class

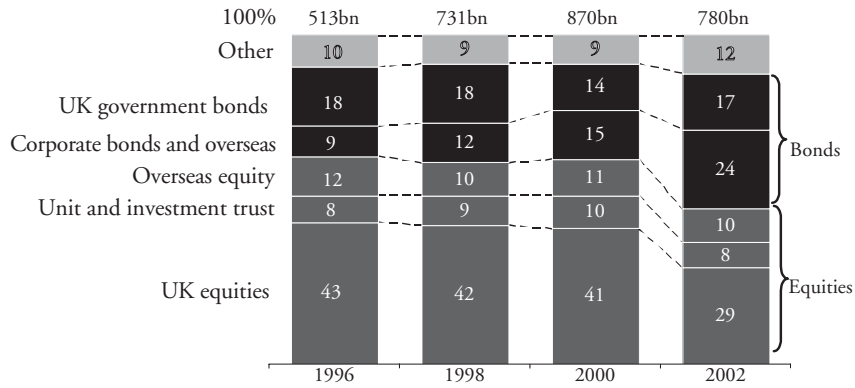
Chart 6
Pension Fund Asset Allocation: 1996-2002
Percent of Total Pension Fund Investment



(1) Majority of unit and investment trust investments are indirect holding of equities: small quantity of bonds also held in this indirect route.

Source: UK Office of National Statistics

Chart 7
Life Company Asset Allocations: 1996-2002
Percent of Total Life Company Investment



Source: UK Office of National Statistics

decisions made both by individuals and by intermediaries will probably have a bigger influence on capital markets in developed countries over the next 5-10 years than the long-term influences on overall returns and asset prices, which Professor Poterba and I have mainly discussed. Certainly in the UK, as my final charts show, we are seeing a retreat of corporate pension funds from a risk intermediation role, and a shift in their asset allocations from equities to bonds. We also are seeing a retreat of insurance companies from an equity return-smoothing role. Together, this implies a net reduction in classic financial stability risks, that is, risks arising through financial intermediation, but an increase in risks being borne by individual households. And we are seeing an increasing demand for index-linked bond securities to support real indexed annuities, which is depressing the yield on the limited supply of index-linked government bonds, but which could be met either by changes in government funding strategies or by the logical but until now very limited emergence of a corporate index-linked market. I would be happy during discussion to touch on those issues, which probably have more immediate market importance, though they are also more specific to individual countries and markets.

Endnotes

¹Note that due to a complex second-order effect to do with additional years of return compounding, and provided the rate of return exceeds the growth rate, the required increase in the retirement age in the funded system is very slightly less than proportional: With a fully proportional rise in retirement age, the equilibrium solution implies a very slight fall in the savings rate.

²Note: By “long-term average longevity risk,” I mean the risks arising from the fact that current estimates of what average life expectancy at 65 *will* be in, say, 30 years are highly uncertain. This risk needs to be distinguished from (i) “average longevity risk during retirement,” that is, uncertainty about the average life expectancy from now on of the cohort now retiring; and (ii) “specific longevity risk during retirement,” that is, uncertainty about how long an individual will live during retirement. Both the latter two risks can be absorbed by annuity markets, by the state, or by private defined benefit providers, even while shifting long-term average longevity risk to the individual.