



Financial Market Trends

Focus on

- Private Equity: What's Behind the Boom?
- The Rise of Hedge Funds and Structured Products

Financial Market Trends

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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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Foreword

Financial Market Trends provides a six-monthly update of trends and prospects in the international and major domestic financial markets of the OECD area and beyond. Timely analysis of and background information on structural issues and developments in financial markets, focusing on areas where changes are most substantial, make this publication relevant for financial market participants and policy makers alike, and should stimulate discussion among experts.

The current issue features the boom in private equity and the rise of hedge funds. It also contains articles on:

- *Current issues in financial markets;*
- *retail instruments and structured products;*
- *ageing, longevity risk, and pension fund investment challenges;*
- *housing markets and mortgage debt; and*
- *emerging markets in Africa.*

This issue is the first of a new series with a new “look and feel” and a new publication schedule. Individual articles will now be released online as soon as they are available, while the entire volume and print version will continue to be published biannually. Information on each article and each six monthly publication will be available at www.oecd.org/finance and subscribers can order and download articles and full issues of the book at www.sourceOECD.org/periodical/fmt.

We hope this new format of Financial Market Trends will better serve our readers with more timely information and analysis.

Comments and questions should be addressed to the Financial Affairs Division of the OECD Directorate for Financial and Enterprise Affairs (e-mail: fmt@oecd.org).

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The cut-off date was 22 June 2007

Part I

Current Issues in Financial Markets

Financial Markets Highlights

*May 2007**

I. Desynchronised growth, liquidity and ‘Goldilocks’ continues

Markets have recouped their losses following the February correction

There was a sizeable correction in financial markets in February. However, since then all of the reflation trades have returned: equities have recouped their losses to the end of April; bonds yields have fallen and spreads have resumed their narrowing pattern; commodities have rallied along with commodity currencies; and the US dollar is weaker.

The recent market rally was helped by: (a) the Fed’s decision to go on hold for now; (b) the fact that there is no current sign of inflation excluding energy prices; and (c) the emerging desynchronised pattern of growth, which is a comfort factor that this can continue into the future – ‘Goldilocks’ is still here after all.

Lending standards are beginning to tighten

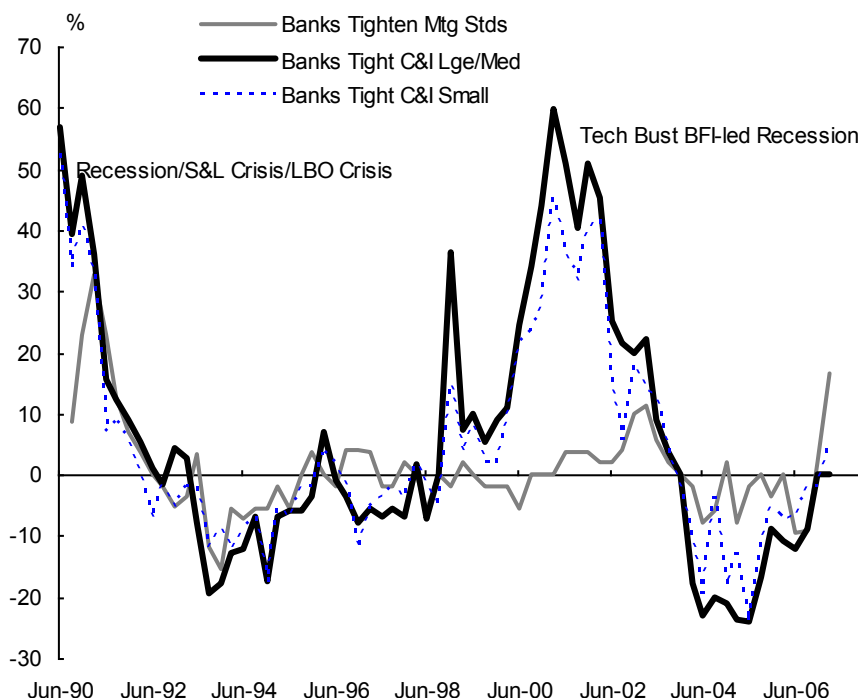
There are some minor negatives in the overall global economic situation, which are mostly concentrated in the United States – the housing slump and the likelihood of a slowdown in profit growth from currently very high margin levels are the main concerns in this regard. The US financial system is well capitalised and flexible enough to absorb the credit losses from the sub-prime fallout, so the real question is whether this event leads to a more general tightening of credit standards. Such a pullback in risk taking is beginning to happen, particularly for mortgages

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(see Figure 1), and is healthy from a financial stability perspective. But this does imply tighter monetary conditions for a given level of the Fed Funds rate, and it could prolong the period of slower growth.

Figure 1. US banks tightening lending standards: mortgages & C&I loans

Net percentage of banks tightening



Source: Federal Reserve, Senior Loan Officer Opinion Survey on Bank Lending Practices; Thomson Financial Datastream.

Desynchronised growth reinforces the perceptions of low inflation risk in financial markets

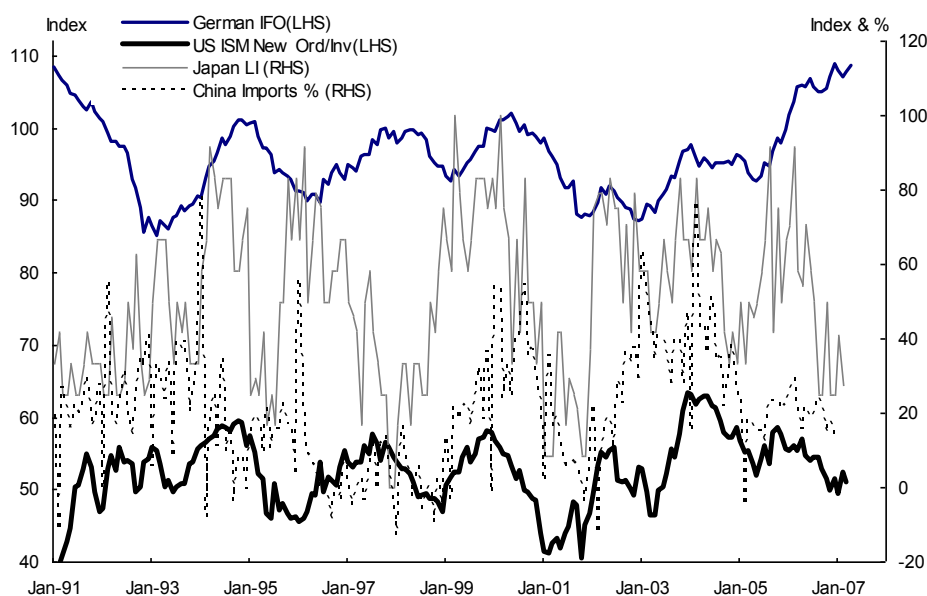
The world economy is quite desynchronised at present. The US slowing is being offset by stronger momentum in Europe and very strong growth in emerging markets, led by China and India. Even in Japan, which continues to lag, the news is not all bad. Figure 2 shows a selection of regional lead indicators – the IFO in Germany is particularly strong as the US weakens. This is a healthy

backdrop for financial markets. As a consequence, equity markets, underpinned by ample global liquidity, have continued to rally quite strongly.

***Sound fundamentals
vs. excessive liquidity***

However, **there are two schools of thought on the financial situation from here:** (i) that policy has done such a good job in causing economic volatility to be low, that there are no major excesses, and none of the cycles in asset prices seen to date reflect unmanageable bubble patterns – so while the markets climbed the ‘wall of worry’ in February the outlook justifies some exuberance; or (ii) that the excess liquidity is moving around from one market to the next: first real estate prices and now equities. Eventually the cost of capital will adjust up, via higher spreads, and once this finally happens, asset prices will move down. Some levered players will be at risk in such a scenario.

Figure 2. Lead indicators: healthy desynchronised growth pattern emerging



Source: Thomson Financial Datastream.

The equity rally, following so closely on the heels of the housing boom-bust in the USA, is being driven in part by **the ready availability of liquidity**: the boom in private equity and the role of hedge funds in propagating narrowing spreads through carry trades (keeping the cost of capital down) is adequate testimony to this. When leverage plays a role in strong market developments, policy makers need to take notice – history teaches that these episodes often do end badly.

II. The sub-prime and related issues

No adverse contagion from sub-prime mortgage at this stage

There has been a lot written on the sub-prime issue of late, and **the general consensus seems to be that there are not going to be broad adverse contagion effects at this stage**. In contrast to the S&L crisis of the late 1980s and early 1990s, a lot of the balance-sheet risks were shifted from banks via credit risk transfer mechanisms and the securitisation process. Even if the exact identity of the final holders of the securities is less well known, this shifting of risk away from financial intermediaries reduces systemic risk – in fact 40% of the mortgage-backed securities are distributed outside of the United States.

This impact on banks affects revenue but is not a major credit event

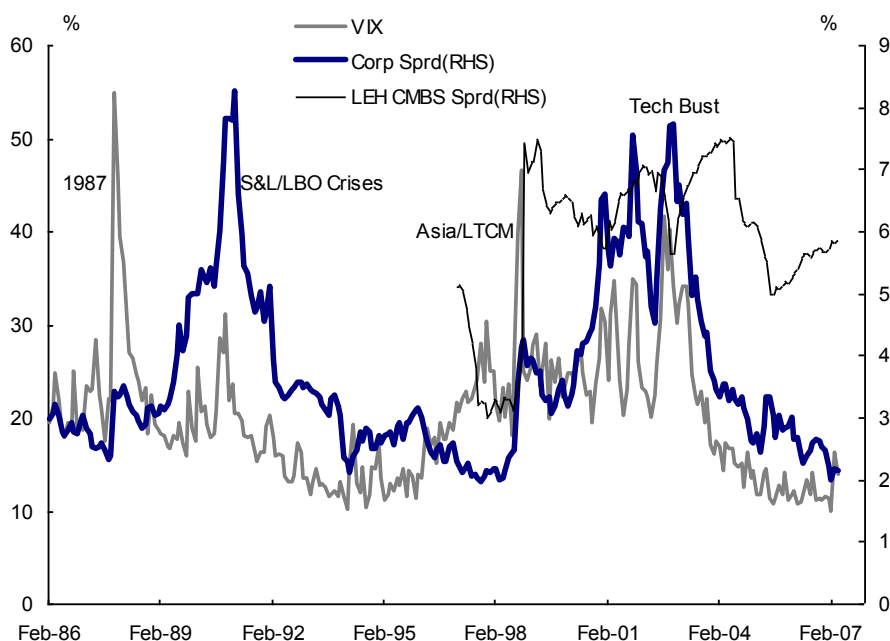
This view suggests that the sub-prime issue is not a major credit issue for banks. Rather it is one of revenue loss for exposed institutions – this conclusion is supported by recent US bank results, where only a few reported a material hit to revenues via write-downs on loan books in the sub-prime area. Some of the bank losses were related to (a) poor underwriting; (b) mortgage originators having some of the ABS products put back to them (due to the use of hitherto unnoticed covenants in their contracts with the originators); and (c) holding more inventory on their books than they wanted (e.g. because they could not get appropriate credit ratings).

Both demand- and supply-side factors are at work in slowing mortgage lending and, consistently, this has now spread to commercial real estate loans (median growth of the 14 largest providers slowed to 1.3% per quarter in 2007Q1, from an average of around 1.9% in 2006).

Markets
*discriminating
 between balance sheet
 risk sectors*

The market has been behaving as it should, *i.e.* discriminating between the real estate market and other sectors where balance sheets are stronger. In Figure 3, the rally in corporate spreads since 2003 has not been matched in the mortgage market.

Figure 3. High-yield corporate vs. high-yield mortgage spreads and VIX



Source: Thomson Financial Datastream.

