

Infrastructure Needs and Pension Investments: Creating the Perfect Match

by

Frederic Ottesen*

The life insurance and pensions sector manages large funds with a truly long time horizon. These investors therefore naturally seek long-dated assets to match their liabilities. Real assets or real cash flows are preferred in order to hedge against inflation, which is particularly relevant for pension funds in order to assure a decent purchasing power for their clients' retirement income. Many countries have the daunting tasks of refurbishing and expanding infrastructure, maintaining and expanding public real estate – and doing this in an environmentally friendly manner. Well-conceived infrastructure investments promote productivity and efficiency in both the public and private sector and foster economic – potentially also “green” – growth. Large amounts of capital are needed. Many nations cannot tap the private capital markets as easily as before. Infrastructure investments could be the “perfect match” for a portion of pension savings. Therefore, the link between the capital at hand and its accessibility for infrastructure investments needs to be improved, via regulation, co-operation and communication that foster public-private partnerships, as well as government leadership.

JEL Classification: G11, G18, G22, G23, G3, H54.

Keywords: infrastructure investment, long-term investment and saving, pension funds, institutional investors.

* Frederic Ottesen is Senior Vice President, IAM, Storebrand Asset Management. This article is based on a keynote speech delivered by the author at the OECD High-Level Financial Roundtable on Fostering Long-Term Investment and Economic Growth on 7 April 2011. This work is published on the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein are those of the author and do not necessarily reflect the official views of the Organisation or of the governments of its member countries. The author would like to thank Per Sandberg of Accenture Norway for helping make this publication possible.

I. Introduction

Tapping pension funds for long-term infrastructure investments

A vast amount of new infrastructure must be built, rebuilt, and retrofitted over the next four decades. Tapping into the investment potential of pension funds would help provide the needed capital, and the long investment horizon should suit pension funds well.

First, infrastructure investment is needed because the global population is expected to rise to around 9 billion by 2050, and almost all of this population increase will be in the cities of the developing world. Many of these cities contain vast slums and shantytowns of self-built homes; they have never been “modernised” in terms of transport, energy, water and communications systems. Many of their people are very vulnerable to the weather disasters that are expected to accompany a changing climate.

Second, most developed and developing countries have not kept up with infrastructure maintenance over the past few decades, and much stock is deteriorating. For example, a 2009 report by the American Society of Civil Engineers gave US infrastructure a failing grade and estimated \$2.2 trillion would need to be spent over the next five years to bring it up to an acceptable level.¹

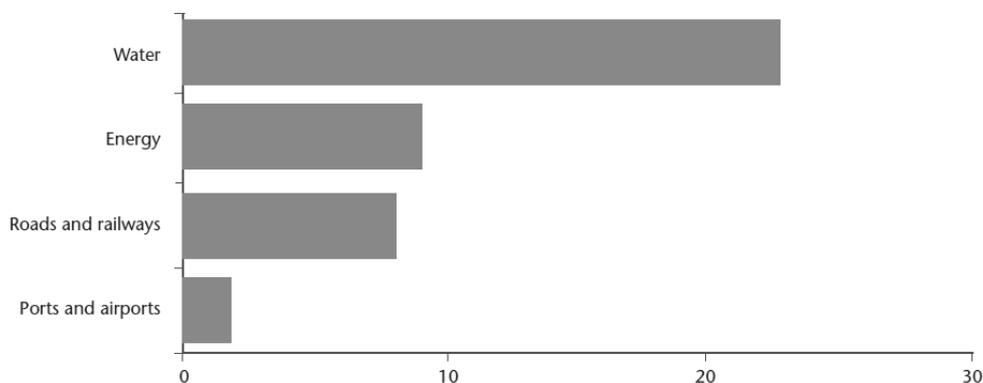
New technology will be required

Third, much new technology requires new infrastructure, and current societal challenges require much new technology. For instance, mitigating climate change calls for low-carbon or no-carbon energy and transport systems. Yet scientists warn that global society has already committed itself to major climate change and the sea-level rise and increased weather disasters associated with it. Thus, much infrastructure will need to be moved or strengthened. Water systems must be rebuilt and/or moved as water availability changes.

As Figure 1 suggests, at least USD 40 trillion will be needed for infrastructure investments globally in the coming 20 years for urban infrastructure alone.

Figure 1. Significant infrastructure investment needs

Investment requirements for urban infrastructure to 2030, in USD trillion



Source: Booz Allen Hamilton, *Strategy & Business*, no. 46, 2007 (from Booz Allen Hamilton, Global Infrastructure Partners, World Energy Outlook, OECD, Boeing, Drewry Shipping Consultants, U.S. Department of Transportation).