Further
*rationalisation in the
 mortgage organisation
 industry likely*

The sub-prime crisis will likely result in further rationalisation of the industry. The reason for this is the significant excess capacity built up in the mortgage industry in recent years. Stronger players win market share and others exit from the industry. Inevitably this has led to some closures, and any further insolvencies will depend on the capitalisation of the firms concerned. Table 1 shows sub-prime and total originations from the main groups as at the end of 2006. Some of the weaker players with high sub-prime shares will undoubtedly exit. This is the normal streamlining and rationalisation that is required – it will include some moving away from exotic instruments and

fragmented suppliers that have characterised the market in recent years, as (a) regulatory reform and better official guidelines crack down on weak and misleading practices; and (b) higher spreads act to reduce demand in relation to excess supply.

These adjustments may happen smoothly from this point, but volatility cannot be ruled out: closures of sub-prime originators could be disruptive; and defaults may spread to other adjustable rate 'Alt-A' loans (where lower or no documentation makes it difficult to assess creditworthiness).

Table 1. Mortgage originators and sub-prime share (2006)

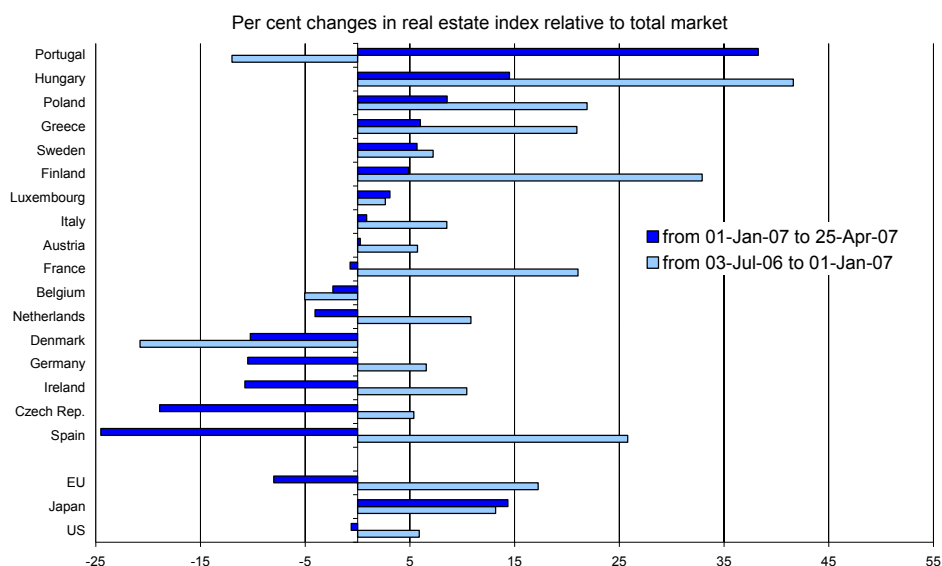
	Institution	Sub-prime \$bn	Market Share %	Total Mtg Orig. \$bn	Sub-prime Share %
1	HSBC	52.8	8.8	52.8	100.0
2	New Century	51.6	8.6	59.8	86.3
3	Countrywide	40.6	6.8	461.4	8.8
4	Citimortgage	38	6.3	183.8	20.7
5	Fremont Invest & Loan	32.3	5.4	32.5	99.4
6	Ameriquest	29.5	4.9	29.5	100.0
7	Option 1	28.8	4.8	35	82.3
8	Wells Fargo	27.9	4.7	396.1	7.0
9	First Franklin	27.7	4.6	27.7	100.0
10	Washington Mutual	26.6	4.4	195.6	13.6
11	Residential Capital	21.2	3.5	94.6	22.4
12	Aegis Mortgage	17	2.8	17	100.0
13	Accredited Home Lenders	15.8	2.6	15.8	100.0
14	BNC Mortgage	13.7	2.3	13.7	100.0
15	Chase Home Finance	11.6	1.9	172.4	6.7
16	American General Finance	11.5	1.9	11.5	100.0
17	WMC Mortgage	11.3	1.9	33.2	34.0
18	Equifirst	10.8	1.8	10.8	100.0
19	Novastar Financial	10.2	1.7	11.2	91.1
20	Ownit Mortgage Solutions	9.5	1.6	9.5	100.0
Top 10		355.8	59.3	1476.1	24.1
Top 20		488.3	81.4	1865.8	26.2
Total		600	100.0	2980	20.1

Source: Citi.

In recent weeks share prices in the US real estate sector have recovered somewhat suggesting that the crisis is moving towards an end (see Figure 4). Even HSBC with all of its sub-prime worries has staged a rally. There have already been strong bids for sub-prime assets by financial buyers (private equity, hedge funds, etc.) reflecting the lack of distressed asset opportunities, as well as by strategic buyers (banks and brokerage firms).

Bust situations arise when debt expands too quickly and excess capacity builds up on the supply side. Problems emerge when interest rates subsequently rise, reducing demand. How this unfolds in the event of any higher rates in the EU needs to be monitored.

Figure 4. Real estate equity sector vs. the overall market



Source: Thomson Financial Datastream.

Are there latent excess issues in housing within Europe?

Residential mortgage debt has risen fast in some other countries as well, notably in Europe. Examples include the United Kingdom, Ireland and Spain. With the opening up of the property market to foreign investors and the benefit from lower Euro-area interest rates, Spanish house prices

have been strong (7% in the year to 2007Q1, down a little from 9.1% to 2006Q4). Housing debt is rising and competition among banks has driven them into the riskier segments of the mortgage market.

III. The liquidity issue and asset inflation risk

Global liquidity appears to be in plentiful supply

While the ‘air’ appears to have been taken out of the housing bubble for now, the strong rally in other asset markets suggests that global liquidity remains strong, and that real interest rates are perhaps too low. This encourages leverage, and private pools of capital have taken full advantage. As discussed in the other articles in this issue on private equity and on hedge funds and structured products, these pools of capital use leverage, both directly and implicitly through derivatives, to take advantage of opportunities presented by mis-priced assets. In this respect they play an important and positive role. It is important to distinguish these positive roles from the broader risks to which leverage may give rise if the global cost of capital is mis-priced as a consequence of excess liquidity. Market participants respond rationally to the signals they are given.

Attempts to fix financial prices always cause problems for liquidity availability

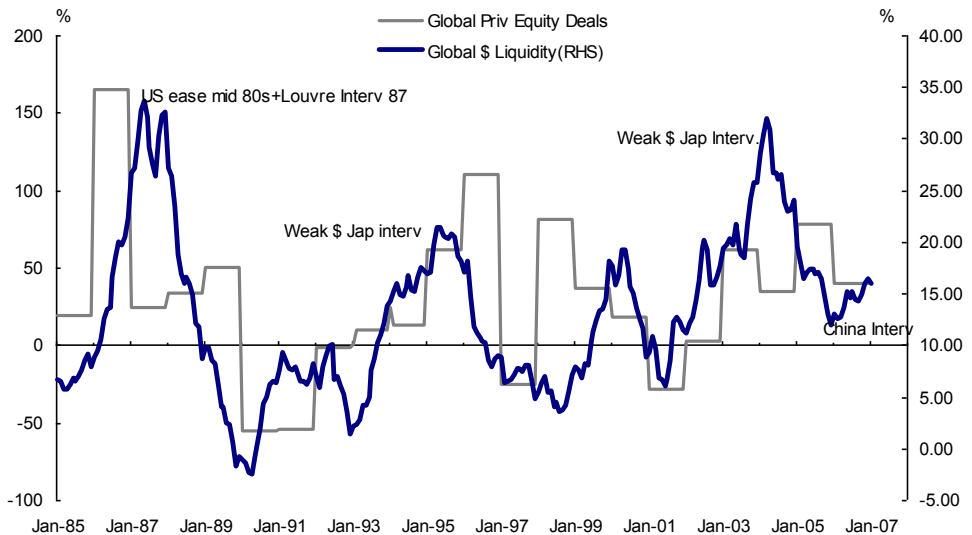
While policy has tightened in many countries, global liquidity remains plentiful as a consequence of attempts by some countries to fix the price of money; it is a basic economic principle that if one fixes the price of something (too low), one cannot control the quantity (too high). Tensions arise where policy needed for domestic purposes causes spillovers into global markets where innovative participants make use of it to move asset prices.

For example, in the 12 months to January 2007, China accumulated a further USD 259 billion in reserves by intervening to fix its exchange rate, and the stock of reserves stood at over USD 1.1 trillion. The recycling of these reserves into US bonds is a major factor keeping US rates low. At the same time the fixed exchange rate to the USD and the HKD affords all the usual mechanisms for avoiding capital controls (such as the failure to repatriate foreign currency receipts replaced by domestic loans). Within the Asian region, the ability fully to subscribe start-up investment vehicles quickly at present is well known.

Global liquidity cycles and private equity deal making have always been linked

Figure 5 shows a simple concept of high-powered global liquidity measured in US dollars (the main financial transaction currency). This is equal to US base money, plus the foreign exchange reserves of the authorities in China, Japan, Asia, the UK and the euro area – *i.e.* high powered money for the credit multiplier in the US plus international reserve accumulation outside the US which creates domestic liquidity. The US dollar assets are recycled into global (particularly US) debt instruments. **The correlation of global policy driven liquidity with the relative change in private equity deals is quite striking, and is frequently related to attempts to resist exchange rate pressure in some regions.** Debt accommodation is a fungible process and financing techniques are innovative: transactions can run quite independently of the domestic monetary policy of the country where the transaction is taking place.

Figure 5. Global liquidity and private equity LBO cycles

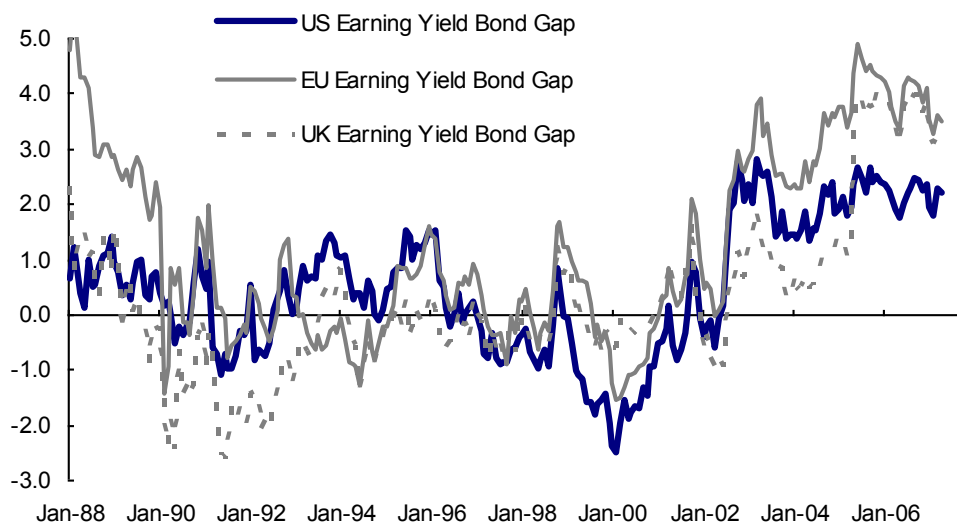


Source: OECD and Thomson Financial.

Chinese fixing of the RMB, while at the same time subsidising the price of energy within China, helps keep inflation low (as sterilisation policies via reserve requirement increases struggle to keep up). Cheap exported goods also help to keep global inflation low, enabling real rates globally to stay below normal. **Within Asia, real rates significantly below GDP growth represent a significant ‘subsidy’ to growth.**

While Japan has intervened less since the US dollar troughed in 2002, zero rates, necessary to counter domestic deflation concerns, continue to contribute to the global liquidity and spread trades via derivatives that are difficult to measure through standard bank balance sheet flows.