II. The perfect match

Tremendous business opportunity in the move toward a more sustainable world

It is widely agreed that the bulk of the investment to be made in buildings and physical infrastructure over the next 40 years will come from the private sector. A 2010 report by the World Business Council for Sustainable Development (WBCSD) found tremendous business opportunity in the move toward a more sustainable world, if business can get away from present business-as-usual approaches “and do what business does best: innovate, adapt, collaborate and execute,” including new types of collaborations with government.²

Call for new government/business collaborations

Given that USD 40 trillion does not seem a business-as-usual sort of figure, this paper suggests some innovations; it also calls for new government/business collaborations that foster the financing of new investment with monies held by the life insurance and pension sector.

Investment horizon of life insurance and pensions sector matches the infrastructure timescale

The life insurance and pension sector manages trillions of euros, dollars, pounds, etc. with the sort of long time horizon that suites the timescale required for steadily rebuilding infrastructure. After 10, 20 or even 50 years, the majority of pension and life-insurance funds are to be distributed as retirement income to the elderly. For a significant part of these funds, this sector naturally seeks long-dated assets to match its liabilities. These should be income-generating assets where the revenue stream is generated over a long period of time, as can be the case with infrastructure.

It would seem logical that the pension industry should – and sometimes it does – prefer real assets or real cash flows in order to assure a decent purchasing power for the millions of people who will have to rely on pensions sourced from it for a significant part of their retirement income. The industry does prefer a controlled-risk profile so that it, and those depending on it for their future wellbeing, can be assured that sufficient money will be available when the pensions are to be distributed.

Governments, on the other hand, have much more complex and diverse challenges to manage, including the daunting task of refurbishing and expanding infrastructure, and maintaining and expanding the public real estate, all done in an environmentally and socially responsible manner.

Infrastructure investments can promote economic growth, but capital is scarce

Properly done, infrastructure investments promote productivity and efficiency in both the public and private sectors and foster economic growth, while managing various environmental challenges. Trillions of any currency are needed; capital is scarce, and not all nations can tap the financial markets as easily as before the recent recession. However, the economic life of much of this infrastructure is usually on the order of several decades. Much of it generates a fairly stable, often inflation-linked income.

Infrastructure investments can be a perfect match for pension savings

Thus in theory, infrastructure investments are the perfect match to pension savings. However, in practice, the links between pension savings and such investments remain fragile and under-developed, and may even be moving in the wrong direction. This paper examines ways these links can be improved, but first it takes a look at the realities of the life insurance and pensions industry.

III. The life and pensions sector

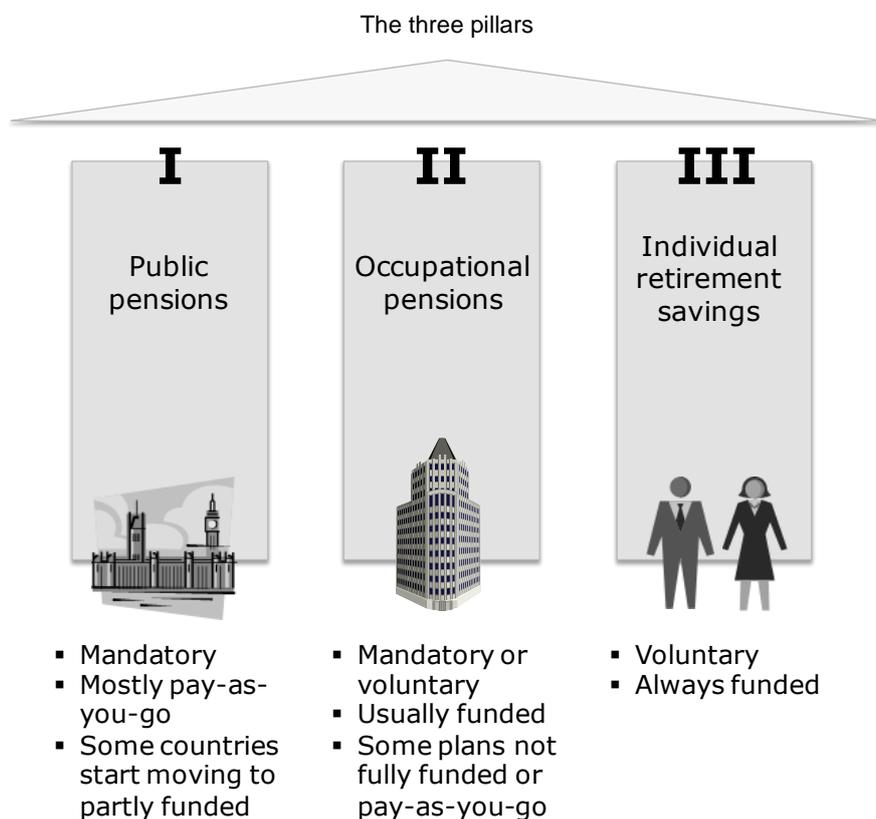
There is a very large pool of accumulated funds seeking high returns