Figure 6. Equity arbitrage opportunity



Source: Thomson Financial Datastream.

*Liquidity opens up
arbitrage
opportunities that
financial markets will
take advantage of*

The combined effect of such policies creates a **massive arbitrage opportunity: to borrow at low rates and buy higher yielding assets**. Carry trade activities by hedge funds reinforce the downward pressure on yields. Equity LBOs are a part of the same arbitrage process.

This is potentially an inherently destabilising issue, because equity prices have to be driven to the point where yields are equalised. If the cost of capital globally is too low, then equity prices will rise too far. Figure 6 shows the arbitrage opportunity as it pertains to the booming equity markets. The equity yield-bond yield gap is historically as wide as it has been.

In short, markets will take advantage of excess liquidity until inflation breaks out in one form or another (in commodity prices or equity markets in the first instance).

IV. The February correction seen in this light

"Think of a ruler held up vertically on your finger: this very unstable position will lead eventually to its collapse, as a result of a small (or absence of adequate) motion of your hand or due to any tiny whiff of air. The collapse is fundamentally due to the unstable position; the instantaneous cause of the collapse is secondary."

(Didier Somette, *Why Stock Markets Crash*)

*Markets are likely to
remain 'jittery'*

As the quote suggests, the February correction was nothing more than a shake-out of the excesses that have been building up in an extremely overbought market (*i.e.* normalisation of risk aversion). The sell-off was attributed by some to fears of the introduction of government measures to cool down the A-share market in China. This is a market largely closed to outside investors and tends to trade irrespective of other markets (and vice versa). So the 'contagion' of jitters in the A-share market to the Asian and global markets would be a historic first. The sub-prime crisis in the US was also alluded to as a cause. Both the A-share market collapse and sub-prime issue were mainly excuses for overbought global markets to take profits, and for risk aversion to attempt some normalisation.

The rise in volatility shown in Figure 3 is not even back to historic norms. Spread and carry trades have resumed, and the equity markets have now made up all of their losses.

How inherently unstable in the longer run are the liquidity and leverage trends?

The extent of the next setback in the markets and its immediate triggers will not be as important as the fact that the present situation has elements of instability in excess liquidity that is difficult to control and leverage that is taking advantage of it. Further sub-prime issues; a major LBO or hedge fund credit event; defaults of the securitised CDOs that pension/insurance funds and hedge funds have happily bought; signs of actual inflation; or a strengthening of the yen (driven by a rally in domestic assets) causing the yen carry trade to unwind, could all be potential triggers for the next bout of volatility.

Are the capitalisation and credit assessment practices strong enough?

If the sources of global liquidity creation cannot easily be controlled, it is all the more important that financial institutions and levered market participants remain aware of the risk. Adequate capitalisation is important, and strong credit assessment practices need further encouragement.

*Update on Financial Market Developments**

I. Equity markets continue to be buoyant

After a major sell-off in February, markets have recovered at different speeds against a backdrop of rebalancing growth

Triggered by sub-prime and Shanghai stock exchange volatility, major stock markets suffered a significant correction at the end of February. Markets have since recovered and European markets have over the past few weeks more than compensated these losses (Figure 1). While another downturn on the Shanghai exchange end of May led to some increases in volatility on major markets, they have so far not altered their course.

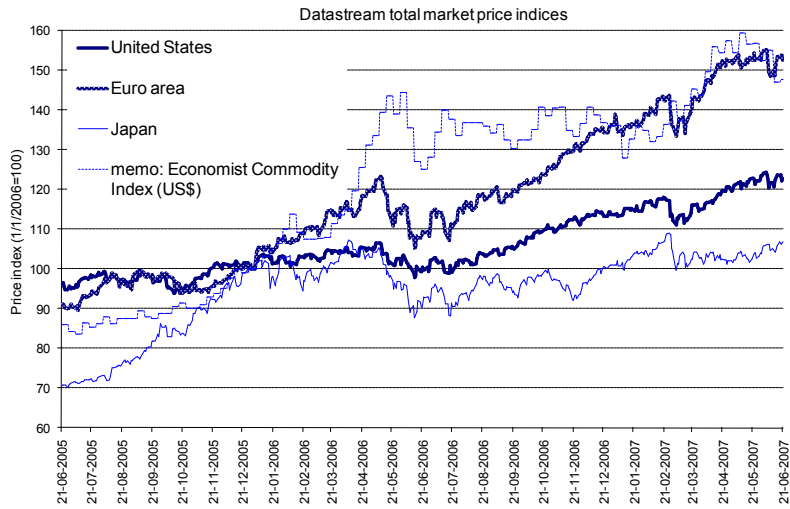
The strong recovery of markets, strength in commodity prices and currencies (AUD and CAD, Figure 2), despite the concern about sub-prime issues in the United States, broadly reflects the rebalancing of growth across OECD economies. While the US economy is slowing, activity in Europe is gathering strength; Japan is on a solid trajectory; and there is also a strong momentum in emerging markets, led by China and India, which add to the building blocks of a rather robust global economic environment.

Financial market volatility has remained contained

Volatility on major markets has increased after the February downturn (Figure 3), reflecting heightened uncertainty about the economic outlook in particular in the United States. Most of this uncertainty has been related to the distress in the US sub-prime mortgage market.

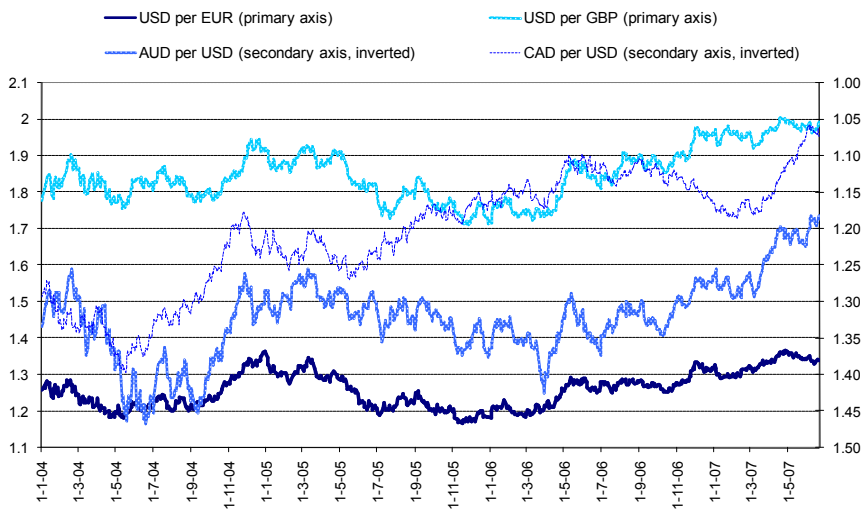
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Figure 1. Major equity markets developments

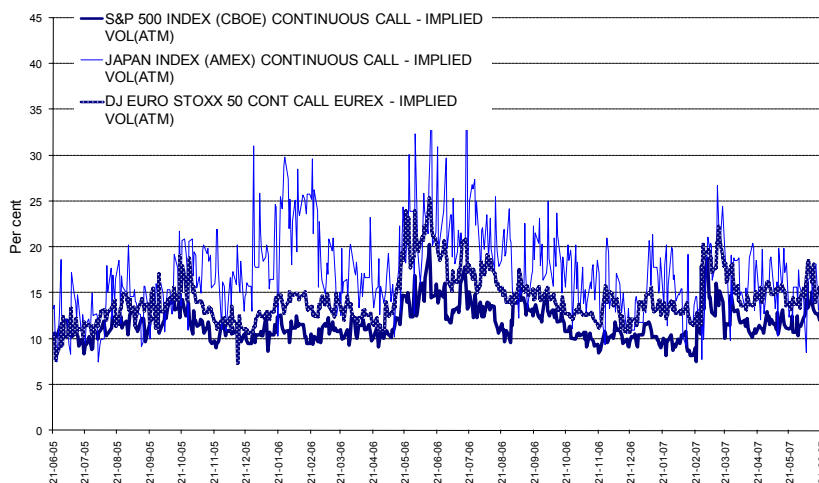


Source: Thomson Financial Datastream.

Figure 2. Selected major currencies against the US dollar



Source: Thomson Financial Datastream.

Figure 3. Implied volatilities of major equity markets

Source: Thomson Financial Datastream.

Despite some uncertainty, investors have remained confident

However, both equity and bond market volatility have remained below levels experienced during the May/June 2006 downturn, and the increases in the wake of the February downturn have subsided. As well, from a longer-run perspective, the equity market volatility has not climbed much beyond historical averages (measured, *e.g.*, since 1990), and bond market volatility has broadly continued on a declining trend, despite some recent increases.

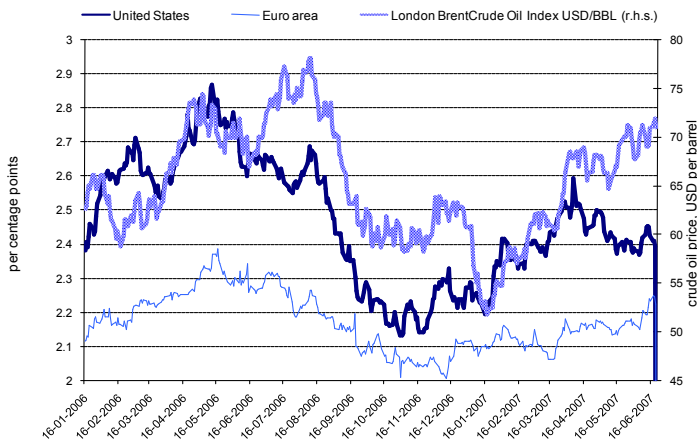
Overall, these developments indicate that, despite some uncertainty and expectations of a change in the interest rate cycle, investors have remained broadly confident as the search for yield continues.

II. Bond markets and interest rates embed investors' optimism

Expectations of higher inflation have somewhat ebbed...

While oil prices remain a risk and have, since April, substantially fluctuated and risen again from an 18-months low in January, they are hardly expected to attain previous records levels such as those of last summer (Figure 4).

Figure 4. Implied inflation expectations and crude oil price

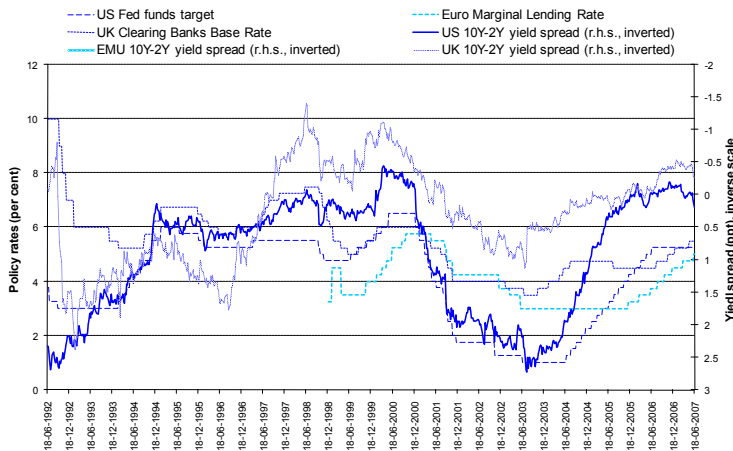


Note: Implied inflation expectations ("breakeven inflation") are differences in yields between 10-year government benchmark bonds and inflation indexed bonds (Merrill Lynch government inflation-linked bond indices).

Source: Thomson Financial Datastream.

Figure 5. Policy tightening and yield curve flattening

United States, euro area and United Kingdom



Source: Thomson Financial Datastream.