The life insurance and pensions sector is in most countries characterised by growth, competition, large volumes of funds, and much detailed regulation. As more people have had the opportunity to save for their old age, or their employers have done so on their behalf – progressively so after World War II – there is a very large pool of accumulated funds seeking as high returns as possible, with controlled risk profiles.

Only funded pension plans have investable capital

Figure 2 describes the three pillars of most pension systems. Public pensions are usually unfunded, but not always. Only the funded portions tend to be included in pension statistics, as only these plans have investable capital. Occupational pensions are usually funded, but not always, while individual retirement savings are always funded, but may be accumulated through a format or in products not counted as “pension capital.”

Figure 2. Characteristics of the life insurance and pension sector



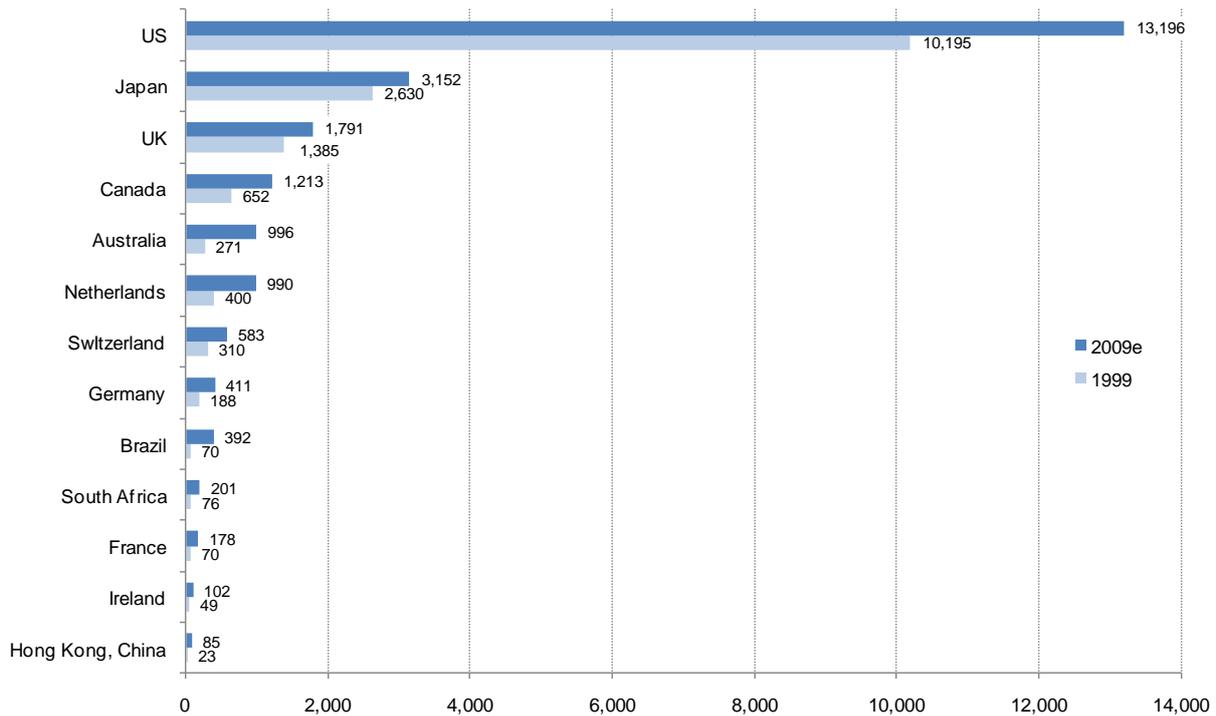
Source: Storebrand.

In an occupational pension plan, the average employee is about 40 years old, will retire in 20-25 years, and will receive payments for 20-25 years thereafter. The investment horizon for such plans is therefore intrinsically long, even after a plan becomes mature.

Figure 3 highlights the amount of pension assets, per-country accumulation, always with the caveat that comparison is difficult. The study that generated this figure looked at 13 countries, and found a total of some USD 23 trillion, about 70% of the GDP of the countries covered. The US is dominant, with other large OECD countries also toward the top of the list.

Figure 3. Global pension assets

Absolute and evolution 1999-2009, in USD billion



Source: Towers Watson, 2010 Global Pension Study, January 2010, page 12.

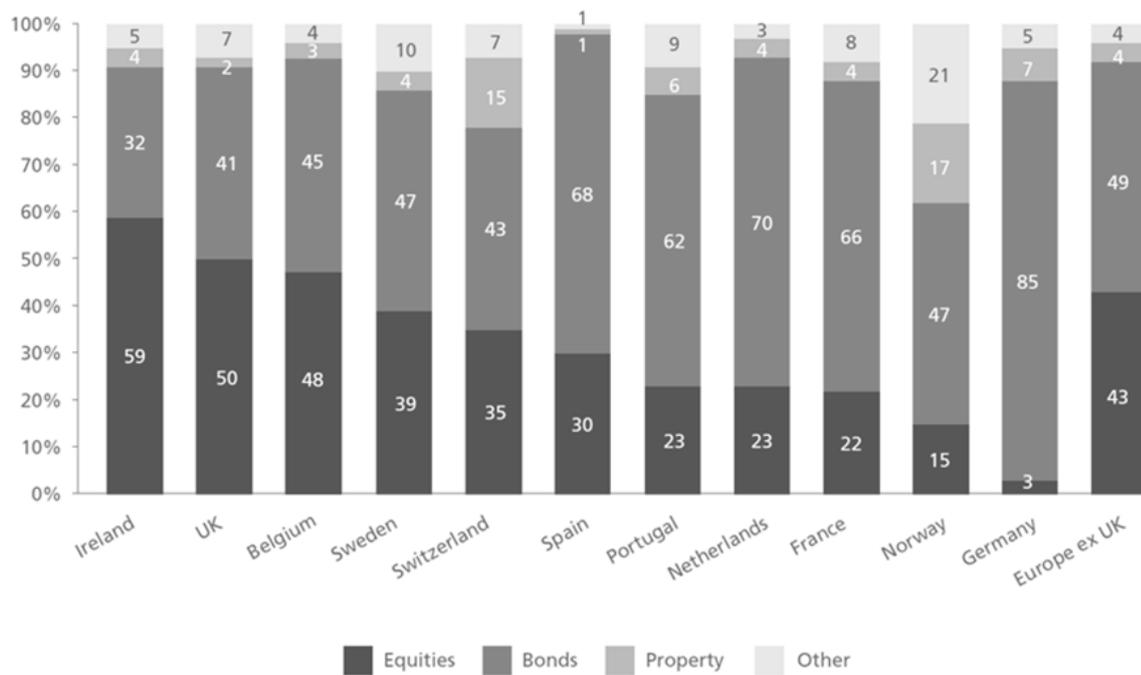
The investment profile of each pension plan is tied to a risk framework

Figure 4 shows that pension assets tend to be well-diversified over a number of broad asset classes. Internal guidelines and strict regulations ensure that no single risk becomes too large. The investment profile of each pension plan is usually tied to a risk budget or a risk framework in order to ensure that the entity will survive even the harshest of twists and turns that can reasonably be expected in the financial markets (the so-called *stress tests*).

Regulators and others have increasingly paid more attention to liability driven investments

In countries such as the UK and Ireland, strong equity allocations remain the norm, and they have been even higher in the past. These investments are expected to post higher returns over time than less-risky investments. They should therefore, over time, provide a higher pension for the beneficiaries or a less-costly pension plan for the sponsor. But the ups and downs of the equity markets can be severe, and they can continue for long periods of time. Therefore, regulators and others have increasingly paid more attention to aligning the characteristics of pension liabilities with the profile of the investment assets, an approach summed up in the term *liability driven investments*.

Figure 4. Asset class distribution in the life insurance and pensions sector



Source: Mercer, Asset Allocation survey and market profiles, European institutional market place overview, November 2010, page 5.

The majority of these liabilities are very interest-rate sensitive

After years of debate, most industry experts, academics, and regulators agree that liabilities can and shall be valued simply by discounting the cash flow of future pension payments. As the majority of these liabilities will be retained for a long period of time before being disbursed as pension benefits, they “belong” on the truly long end of the yield curve. Hence, their value is very sensitive to changes in interest rate levels, as well as to other changes in the yield curve. A sensitivity of 1:10 or 1:15 is quite common. As the discount rate decreases, the value – or the “burden” – of the pension liability rises. For example, a one percentage point decrease in the yield curve – and hence in the discount rate – increases the value of the pension liability by 10-15%.