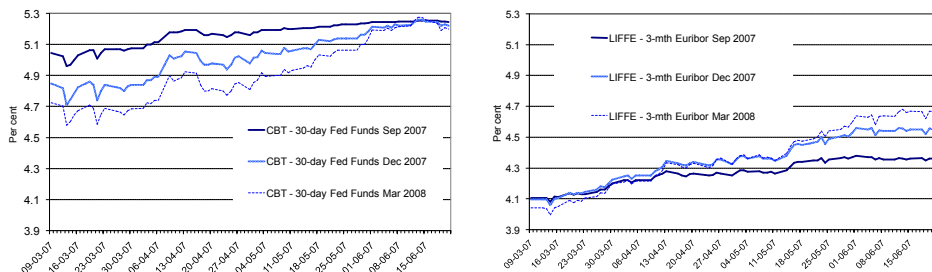
...but monetary policy makers remain vigilant

Inflation expectations have remained rather contained, despite the recent hikes. However, the effects of previous hikes have been showing up in headline inflation, a potential concern for monetary policymakers.

While major central banks have further tightened, interest rate increases at the short end had not been matched at the long end, and yield curves in major markets had flattened or turned negative (Figure 5). This pattern has often been interpreted as precursor for recessions, but global liquidity developments and continued strong foreign demand for US bonds may have rendered such interpretation of price signals irrelevant. However, while corporate spreads remain compressed, suggesting low risks, the bond market sell-off in June and the increases of major benchmark yields may signal the beginning of a turn in the interest rate cycle.

Figure 6. Short-term interest rate expectations: US vs. euro area

Expectations as implicit in future contracts on benchmark interest rates



Source: Thomson Financial Datastream.

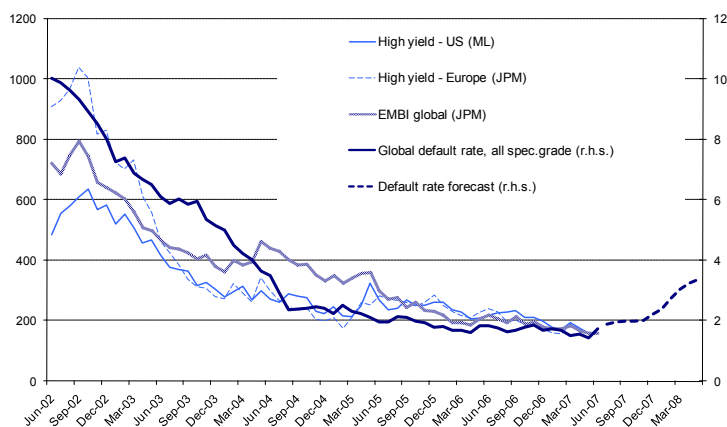
As news about the US economy have been on the upside recently, previous expectations that the Fed would accommodate sub-prime concerns and a softening economy have calmed (Figure 6). In the euro area, the ECB is expected to tighten further as the economy strengthens.

High-yield and emerging market bond spreads remain low

Prevailing optimism seems also to be reflected in other markets. With global liquidity still abundant, corporate and emerging markets spreads have remained low, and the end-of-February market downturn seems not to have had lasting effects in these markets (Figure 7). Corporate balance

sheets remain strong, and earnings are forecast to be robust, albeit some slowing is expected for US corporates, and global default rates are forecast to increase.

Figure 7. High-yield and emerging market bond spreads vs. default rates



Source: Thomson Financial Datastream.

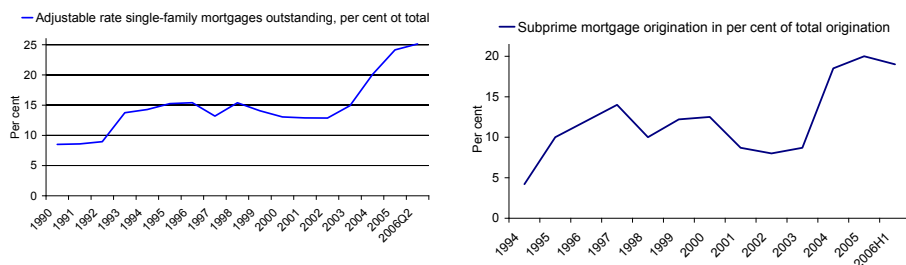
III. Mortgage markets have introduced risks

Ample liquidity has favoured mortgage lending to riskier borrowers

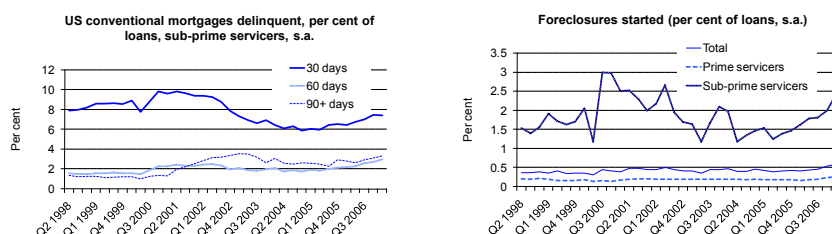
Sub-prime delinquencies and foreclosures have risen

A long phase of low interest rates has not only favoured leveraged finance, but has also boosted mortgage lending. Taking advantage of low interest rates, variable rate borrowing has increased, and non-traditional loans and less stringent borrowing requirements have increasingly extended credit to riskier borrowers (Figure 8).

While “teaser rates”, deferred payments and low initial amortisations made mortgages look more affordable, many borrowers are now facing payment shocks from interest rate resets (about half of the outstanding ARMs are estimated to be reset in 2007). With interest rates rising, borrowers have suffered. Delinquency rates among sub-prime borrowers have increased substantially, and foreclosures lead to an oversupply in certain housing segments (Figure 9). Falling collateral prices put mortgages with higher loan-to-value ratios at risk.

Figure 8. US mortgage lending developments

Source: Office of Federal Housing Enterprise Oversight (OFHEO); Mortgage Bankers Association of America (MBAA); Thomson Financial Datastream, Deutsche Bank Global Markets Research.

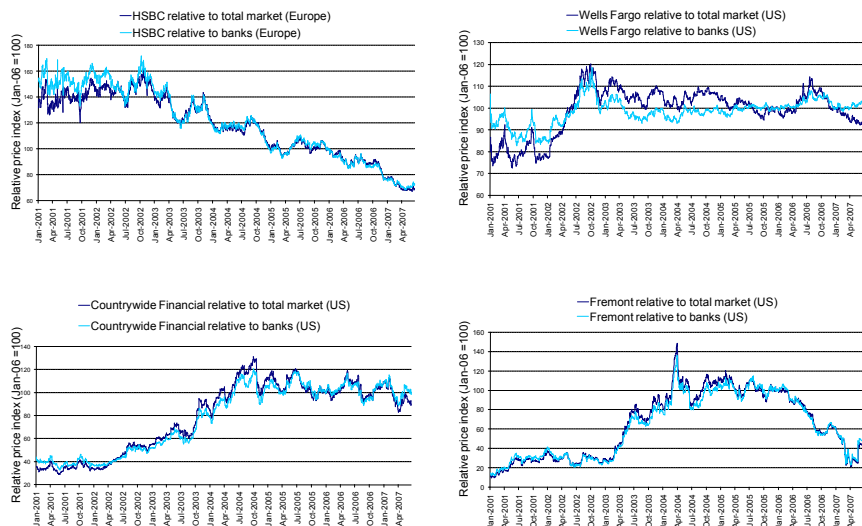
Figure 9. US sub-prime mortgages borrowers in distress

Source: Mortgage Bankers Association of America (MBAA); Thomson Financial Datastream.

Borrowers' distress has also impacted mortgage lenders

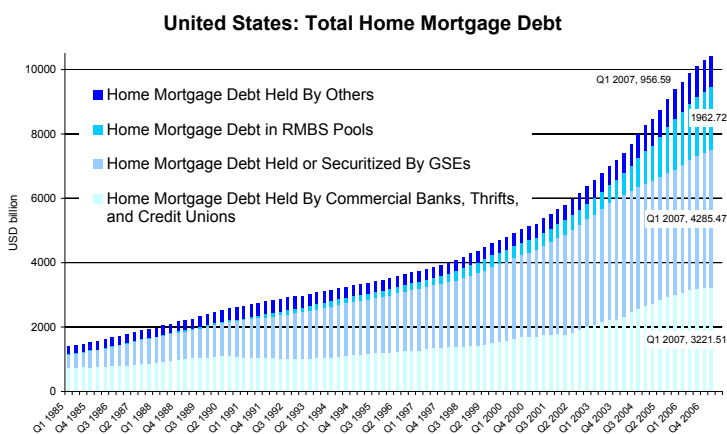
As default rates among sub-prime borrowers have increased substantially, a number of sub-prime lenders have been filing for bankruptcy. March 2007 figures by the US Mortgage Bankers Association show that 48 major US mortgage lenders, and 9 out of the 25 biggest sub-prime lenders, had gone bankrupt, shut down or ceased independent operation. The sector's difficulties are also reflected in share prices of listed sub-prime lenders (Figure 10). HSBC, for example, lost about half of the earnings of their Household Finance arm in 2006, and most institutions have now stopped or significantly reduced sub-prime lending.

Figure 10. Relative share prices of major mortgage lenders



Source: Thomson Financial Datastream.

Figure 11. Increasing securitisation of the US mortgage market



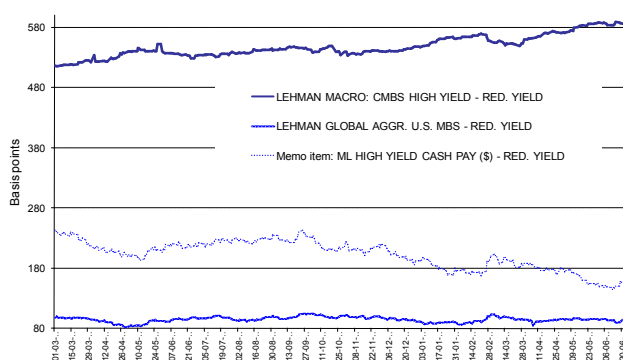
Source: Federal Reserve Board, Thomson Financial Datastream.

However, while institutions focusing on sub-prime lending have been facing severe difficulties, larger financial institutions – and the financial sector as a whole – seem to have weathered the sub-prime crisis relatively well, owing to healthy balance sheets and strong earnings in other areas of their business.

Mortgage securitisation has made risk transfer more efficient, but risks may remain hidden

Securitisation has increasingly enabled a transfer of risk to investors that are more able and willing to bear these risks (Figure 11). However, risks may not have been properly priced such that some investors may now feel overexposed to the high-risk tranches of the mortgage security market. The deterioration of the sub-prime sector is now showing up in increasing credit spreads of high-yield MBS, which have picked up more than 30 basis points since end of March (Figure 12).

Figure 12. Mortgage security spreads



Note: Yield spreads over US investment grade bond index yields, and over 10-year US benchmark bond yields for global US MBS.

Source: Federal Reserve, Senior Loan Officer Opinion Survey on Bank Lending Practices; Thomson Financial Datastream.

Sub-prime exposure of institutional investors seems not to be a major concern

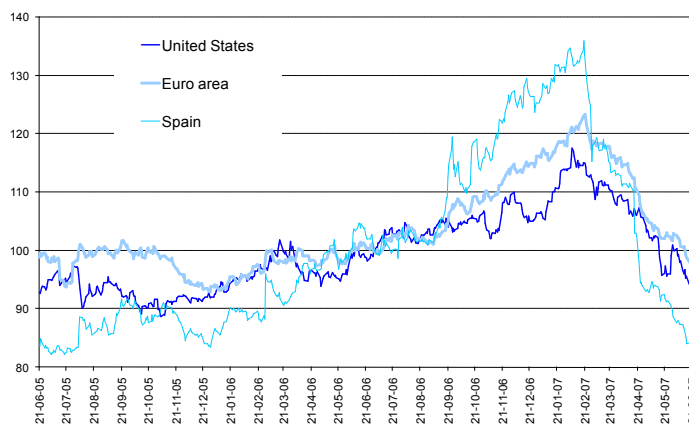
While detailed information on the holdings of mortgage securities is not readily available, there is evidence that institutional investors are holding the bulk of securitised mortgage debt – often pension funds, hedge funds and insurance companies in Europe. Credit risks for European insurance companies seem not to be a

major concern, however, as their exposure to the US sub-prime market is negligible. In many cases, exposure comes through US affiliates of these companies, and only a small part of MBS is held in below investment-grade vehicles. The main risk is that the crisis could have further to run, and may result in tighter lending standards reinforcing the slump in housing, with negative repercussions for the US economy.

Market action, however, so far suggests that this risk does not have a high probability. Hedge funds seem to have invested substantially in the high-risk segment of the sub-prime mortgage security market, and have been adding liquidity to the market during its downturn. M&A activity in the area is picking up, and some rationalisation in the industry will follow. This may better balance the structure of the mortgage market more in favour of the traditional mortgage model and providers compared to developments in recent years.

Figure 13. Real estate equity sectors: US vs. Europe

Real estate equity sector indices relative to total market indices



Source: Thomson Financial Datastream.

Correction in the US as well as European real estate sectors

There have been concerns that the US sub-prime crises could foreshadow similar developments in Europe. In Spain in particular, where the house price boom has

been very strong and the share of variable rate loans is high, falling house prices and rising interest rates could strain borrowers more than elsewhere. Major corrections are already being reflected in real estate sector share indices (Figure 13). While it is interesting to note that the boom in the industry has been more pronounced in Europe (and the euro area in particular) than in the United States, the sector's correction in Europe has followed the path of its US counterpart.

IV. The outlook remains broadly positive

Downside risks to the outlook

At the current juncture, it seems that some of the risks that had been previously present in investors' perceptions have ebbed. Fears related to geopolitical uncertainties, expectations of renewed oil price hikes, and risks of an abrupt adjustment to global imbalances have somewhat subsided.

Uncertainties remain however, notably over the economic outlook and central banks' reactions to inflation pressures. Implied forward rates are currently projecting long term rates in the US and Europe to rise slightly, and more pronounced in Japan, and there are expectations that the ECB and BOJ continue their tightening cycle throughout the year. USD weakness versus the RMB and some major currencies is likely to keep some downward pressure on interest rates and generally easy monetary policy in Japan and China. Ample liquidity has continued to be a driver of capital flows to emerging markets and other reflation trades evident in recent market performance.

While the next risk event may be difficult to predict, the longer markets rally and spread trades continue, the greater will be the potential for an even bigger correction than that seen in February, which could provide a greater test for policy. Candidates for a trigger might include: (i) inflation pressures; (ii) a major credit event (e.g. an LBO default); (iii) a rally in the yen, and carry trade reversal; and (iv) an unexpected sharp spike in oil prices.

Part II

Private Equity, Hedge Funds and Structured Products

An Overview of Hedge Funds and Structured Products: Issues in Leverage and Risk

Adrian Blundell-Wignall

With their high share of trading turnover, hedge funds play a critical role in providing liquidity for mis-priced assets, particularly when large volumes are traded in thin markets – thereby reducing volatility. This activity is particularly important, given the rapid growth in volume of new-generation structured products issued by investment banks.

Hedge fund leverage estimated via an induction technique suggests a leverage ratio that must be above 3 (versus total AUM of USD 1.4 trillion). Gearing is required to boost returns where low risk and low return styles are implemented. Investment banks are well capitalised against hedge fund exposure.

“Structured products” are one of the fastest growing areas in the financial services industry, and may already be over half of the notional size of the hedge fund industry (AUM plus leverage). These products, constructed by investment banks, are extremely complex using synthetic option replication techniques, and offering a variety of guarantees in returns. They are sold to retail, private banking and institutional clients. Hedge funds help reduce volatility risk for investment banks in supplying these products.

Structured products are passive in nature (unlike hedge fund active styles), focusing on providing returns for different risk profiles of clients. These products have not been tested when major anomalies in volatility arise. They are highly exposed to downward price gaps in the ‘risky’ assets used in their construction. Considering the potential for such a crisis scenario, two major policy conclusions emerge: The importance of (1) stress testing of investment banks’ balance sheets; and, (2) given the large retail market segment, consumer education and protection.

An Overview of Hedge Funds and Structured Products: Issues in Leverage and Risk

*Adrian Blundell-Wignall**

Executive summary

- The size of the hedge fund sector, using IOSCO sources and results from responses to an OECD Questionnaire on Hedge Funds, is around USD 1.4 trillion in assets under management (AUM). While this does not seem that large compared to total global AUM, the hedge fund share of trading turnover (augmented by leverage and investment style) is much greater than its share of global AUM.
- On the issue of volatility, this paper shows that hedge funds play a critical role in providing liquidity for mis-priced assets – arbitrage opportunities – particularly when large volumes are traded in thin markets. This is a volatility reducing activity. This activity is particularly important, given the rapid growth in volume on new-generation structured products issued by investment banks.
- Hedge fund return performance, costs and style data can be combined to back out an implied number for global hedge fund leverage (in the absence of any hard data). The leverage ratio has to be well above 3 to come even close to consistency with the performance return numbers – leverage of over USD 5 trillion is implied.
- This leverage does not imply undue risk. This is because gearing is

* Adrian Blundell-Wignall is Deputy Director in the OECD Directorate for Financial and Enterprise Affairs. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its member countries.

required to boost returns on AUM for investors in hedge fund activities which, by their very nature, are low risk – because hedge funds to a large extent engage in market-neutral arbitrage activities that do not depend on the direction of the market.

- Investment banks have strong capital adequacy, in particular with respect to their hedge credit fund exposures – some estimates of which are provided below.
- Ironically, the fastest growing area of new financial products that utilise highly-complex derivative products exclusively lies mostly within the regulated sector. This is the market for “structured products” that are produced by investment banks and sold to retail, private bank and institutional clients. The strong volume growth in this area, particularly in Europe and Australasia, creates ex-ante derivative pricing pressure, and hedge funds frequently take the other side of the trades (reducing ex-post volatility).
- The size of this market is very roughly estimated to be around USD 3.8 trillion, already over half of the notional size of the hedge fund industry (AUM plus leverage), and growing quickly in the last two years.
- Structured products are passive in nature (unlike hedge fund active styles), and focus on providing returns (for different risk profiles of clients) with some element of capital guarantee. Constant proportion portfolio insurance (CPPI) is one of the popular new-generation techniques. These products have not been tested when major anomalies in volatility arise. They are highly exposed to downward price gaps in the ‘risky’ assets used in their construction.
- The potential for a crisis scenario in the event of such anomalies in volatility, with multiple investment banks having to close positions (due to ‘knock-on’ effects) is considered. Hedge fund and other counterparty’s ability to meet calls in this situation would affect the size of the balance sheet risk for investment banks.
- This raises two main policy issues. (1) The balance sheet risks to investment banks offering guaranteed products: stress testing for worst case scenarios and ensuring capital adequacy for them is important to reduce concerns about financial stability; and (2) given the large retail market segment, consumer education and protection.

I. What is a hedge fund?

Hedge Funds have grown quickly over the past ten years, and are important part of the financial landscape. They are difficult to define as entities, because the line between what hedge funds do that other institutions do not is blurred – proprietary traders in investment banks, private equity funds, and fund managers all use extensive leverage and derivatives to trade markets or to shift risks.

*Lightly-regulated
active investment
style using
derivatives*

The definition of a hedge fund used here is as follows: lightly-regulated managers of private capital that use an active investment approach to play arbitrage opportunities that arise when mis-pricing of financial instruments emerge. Extensive use of leverage and derivatives is a common feature of hedge funds.

The main differences between a hedge fund and a private equity fund are: (a) the private equity fund looks to use leverage to buy companies to obtain full management control for purposes of changing its structure operations, whereas a hedge fund trades assets without looking for full control; (b) the hedge fund covers a multitude of styles, only one small part of which might involve buying shares to force management to make value enhancing changes (activist); and (c) hedge funds often (but not always) have a shorter investment horizon than private equity firms.

*They play a key role
in providing liquidity*

Overall, hedge funds fill a broad role in providing liquidity in markets where pricing anomalies have occurred, often due to lack of breadth. In the main this is a volatility reducing activity that is an essential part of the efficient working of financial markets and financial stability.

II. Hedge fund industry size: AUM *versus* turnover

*Size of USD 1.4
trillion AUM*

At the start of 2007, estimates suggest that hedge funds have over USD 1.4 trillion assets under management (considerably less than the USD 18 trillion in mutual funds; see Table 1). Some high-end estimates have it higher at closer to USD 2 trillion. The bulk of hedge fund activity is in the United States, followed by the United Kingdom and EU (ex UK), with Australasia next.

Table 1. Hedge funds' assets under management (AUM)

Country	Mid 2006 Estimates
	\$bn
USA	870
UK	320
EU	118.4
Australia	47
Non-Japan Asia	34.05
Switzerland	23.1
Canada	11
Japan	7
TOTAL	1430.55

Source: IOSCO; and OECD Questionnaire on Hedge Funds.

***Augmented by
leverage***

Of course the 'fire-power' of hedge funds is greatly augmented beyond this by leverage, though the amount of this is uncertain due to lack of reporting and the difficulty of assessing the implicit gearing of derivatives.

Table 2. Shares of hedge fund trading in the US market

Shares of Hedge Fund Trading in US Markets	
	%
Cash equities	30
Credit Derivatives (plain vanilla)	60
Credit Derivatives (structured)	33
Emerging Mkt Bonds	45
Distressed debt	47
Leveraged loan trading	33
High Yield bond trading	25

Source: Greenwich Associates, as reported in *The Financial Times*.

***And have a large
impact on market
turnover***

Leverage, when combined with a rapid and focused trading style, allows hedge funds to have a much bigger impact on market turnover than the AUM figures would suggest. In Table 2 data from Greenwich Associates suggests that hedge funds account for between 30% and 60% of market turnover, depending on the financial instrument concerned. This of course is very large indeed, and illustrates why understanding financial market behaviour today without

including explicit analysis of hedge funds is quite impossible.

Two concerns often raised with respect to hedge funds are: (a) that they create volatility in markets due to their large role in turnover, and (b) that the leverage they undertake may raise financial stability issues, where defaults with counterparties occur – an issue given some credence by the late 1990s failure of LTCM, that required a major private bank-led work out to resolve.

III. Hedge funds reduce volatility

Volatility-reducing role

The analysis in this paper suggests that hedge funds play a very positive role in financial markets by providing liquidity to thin markets where mis-priced financial instruments are to be found. This type of activity reduces volatility rather than increasing it.

Particularly given the growth of structured products

Indeed with the rapid growth of structured products in recent years, particularly in Europe and Asia, hedge funds have been quite critical in containing the volatility that might otherwise have arisen. Structured products are largely driven by investment banks, and have resulted in the proliferation of new and highly-complex derivative products (discussed below).

Figure 1 shows the VIX index of market volatility, the junk bond versus AAA spread and the TED spread (the offshore Eurodollar 3-month rate versus the 3-month Treasury). Volatility has fallen, and spreads have narrowed.