Few investments can match this sensitivity

A significant fall in interest rates can have a dramatic effect on the sector. During the recession of 2008, the sector experienced about a 30% increase in the value of pension liabilities, caused by a 2 to 3 percentage point decline in long-term interest rates. Few investments, except long, liquid government bonds, can match a 30% increase in value over such a short period, and during a period of significant market turmoil.

Infrastructure deserves a higher standing in pension portfolios

Given that equities and other volatile investments raise problems for pension funds, and that truly long-dated bonds and other long-dated assets are few, infrastructure investments surely deserve a higher standing in the portfolio of any well-managed, properly diversified pension fund.

IV. Funding infrastructure

Infrastructure has many of the characteristics sought by pension fund managers

Public infrastructure and other public physical assets have many of the characteristics sought by pension fund managers. The economic life of the investments and the corresponding cash flows they generate – or can generate – are long. The quality of the payers of the cash flows is high, and if necessary, the recipients could have recourse to the physical entity. As noted earlier, huge amounts must be invested in the coming decades in urban water, energy and transport systems, but new investments will also be needed in rural areas to improve agriculture, provide it with water and protect it from extreme weather conditions.

Much of the investment is needed in the developing world

There is also the challenge that much of the investment will be needed in the developing world, while most of the pension capital to date has accumulated in the OECD economies. Thus, insurance asset managers will need to find ways to invest in public infrastructure in countries that have diverging regulations and risk factors.³

Infrastructure projects have operational risks

Another issue is that the construction period for infrastructure projects carries operational risks: cost overruns, technical difficulties, natural disasters, etc. Construction companies should deal with these risks, not the pension providers. Pension providers step in – or scale up – their investments when this risk is covered or when the construction period is over and the operating period has started.

Infrastructure and other commercial real estate raise environmental issues

Infrastructure and other commercial real estate raise environmental issues of all sorts, not least the fact that about 40% of primary energy use worldwide occurs in residential and commercial buildings, and more buildings are to be built over the next 30 years than have been built up to now. Barriers to the construction of “green buildings” are legion. Work by the WBCSD found that most developers do not understand how inexpensive it is to build energy efficient buildings.⁴ Also, incentives are often skewed, with developers encouraged to install the cheapest, least-efficient heating and air-conditioning systems, as the higher costs of operating these systems is usually passed along to buyers or renters. Also, the cost of ecosystem services remains outside of all accounts, from those of construction companies to those of nations.

What can be done to reduce energy use

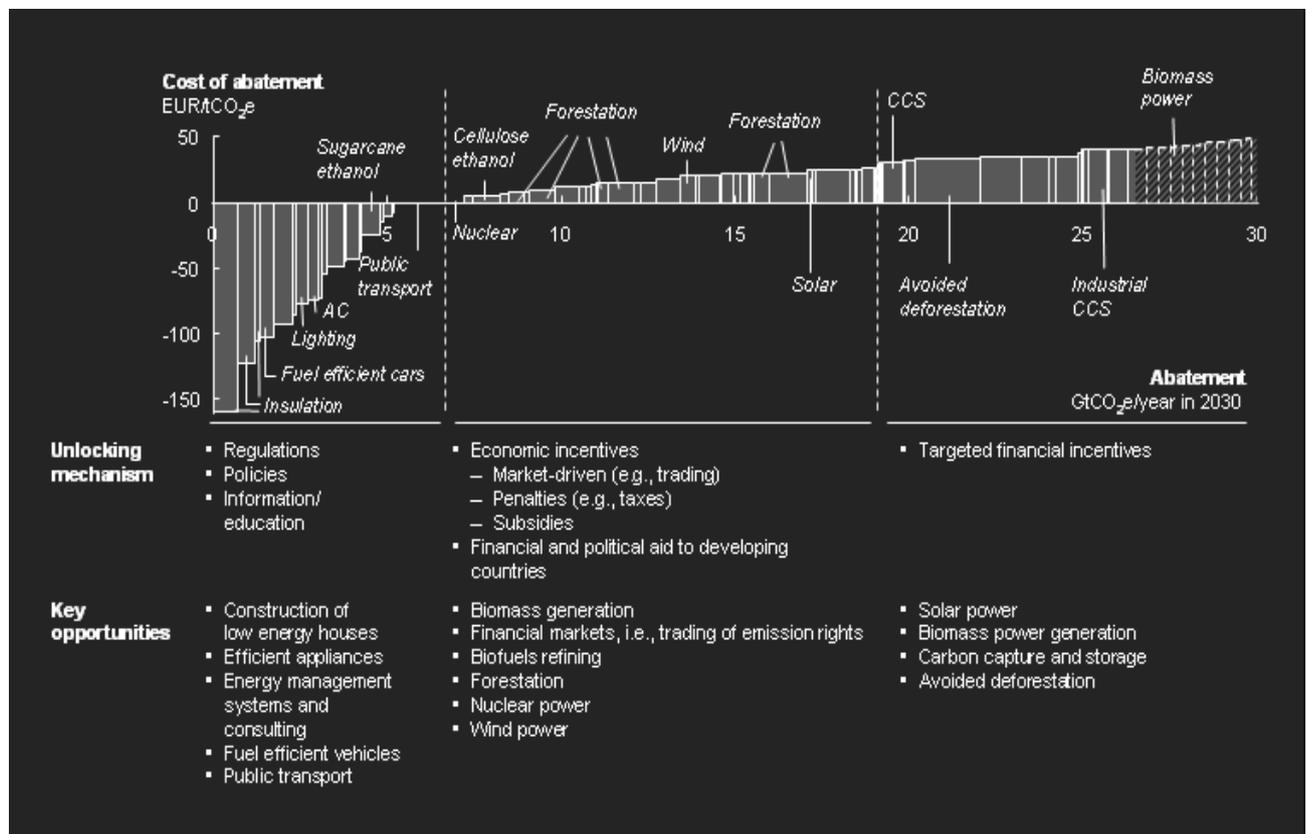
The WBCSD estimated that energy use in buildings could be cut 60% globally by 2050 if six major recommendations are followed:

- Strengthen building codes and energy labelling for increased transparency.
- Use subsidies and price signals to incentivise energy-efficient investments.
- Encourage integrated design approaches and innovations.
- Develop and use advanced technology to enable energy-saving behaviour.
- Develop workforce capacity for energy saving.
- Mobilise for an energy-aware culture.

Technology for low-carbon energy efficiency largely exists and can be used to save money

Not only does the necessary technology largely exist for low-carbon energy efficiency, but using it can save money. Below is the well-known but somewhat controversial map of carbon abatement opportunities from a report by the McKinsey Global Institute.⁵ Activities on the left-hand side of the curve are expected to have higher incomes than costs, with current known technologies in areas such as insulation, lightning and air conditioning. Governments need to impose stricter regulations and building codes on all new entities to be built, and after some time extend the restrictions to all existing physical stock. Technologies will have the time needed to move down their efficiency curves and make the cost of environmental upgrades affordable for the existing stock. One can imagine buildings needing an environmental certificate before titles can be transferred.

Figure 5. Investment opportunities from climate change as identified by analysing the CO2 abatement cost curve



Source: McKinsey&Company, Impact of the financial crisis on carbon economics, 2010.

Investments in new technology are risky

It is also true that direct investment in innovative, early stage technology is risky and must be treated as such. Public subsidies, therefore, are often used to encourage new technologies.

Public guarantees to attract private capital

There is a long tradition of public bodies guaranteeing a certain risk level for an infrastructure project; with that guarantee in place, capital providers such as pension funds can scale up their investment so the infrastructure can be built.

World Bank agreement as example

In June 2011, the World Bank signed an agreement with the mayors of 40 of the world's biggest cities, in both developed and developing countries, to work on technical and financial assistance for projects to minimise the effects of climate change. World Bank President Robert Zoellick said that the deal would give mayors' access to the Bank's climate investment funds, totalling USD 6.4 billion in 2010, and he hoped this money could attract as much as USD 50 billion in private capital. The deal would also provide standard approaches to minimising climate risk and standard ways of measuring urban greenhouse gas emissions.⁶

Mandatory contributions by the buyers of housing infrastructure is another approach

Another approach, one that may be particularly appealing to the pension sector, is to require mandatory contributions at the time of new construction, for apartments, for example. The purchasers of the new dwellings would have to provide a mandatory contribution for their housing infrastructure, and pay a certain ongoing fee thereafter. The remaining part of the capital could come from capital providers such as pension funds, which would then be entitled to the ongoing periodic payments. Pension managers could then add to the size of the total investment, perhaps making possible the construction of new sewage or clean water systems.

V. Toward a more perfect match

What keeps pension fund money away from infrastructure investments?