Hedge funds are put sellers in the carry trade

In large part, spread narrowing in the past few years has been a process that has been driven by hedge fund or ‘carry’ trades. These carry trades are usually implemented with derivatives. A spread emerges where risk premia in two financial instruments differ. These are taken advantage of by selling puts. These pay the seller a premium in income (positive ‘carry’) and work as long as the spreads do not blow out as a consequence of some credit event. The buyers of puts (the other side of the trade), have negative carry (they pay a premium to the seller) and so continually lose money as markets rally and spreads narrow. Buyers rely for profit on an

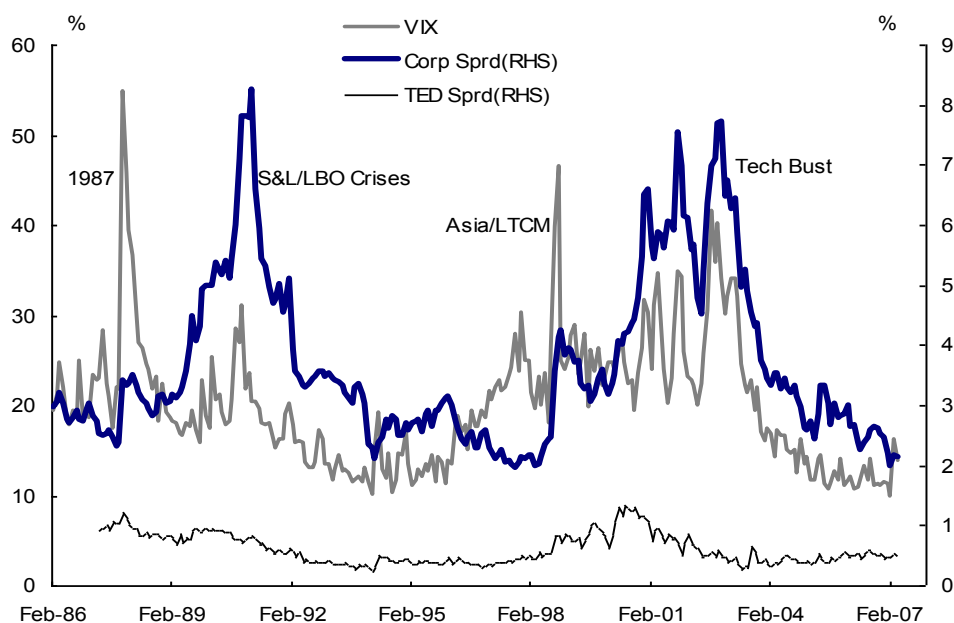
adverse credit event to occur to put them ‘in the money’. The longer this does not happen the greater is the incentive of buyers of puts to stop further losses by quitting the trade. As this occurs the spreads have to narrow further (because buyers of puts need to be induced by further price action). In the absence of exogenous risk events, volatility continues to fall and spreads narrow.

***Structured products
are natural buyers
of puts***

Passive buyers of puts, including investment banks buying for capital guarantee purposes in structured products, benefit from spread narrowing in pricing their products for retail, private banking and institutional clients – encouraging the growth of this market.

Figure 1. Falling volatility narrowing spreads

Market volatility, corporate spreads and the TED Spread



Source: Thomson Financial Datastream.

IV. Hedge fund performance, fees and costs

Table 3 shows hedge fund composite performance reported in Thomson Financial Datastream *versus* the MSCI global equity index. These returns are net of MERs (management expense ratios, arising from trading), incurred as costs to make the returns, and fund manager costs.

Hedge fund performance has been declining

Three things stand out: (1) hedge funds have managed to outperform the global index on average, but not every year; (2) hedge fund performance is correlated with global performance, but does much better relatively when equity markets are weak or falling (good diversifying characteristics); (3) both total and relative performance have declined in the 2000's.

Table 3. Hedge fund performance

Year	Equities World Index	Hedge Fund MSCI Universe	Ret Diff
1991	16.0	32.2	16.2
1992	-7.7	21.2	28.9
1993	23.1	30.9	7.8
1994	4.1	2.6	-1.5
1995	14.4	25.7	11.3
1996	10.9	18.0	7.1
1997	11.3	18.3	7.0
1998	19.6	7.9	-11.7
1999	30.5	26.4	-4.2
2000	-16.4	15.0	31.3
2001	-17.6	7.6	25.2
2002	-18.5	2.5	20.9
2003	34.8	15.4	-19.4
2004	15.5	6.9	-8.6
2005	11.2	8.1	-3.0
2006	21.3	11.3	-10.0
Av 1991-99	13.6	20.4	6.8
Av 2000-06	4.3	9.5	5.2

Source: Thomson Financial Datastream, Hedge Fund MSCI universe.

Hedge funds have to spend a lot to make a lot

Hedge funds' massive share of turnover means that they pay a lot to investment banks for their activities (execution costs), and the funds have to pay their fund managers very well. MERs are very high for hedge funds, compared to mutual funds (due to turnover). Broking estimates suggest

that about 25% of the pre-MER-traded returns are absorbed by fees paid to hedge fund managers, and around 20% are absorbed by execution costs to prime broker dealers, *i.e.* about 45% in all. So for the 11.3% return in 2006, hedge funds would have earned $11.3/(1-0.45)=20.5\%$ before MERs.

Which pushes towards more leverage

The point here is that to generate double digit returns to investors, hedge funds would have to try to earn raw pre-MER returns of 20% or so, and this further pushes pressure towards more leverage (to gear up the return from investing in low risk and return spread trades).

V. Hedge fund styles

Long-short styles dominate

A summary of the different styles of hedge funds and the proportion of the market they occupy is shown in Table 4, based on Hedge Fund Industry Research data. An indication of the broad activity involved in the style is shown on the right hand side. Most of these strategies are long-short in nature: all of the equity hedge (*e.g.* long a stock and long a put to hedge its fall); most of event driven (*e.g.* buy the target M&A company and sell the buyer); all of relative value arbitrage (*e.g.* buy the London listing and sell the Sydney listing if an arbitrage spread premium opens); and all of sector, convertible arbitrage and equity market neutral. The macro (*e.g.* long only) and other (*e.g.* corporate governance activist, structured products, etc.) categories include directional riskier plays.

Low-risk spread trades require leverage to make returns

The dominant nature of this long-short or spread trading activity explains why hedge funds do so well in market downturns (*i.e.* it is not directional). But it also explains why leverage needs to be relatively high: investing in a strong stock market generates strong returns, while investing in a low-risk spread in a long-short strategy does not. So the trade has to be levered up a number of times in order for the spread trades to generate competitive returns (while keeping the benefit of avoiding directional risk in the market).

This understanding of how the various styles work, together with the return and MER cost information, can be used to get some idea of overall hedge fund leverage.

Table 4. Hedge fund styles

Style	%	Nature of Strategy
Equity Hedge	29	Stock+deriv strategies
Event Driven	14	M&A, spin offs, bankruptcy re-org
Relative Value Arbitrage	13	Listing same security in 2 diff mkts
Macro hedge	11	Directional plays
Sector	5	Long one versus another
Distressed securities	4	heavy dicount work outs
Emerging markets	4	Equity and debt
Equity non-hedge	4	Activist raids
Convertible arbitrage	3	Buy convertible sell stock
Equity market neutral	3	Long one stock short another
Other	10	
TOTAL	100	
Equities activities	61.0	
Long short activities	72.5	

Note: The equities activities are very approximate and (apart for obvious categories) assumes ½ of event driven, ½ of relative value arbitrage, ½ macro, ½ of emerging markets, ½ of convertible arbitrage, and none of other is equity related. Long-short (apart from obvious categories) assumes 75% of event driven, ½ of other, and none of macro, distressed securities and emerging markets is of the long-short variety.

Source: Hedge Fund Industry Research Report Q3 2006.

VI. Implied hedge fund leverage

Data on hedge fund leverage is difficult to find, and more work needs to be done in this area

It is difficult to find data on hedge fund leverage, and more work needs to be done in this area. Illustrative calculations based on the nature of returns and the type of hedge fund activity can be used to infer some idea of the amount of leverage involved. These calculations show that hedge funds are likely to be somewhat less levered than banks and broker-dealers. This is as it should be, since banks come within the purview of regulation and supervision, and benefit from lender-of-last-resort facilities – they can take on more risk.

A simple calculation to imply leverage

The calculation is shown in Table 5. The fund styles are combined around the nature of returns: (a) low returns for fixed income arbitrage, about USD 97 billion in AUM – and

here we assume a 1% return (somewhere between the very low TED spread of around 0.5 ppt and the high 2 ppt spread on junk bonds versus AAA shown in Figure); (b) medium returns for equity type spreads of about 4%, reflecting the average equity risk premium, with about USD 919 billion in AUM; and (c) high returns for outright equity type long positions, with about USD 415 billion AUM – the 20% return for this grouping shown in the table is roughly equal to the MSCI return for 2006 shown in Table 3.

The implied leverage then is simple enough to calculate. Fixed income arbitrage managers would need to have geared their portfolios 19 times to generate the 20% pre-MER return earned in 2006 (in order to give the observed 11% to investors). This implies gearing of USD 1 835 billion, in addition to the USD 97 billion in AUM. Other long-short styles would have had to gear only 4 times to generate 20%, implying USD 3 676 billion in gearing. Finally, the long only funds would not have had to gear at all to generate the 20% return in 2006.

Table 5. Implied hedge fund leverage calculation

	AUM \$bn	Req Ret %	Observed Return %	Req Asset For 20% ret on AUM \$bn	Implied Gearing \$bn	Leverage Ratio on AUM x
Fixed Income Arb.	96.6	20	1	1931.2	1834.7	19
Other long short	919.1	20	4	4595.6	3676.5	4
Long Only	414.9	20	20	414.9	0.0	0
Total	1430.6			6941.7	5511.2	3.9

Source: OECD.

USD 5.5 trillion hedge fund leverage number

Together these 3 groupings imply an overall leverage ratio of only 3.9 times, or a total leverage of USD 5.5 trillion compared to the USD 1.3 trillion of funds under management. The bulk of this USD 5.5 trillion will come through implicit leverage in derivatives (see below).

VII. Counterparty risk with prime brokers

Table 6 uses publicly available information on prime broker counterparty exposures, using (published) company report balance sheet data. The 10 largest prime brokers in the area of counterparty risk were chosen, and these cover, on our best estimate, about 80% of the total. Margin lending is not broken out of other credit activities in the publicly available reports. Counterparties are typically other banks and hedge funds.

Table 6. 10 Prime brokers: published credit exposure to counterparty risk

As of December 2006

	Loaned Securities \$bn	Ratio to Tier 1 Capital	Reverse Repos \$bn	Ratio to Tier 1 Capital	Derivatives PRV \$bn	Ratio to Tier 1 Capital	Margin Loans NYSE Total \$bn	Total Credit Exposure \$bn	Tier 1 Capital \$bn
UBS	52	1.56	333	10.01	269	8.10	#N/A	#N/A	33
Credit Suisse	48	1.65	140	4.87	45	1.57	#N/A	#N/A	29
Deutsche	31	0.95	183	5.66	99	3.08	#N/A	#N/A	32
Goldman	22	0.66	82	2.45	68	2.02	#N/A	#N/A	34
Morgan Stanley	150	4.07	175	4.74	55	1.50	#N/A	#N/A	37
JP Morgan	9	0.11	122	1.51	56	0.69	#N/A	#N/A	81
Lehman	18	0.96	117	6.33	23	1.22	#N/A	#N/A	19
Merrill	43	1.09	178	4.47	32	0.80	#N/A	#N/A	40
Citigroup	60	0.66	121	1.33	50	0.55	#N/A	#N/A	91
Bear Stearns	11	0.89	39	3.03	12	0.91	#N/A	#N/A	13
TOTAL	444	1.09	1491	3.65	708	1.74	275	2926	408
Grossed Mkt Tot. (Top 10 =80%)	555	1.09	1864	4.57	885	1.74	367	3672	510

Source: Prime broker published balance sheet accounts; Thomson Financial and OECD estimates.

There are four key areas where prime brokers generate credit exposure in their financing relationships (counterparty risk). These are:

Sources of credit exposure in counterparty risk

1. **Securities lending:** the bank lends securities to hedge funds and others, and gets cash or other securities as collateral (found on the liabilities side of the balance sheet as cash received as collateral for securities lent). Hedge funds, for example, borrow stock in order to short securities. Other banks also borrow stock.
2. **Reverse repurchase agreements:** the bank buys securities from a hedge fund etc. which in turn commits to buy them back (found on the asset side of the balance sheet) – the hedge fund gets a credit,

but counterparty risk arises in the event that the customer cannot fulfil its obligations. This is an important mechanism of hedge fund borrowing.

3. **Derivatives:** derivative contracts with hedge funds create counterparty risk (found on the asset side of the balance sheet), which is measured as their positive replacement value (PRV). This is equal to the cost to the bank of replacing all the transactions with a fair value in the bank's favour, if all the relevant counterparties of the group were to default at the same time. This is a margin account concept, and massively understates the notional value of derivatives contracts (potential command over securities).
4. **Margin loans:** the bank advances a loan to a hedge fund (asset side) and gets a security from the hedge fund as collateral (usually cash and securities). As mentioned above, this important activity is not separately disclosed by prime brokers. However, we have total margin lending by members of the NYSE, which is shown in the table.

The bottom line of the table grosses up the numbers for industry totals, by assuming that 80% is covered by the top 10 firms. For the margin lending we assume 75% is covered by member of the NYSE.

But capital adequacy is very high in general

The main point to note is that counterparty exposure differs considerably between the prime brokers, with higher risk-taking firms (to generate higher returns) showing high exposures relative to tier 1 capital, and more conservative firms showing much lower ratios. The total exposure of the top 10 firms is about USD 2.9 trillion, and total Tier 1 capital is around USD 408 billion. The capital adequacy ratio *vis-a-vis* these activities is about 14%, which is very high. Furthermore, it should not be forgotten that there are offsetting collateral and risk measures taken throughout the market, and some of the measures like PRV of derivatives is the amount that would apply if 100% of the counterparties were to default. In other words, the call on capital is likely to be low overall.

This does not mean, however, that major stability issues cannot arise in the case of concentrations of risk for particular firms.

Exposure of prime brokers to the hedge funds group

One prime broker amongst the top 10 firms separates out its exposures between bank and hedge fund counterparties, for 3 of the 4 categories above (excluding margin loans). We have used this as a guide, together with broad discussions with other market participants, to come up with shares for each of the 4 activities as they pertain to hedge funds, shown in Table 7. Notice that these numbers are also broadly in line with the Greenwich percentage numbers on share of hedge funds in market turnover (see Table 2).

And particularly so with respect to hedge funds

Overall, the **prime brokers are very well capitalised** against hedge fund exposures. The exposure of prime brokers to hedge funds, as a ratio to Tier 1 capital, is 2.4. This is equivalent to a capital adequacy of around 42% *versus* the hedge fund sector.

Table 7. Hedge fund shares of prime broker counterparty exposure

	Total Credit Exp \$bn	Ratio to Tier 1 Capital	Hedge Fund \$bn	HF% Total Exposure	HF Exp Ratio to Tier 1 Capital
Loaned Securites	555	1.09	222	40%	0.44
Reverse Repos	1864	3.65	466	25%	0.91
Derivatives PRV	885	1.74	292	33%	0.57
Margin Loans	367	0.72	242	66%	0.48
Total	3672	7.20	1223		2.40

Source: Prime broker published balance sheet accounts, Thomson Financial and OECD estimates.

The overall credit exposure of prime brokers with respect to hedge funds is estimated to be around USD 1.2 trillion. This number is not far off the AUM of the hedge fund industry that we discussed earlier – possibly reflecting the fact that most hedge fund trades are carried out with derivatives, and other activities that require cash margin deposits or collateral to be posted. It is these sorts of deposits that are picked up in the prime broker accounts.

*Derivatives are the
biggest source of
leverage for hedge funds*

The command over notional assets, however, is much stronger than reflected here. The implicit leverage in derivatives is very large. If we took out USD 5.5 trillion calculation for total leverage, and treated loaned securities, reverse repos and margin loans as fully collateralised, then derivatives PRV of USD 292 billion would, as an example, reflect an implicit derivatives leverage of USD 4.6 trillion (= USD 5.5 trillion – USD 0.9 trillion other debt).¹ So derivatives are easily the biggest source of leverage for hedge funds.

VIII. What is a structured product?

*Structured products are
not discretionary*

The term ‘structured product’ is the name given to an investment product that provides a return that is pre-determined with reference to the performance of one or more underlying markets. The performance of a structured product is therefore based only on the performance of this underlying product and not on the discretion of the product provider. Most often the product relies on the use of derivatives to generate the return, and contains downside protection or guarantees of some form via options.

Structured products are therefore **passive in nature**, with the cost depending on option and other derivative premia. This contrasts with hedge funds, where the fees are justified on the basis of buying the manager’s active skills.

Structured products may be of the growth variety, offering equity-like returns, but typically including varying elements of capital protection. They also include structured notes, which replicate fixed income products. CDOs (Collateralised Debt Obligations) and CLOs (Collateralised Loan Obligations) would fit into this category of description if they came with derivative transformations.²

-
1. This would imply an average margin of about 6% (= 292/4600 %). If anything this is on the large side for margins, suggesting even higher leverage. But different deals have quite a wide range of margin requirements, and this average number is not wildly out of line.
 2. Some of the income products provide a high income component, but with a risk to the capital return if markets fall (e.g. an equity underlying security with a sold call to

Tranche and continuous product varieties

The products are sold in two broad forms: (1) the ‘tranche’ variety, *i.e.* with a fixed maturity date (typically 1-5 years), or (2) as ‘continuous’ product with no fixed maturity date. They may be closed-end funds, or the seller may be able to cancel shares on redemptions like a mutual fund.

Complex derivative structures are used

While structured products have been around for a long time in various forms, the new-generation portfolios sold use highly complex derivative structures. They use synthetic options replication techniques to tailor products to all combinations of risk and return for investors.

Use of complex derivatives

Constant proportion portfolio insurance

The most popular products use Constant Proportion Portfolio Insurance (CPPI). This is the name given to a trading program that is designed to ensure that a fixed minimum return is achieved either at all times or, more typically, at a set date in the future. Essentially the strategy involves continuously re-balancing the portfolio of investments during the term of the product between so-called risky assets (usually shares) and non-risky assets (usually bonds or cash). As the value of the risky assets rise, more of the portfolio is placed in these assets; but conversely, as they fall in value, more of the portfolio is placed in the non-risky assets. By following the rules set out by the strategy the minimum return can be achieved as long as the value of the risky assets does not fall too sharply. In this case, however, the product provider offering such a product would rely on a guarantee or option provided by a third-party investment bank to ensure that the minimum return was achieved – this is the capital guarantee aspect of the product, wherein lies most of the cost in buying them.

Sold to retail private banking and institutional clients

Because structured products emphasise downside protection with simultaneous participation in the upside, they are very attractive to retail investors. They are sold by investment banks to their retail broking arms. However, they are also sold to private banking clients and to institutions (fund managers, hedge funds, etc).

boost income – so that some of these products can participate in a falling market to some degree).

These CPPI products are difficult to understand for technical analysts, so there can be no doubt that the retail buyers of these products will not understand what they are buying. They are often sold with promises of best ex-post returns from a basket of securities, with downside protection – sometimes very much like betting on the winner of a horse race after the race is run. For the 1-1.5% spread cost to the client, such outcomes are deliverable, provided volatility remains normal.

Policy issues

The policy issues that arise here are:

Consumer protection issues arise

1. Financial education and consumer protection, given the complexity of the products; and

Capital adequacy is critical

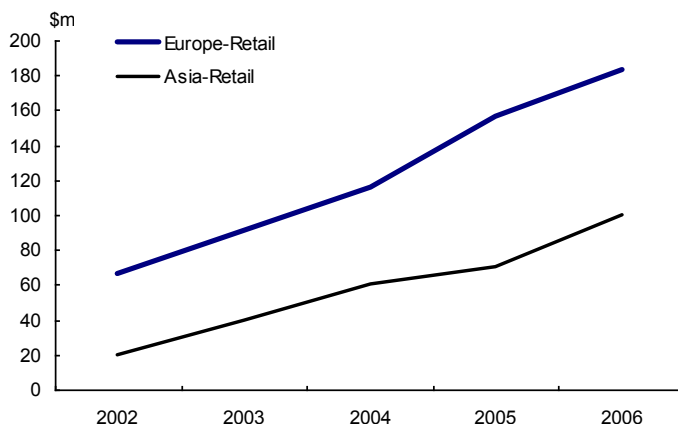
2. The extent to which financial institution capital standing behind these products (as an ultimate guarantee) might be at risk, if volatility moves into abnormal patterns.

IX. Structured products: the new growth area

Structured products are very popular in Europe and in Australasia, and are becoming more popular in the USA.

Structured products sales have been booming in recent years, particularly in Europe and Asia

Figure 2 shows that structured products are one of the fastest growing areas within the financial services sector. In 2002 about USD 65 billion of these products were being issued to retail clients in Europe, whereas by 2006 this had grown to over USD 180 billion of new issues per annum. In 2002 about USD 20 billion was issued to retail clients in Asia, whereas by 2006 the volume was closer to USD 100 billion. These sales considerably understate the flows into the market, because the industry provider of the retail data only has coverage from clients that subscribe to the service. Furthermore, there are no data on the sales to private bank clients (very wealthy individuals with large minimum size investments), nor to the institutional market.

Figure 2: Gross sales of structured products p.a. to retail clients

Source: www.structuredretailproducts.com, and investment banks.

The outstanding size of live global structured products could be around USD 3.8 trillion

The approximate size of the outstanding AUM on the retail side of the market is about USD 1.2 trillion. But the private banking and institutional parts of this market are also very large. Industry intelligence suggests that both of these other areas are similar in size to the retail market for structured products. If this is broadly correct, it would put the size of the structured product market at about USD 3.8 trillion (see Table 8). This (very approximate) size of the total structured products market is just over half the estimated size of the hedge fund notional size (allowing for leverage) of about USD 6.9 trillion.

Table 8. Stocks of outstanding products

	EU \$bn	USA + Can \$bn	Asia \$bn	Total \$bn
Retail	788.39	192.34	290.00	1270.74
Private Banking	#N/A	#N/A	#N/A	#N/A
Institutional	#N/A	#N/A	#N/A	#N/A
Total 3x (?)	2365.18	577.02	870.00	3812.21

Source: StructuredRetailProducts.com, and guesses based on discussions with the industry.

X. Structured products and hedge funds in a ‘gap’ scenario

The volume of issuance (sales) and the size of outstanding structured product portfolios have a material impact on derivative pricing and spreads. An investment bank will issue derivatives into the market to construct portfolios for sellers of these products, creating natural opportunities for hedge funds to come in on the other side of the trade. It is common knowledge in investment banks that hedge funds help to reduce their volatility risk, providing liquidity in a very complementary way.

Falling volatility and spreads as the volume of product grows requires normal volatility

For example, active hedge fund spread trades alluded to earlier are carried out by selling puts – while portfolio insurance by buying puts is a very important part of providing downside protection to risky assets within a CPPI product. All of this volatility reducing and spread narrowing activity assumes markets continue to perform in the manner that they have in the past few years.