Structured deals that shorten the investment horizon of infrastructure investments limit the participation of pension funds

One impediment is that the investment banks and others structuring the infrastructure deals tend to shorten the investment horizon of infrastructure investments so that they do not facilitate access to truly long cash flows. For example, this is seen in the United States, where many infrastructure investments come to market in the legal format of a fund – often a dated fund (one with a specific time horizon). When structured this way, the investor gets the upside and downside of valuation changes, but does not get the benefit of the long-term cash flows provided by the infrastructure. Packaging the investment this way makes it compete in terms of asset allocation with private equity, not with corporate bonds, as it should. Pension capital can only participate as small partners in such transaction formats.

Solvency II to come into effect in Europe

In Europe, the regulatory regime of Solvency II is expected to come into effect on 1 January 2013. This is a new set of regulatory requirements for insurance firms that operate in the European Union; it sets up a single market in insurance and pension supervision while also improving consumer protection in case of insurance company or pension provider bankruptcies. The framework directive is in place; the Implementing Measures are about to be settled; and the more detailed Level Three Regulations are being worked out in parallel.

Solvency II penalises infrastructure investments

However, the regulatory details of Solvency II require that a significant part of insurance industry assets be invested in domestic-currency government bonds. That is because only government bonds are recognised as having a value change profile resembling that of insurers' liabilities. Corporate bonds are penalised significantly (through the need for significant capital to support the investment), and an even tougher capital requirement is placed on equity investments and the like. If infrastructure investments are categorised as "private equity", regulations require an excessive amount of capital to cover the relatively moderate risk of the infrastructure investment; the moderate returns typical of infrastructure investments are simply not high enough to support the unreasonably high capital requirements. However, if infrastructure investments were classified similarly to high-quality corporate bonds for regulatory purposes, then the capital required to back the investment would be much lower, and much more money could be invested. The modest returns would then be sufficient to offset the modest capital requirements. This is currently not the case.

Should regulation be this rigid?

For example, the capital requirements for investing in the long-term bonds of government-controlled entities, such as Infrastructure Ontario in Canada or Statnett in Norway, are much higher than for the corresponding government bonds of these countries. In this context, only supranational organisations like the International Finance Corporation or the World Bank can match a government issuer. Should regulation be this rigid?

Lengthening the regulatory horizon for capital efficiency would help

The economic life span of the physical infrastructure is often 40-60 years, but the capital efficiency of the entities borrowing funds for these investments is often measured on much shorter time spans. The fact that these institutions typically issue debt for shorter time horizons than the economic life of the underlying asset means that refinancing is required. Lengthening the regulatory horizon for capital efficiency would help. And access to the underlying asset also makes the investment opportunity more attractive for pension capital.

Capital requirements for infrastructure investments should take better account of underlying assets

If debt – for example in the form of bonds – is issued by government-controlled entities, like Infrastructure Ontario or the Norwegian power grid provider Statnett, then a formal credit rating is the basis for assigning how much capital is needed to support the purchase of bonds issued by these organisations. Mechanisms need to be developed to acknowledge that these institutions have access to the underlying asset (as in a covered bond); as a result, they should be able to finance their infrastructure activity with much lower capital burden for the pension investor.

Something fundamentally wrong in current approaches to valuation

The bottom line is that there is something fundamentally wrong in how pension liabilities are valued. Pension liabilities are to be paid out decades from now, yet they are valued based on the prevailing spot curve for essentially government bonds or swap quotations on any given day, and this is the basis for determining whether an institution is sufficiently solvent. During the recession, many entities in the pension and insurance sector felt they were solvent at breakfast, insolvent at lunch, but solvent again at close of business, or only a few days later.

Smoothing mechanisms so that long-term liabilities could better match longer-term, high quality investments

Assessing the value of truly long-term liabilities should require the acceptance of a variety of stabilising or smoothing mechanisms that would enable the participation of the long-term investors that governments are seeking. Perhaps the value-change profile of liabilities needs to move a bit more slowly; and with some careful consideration, longer-term, high-quality assets such as infrastructure investments could be valued through a mark-to-model system so that their profile could more closely match that of the liabilities.

This would be a significant step forward in enabling pension providers to act as long-term investors, absorb long-term risk, and even have the potential to act counter-cyclically when the next crisis hits the markets.

“Regulated Asset Base” model to encourage infrastructure investment

Martin Stanley similarly argues in this issue of *Financial Market Trends*⁷ that infrastructure can be a good investment for pension funds. However, encouraging such investment would require governments to promote a “Regulated Asset Base” model to improve capital expenditure and to avoid undue solvency rules and other regulatory obstacles to long-term investment. He further maintains that governments should avoid crowding out private-sector investment, confining interventions to projects where public risk-sharing is necessary, and refrain from making frequent short-term changes to the regulatory framework.

Securitisation of social infrastructure

There are good examples out there that can be built upon. Britain has a long tradition of securitising social infrastructure, whereby the riskier parts are treated as such and the less risky, the majority of the funds, are issued as high-quality bonds.

Communication is important to promote public-private partnerships

There is too little communication and co-operation between public regulators and finance ministry officials on the one hand, and the pensions and insurance sector on the other. Communication is important, because the problems in so-called public-private partnerships (PPPs) for infrastructure tend to be more psychological than logical, in the sense that government officials and business people usually have radically different mindsets. Communication can bring them closer together so that effective cooperation can follow. Interaction is especially important between the leading entities in the public or private sectors because progress is best made at this level. There is a vast difference of mindsets between leaders and laggards in these issues.

Infrastructure Ontario as example

Infrastructure Ontario, a “crown agency” (government organisation) that operates at arm’s length from the government, was established in 2005 to – among other things – facilitate such communication, creating consortia to design, build, finance and maintain government buildings, roads and transit systems. It has “closed” on 29 projects – that is, raised the money and begun construction – and has completed about a dozen.⁸

A growing number of pension funds have been investing in PPPs

Infrastructure Ontario, modelled on the British public-private partnership approach, allows consortia to bid on highly detailed, fixed-price, date-certain projects, transfers virtually all risks to the winning consortium, and then allows it to raise the capital required, the capital usually being about 90% debt and 10% equity. The consortium is then paid annual service payments for the next 30

years or so. Pension funds are usually looking for higher returns than the 11% these projects usually earn, but over the past year or so a growing number of pension funds – both public sector and private companies – have been investing in such projects to manage their portfolios and because of the long-term guaranteed returns. However, the new interest shown by the pension funds is largely because Infrastructure Ontario has been communicating with them.

Norway recently passed legislation targeting investments in infrastructure

Norway passed legislation in December 2010 allowing a separate allocation for direct investments in physical infrastructure of national importance. The investments must yield a long, stable, and predictable cash flow. The regulatory details have yet to be worked out, but a strong political signal has been sent.

Co-operation, coordination and government leadership are required

The examples of progress suggest that a more perfect match can be created, but it may require co-operative efforts and coordination between public bodies, and between those public bodies and the private sector, and even among businesses – rarely, if ever, seen before. It will also require that governments demonstrate leadership and establish guiding principles, that they let the market mechanisms work within the guidelines established, and that they encourage the more effective use of existing technologies while stimulating the development of new technologies.

Rebuilding the infrastructure of our civilization over the coming four decades will require a great deal of new thinking, investing, regulating, and doing business. The opportunity to use the wealth of pension funds as part of these innovative approaches must not be missed.

Notes

1. American Society of Civil Engineers (2009).
2. World Business Council for Sustainable Development (2010).
3. This paper does not presume to offer an answer to that issue.
4. World Business Council for Sustainable Development (2009).
5. McKinsey Global Institute (2008).
6. Barrionuevo (2011).
7. Martin Stanley is Global Head of Macquarie Infrastructure & Real Assets, and Senior Managing Director, Macquarie Group; see his article “Investing in Infrastructure: Getting the Conditions Right” in this issue of *Financial Market Trends*.
8. Pers. Comm. with Paulette Den Elzen of Infrastructure Ontario, June 6, 2011.

References

American Society of Civil Engineers (2009), *2009 Report Card for America's Infrastructure*, available at <http://www.infrastructurereportcard.org/report-cards>

Barrionuevo, Alexei (2011), "World Bank to Help Cities Control Climate Change," *The New York Times*, June 2.

Booz Allen Hamilton (2007), *Strategy & Business*, no. 46.

McKinsey Global Institute (2008), *The Carbon Productivity Challenge: Curbing Climate Change and Sustaining Economic Growth*, New York: McKinsey and Co.

McKinsey&Company (2010), *Impact of the financial crisis on carbon economics*.

Mercer (2010), *Asset Allocation survey and market profiles, European institutional market place overview*, November.

Towers Watson (2010), *2010 Global Pension Study*, January.

World Business Council for Sustainable Development (2009), *Transforming the Market: Energy Efficiency in Buildings*, Geneva: WBCSD.

World Business Council for Sustainable Development (2010), *Vision 2050: The New Agenda for Business*, Geneva: WBCSD.