The risk is a major exogenous event that reverses the virtuous circle

The main risk is that a major (exogenous) volatility event occurs. A sharp rise in volatility (known as a ‘gap’ event) poses a risk to the virtuous circle situation described earlier. It is by no means clear that the CPPI and related products could cope with such a gap event, and positions would have to be closed. **The size of the potential stability issue that could emerge would depend on:**

1. the size of the fall in the market – a move of 20-25% – would be a major test;
2. the extent to which investment banks had similar products and had to close positions at the same time, leading to bigger market fall – knock-on effects;
3. the extent to which sellers of protection, including hedge funds, could meet their calls – any defaults would further accelerate the process;
4. the extent of redemptions demanded by structured products and hedge fund clients as risks became a public concern.

If products could not deliver the prospectus-promised returns, in such a vicious circle event investment bank balance sheets would have to cover losses.

This is a major area of policy interest. Investment banks and hedge funds both need to be encouraged to stress test their portfolios for an event like this, allowing for worst-case knock-on effects. If the size of position closures required is a large proportion of daily trading volume, a severe liquidity crisis could emerge. Investment banks in particular need to ensure that their capital remains sufficient to cover such a contingency.

The Private Equity Boom: Causes and Policy Issues

Adrian Blundell-Wignall

Private equity plays a valuable role in helping transform under-performing companies. M&A and private equity deals are very strong at present, and use of leverage in deal making is accelerating sharply, as it did in the late 1980s. The process is being driven by a number of factors, particularly low yields which result from excess global liquidity.

The accommodation of leverage is fungible with innovative global financial markets, and policies to fix the price of money in some parts of the world make it difficult to control supply (as they did in the Louvre Accord period in the late 1980s). The arbitrage opportunity that has been opened up plays a key role in driving asset price inflation, including stock prices through private equity deals. As the LBO process moves into its mature phase, deal multiples are bid up in the industries and companies where the activity is concentrated. Strong investor demand, together with readily available finance, increases the pressure to find new deals, driving down yields.

Excess concentrations of leverage can give rise to financial stability issues. However, policies that contribute to excess global liquidity are difficult to change in the short run, because domestic concerns in some countries are overwhelmingly important. Firms and financial intermediaries therefore should be strongly encouraged to perform stress tests and to maintain strong credit checking processes, particularly with regard to the sustainability of debt at a more normal cost of capital. Credit rating agencies need to apply high standards to credit risk transfer products, and sound principles of corporate governance are required to ensure moral hazard issues do not exacerbate things.

The Private Equity Boom: Causes and Policy Issues

*Adrian Blundell-Wignall**

Executive summary

- Private equity, by focusing on under-performing companies that can be transformed and subsequently re-floated, fosters rapid corporate restructuring – enhancing productivity.
- M&A and private equity deals are very strong at present, and private equity use of leverage is accelerating sharply.
- The process is being driven by a number of factors, particularly low yields. These have opened up a massive arbitrage opportunity for companies and investors to buy higher yielding assets generally. Hedge funds do this across a variety of assets – but private equity is taking up the same opportunity to use leverage to buy higher yielding corporate assets in the listed equity market – to take companies private and augment returns even further.
- Low yields result from excess global saving and liquidity. They risk pushing leverage and equity prices in parts of the corporate sector to excessive levels.
- Wherever strong growth in LBO activity emerges across a broad range of global industries, it is likely that it is being accommodated by distortions somewhere in the global

* Adrian Blundell-Wignall is Deputy Director in the OECD Directorate for Financial and Enterprise Affairs. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its member countries.

financial system: *i.e.* fixing the domestic opportunity cost of money, or the international price of money (the exchange rate), at a too-low level. Innovative financial markets will take advantage of it.

- As the LBO process moves into its mature phase, deal multiples are bid up in the industries and companies where the activity is concentrated. The strong growth of capital available to private equity resulting from strong investor demand, together with readily available finance, increases the pressure to find new deals. This is driving down yields into line with (too low) interest rates. As this process continues it becomes more risky.
- It is excess concentrations of leverage that give rise to financial stability issues rather than the average level of debt for the economy as a whole.
- ‘Global’ policy would ideally focus on removing distortions that create excess global liquidity, but sometimes domestic policy considerations in some regions make this difficult. This raises the question of what else can be done.
- Firms themselves should be strongly encouraged to stress test their ability to cover interest costs for more normal levels of interest rates, including any related impact this might have on supply and demand conditions in their industry, before recommending bids to shareholders.
- Financial intermediaries should be encouraged to maintain strong credit checking processes even if debt is shifted off balance sheet via securitisation. Credit rating agencies need to apply high standards to credit risk transfer products.
- Financial intermediaries should be strongly encouraged to stress test their exposures, and to ensure they have adequate capital to cope with credit events that may arise over the LBO cycle.
- Moral hazard conflict of interest mechanisms may also contribute to pushing the leverage process too far in individual companies and sectors. Issues here include: the fee structure of deals, systematic removal of downside risk by refinancing profit lock-ins, misuse of private

information and insider trading. Insider trading is evidenced by the movement in share prices and credit default swaps prior to the public announcement of deals.

- In this context, there may be some role for private equity industry bodies to help with transparency by better clarifying ‘fair and reasonable’ rules of the game. Better cross-border self regulation and transparency with respect to these issues could be very useful. There is a need to strike the right balance between the need for commercial confidentiality and the misuse of private information.
- Private equity plays a valuable role, in helping transform under-performing companies. Finding an approach to policy that does not inhibit these productivity-enhancing activities, while ensuring that leverage does not become too excessive and fair and reasonable rules of the game are adhered to, is the key policy issue at the micro level. This is especially important at times when liquidity is plentiful in the global economy, and rates are too low.

I. The private equity value proposition

Private equity has a limited partnership structure

A private equity firm is usually structured as a limited partnership.

The General Partner (unlimited liability) receives capital from the limited partners (pension funds, insurance, rich individuals, hedge funds etc.), and pays the managers and other consortium members out of fees. A consortium of the equity providers, advisers and lenders is put together for each targeted buyout bid.

Figure 1 shows the main elements of the private equity value creating proposition.

Capital structure

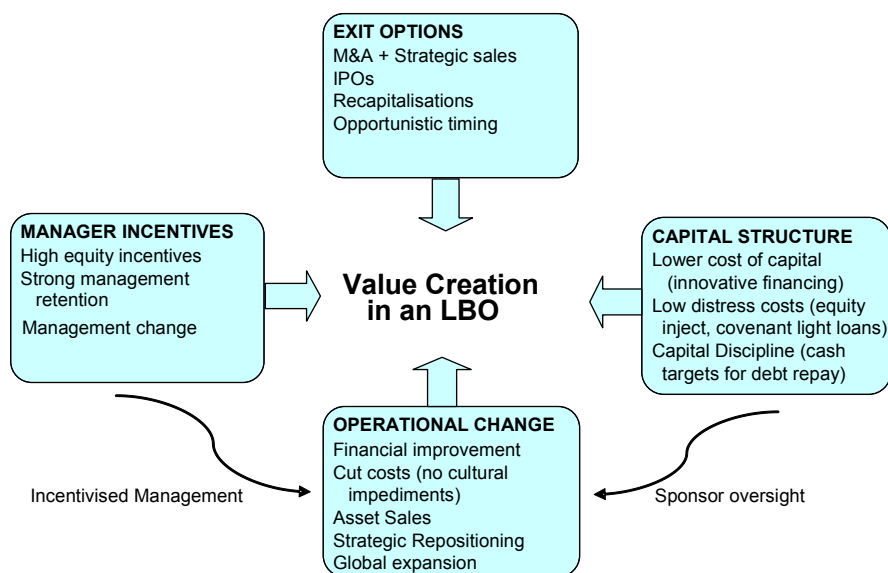
The whole point of private equity is to transform capital structures with debt, and shift the risk from equity to debt holders

The main feature of a private equity deal is the high reliance on debt. A simple arithmetic example is shown in Table 1.

The key feature is leverage – the whole point is to transfer risk to lenders and enhance the return on equity for the investors. An under-levered,

underperforming company is targeted. In the deal phase, a 70% debt and 30% (private) equity structure (shown here) is typical (though 80% debt is not uncommon). A premium of say 20% (shown here with the price-earnings ratio, PE, of 10) is offered over the listed price. The debt level associated with the acquisition rises sharply, usually to 5 to 8 times earnings before interest and tax (EBIT, here 7 times). Debt service rises sharply, profit before tax falls significantly, but due to the tax deductibility of interest, after-tax profit falls less. The return on the private equity virtually doubles. Of course the (typically) 2% of the total value of the deal, paid up front in fees, adds to the immediate benefit of fund manager remuneration and the partners in the deal.

Figure 1. The private equity value proposition



Source: OECD

Innovative financing is important; debt cost can be cut and liquidity management improved

Structures have changed over the years. Innovative financing is used to reduce costs and manage liquidity. In 1989 the RJR Nabisco USD 31.4 billion deal was 9.6% equity, 20.1% equity-like debt, 31.5% subordinate debt and 38.8% senior debt. In 2006 the USD 32.1 billion HCA deal was 19% equity, 38.2% subordinate debt and 42.8% senior

debt. Bank commitments usually fund the initial phase of the deal, as it is being put together (2-4 months). Banks then securitise once the deal is completed and after credit ratings are obtained. CDOs, CLOs, swaps, fixed/floating, second liens, non-amortising components may be used, depending on the geography and nature of the deal. In the recent HCA deal, some of the senior debt has a toggle feature, giving the borrower the option to pay interest in 100% cash; 50% PIK (pay-in-kind interest payments by extending the loan) and 50% cash; or 100% PIK – depending on what suits

Table 1. Arithmetic example of a private equity deal

<u>Public Company</u>		<u>The Deal Phase Period 1</u>		<u>Exit Yr4 .10% Growth</u>	
Market Cap \$m	100	Mkt Cap, (20% prem bid) \$m	120	IPO Value	315.0
EBIT (margin 10%) \$m	12	EBIT (margin 10%) \$m	12	EBIT (margin 20%) \$m	35.1
Sales \$m (costs 108)	120	Sales \$m (costs 108)	120	Sales \$m (costs 140.6)	175.7
PE (vs say peer avg of 10)	8.3	PE (vs say peer avg of 10)	10.0	PE exit 10% disc. to deal mult.	9.0
Debt on balance Sheet (1xEBIT) \$m	10	Debt @ (7x EBIT) \$m	84	Debt \$m--constant target	84.0
Debt service @ 7%	0.7	Debt service @ 6% \$m	5.04	Debt service @ 6%	5.0
Net profit before tax \$m	11.3	Net profit before tax \$m	6.96	Net profit before tax	30.1
Profit after tax @ 30%	7.91	Net profit after tax @30% \$m	4.872	Net profit after tax @30%	21.1
		Equity contribution to deal \$m	36	Compounded equity at cost of K	45.4
Yield %	7.91	Yield for Priv Eq investors %	13.5	Yield % on Equity	46.4
		Yld incl.up-front fee @2%	20.2	Capital gain % on Priv Eq	774.9
				Capital Gain on public Company	214.98

Source: OECD.

Access to capital and use of low covenant loans help

The ready access to capital injections in private equity funds – by drawing down capital not yet invested, or by asking investors for more – helps reduce risk spreads. Swaps can be used to stream interest payments in line with the currency of different companies in the portfolio.

The use of low-covenant loans, and the ability to negotiate with lenders facilitates liquidity management.

Venture capital can also be obtained from private equity, allowing a whole class of new technology enterprises to obtain funding that would not otherwise happen.

Private equity helps restructure poorly performing companies, reallocating capital in an efficient way, increasing productivity

Equity incentives are used to retain staff and keep focus on improvement of the company

Private equity companies can exit at the most opportune time, when the company is ready – debt reduced and margins improved

Operational change

After the deal is completed, the private equity managers get full control of the company. They are not distracted, as with public companies by corporate reporting and market focus; by dealing with shareholder meetings and all aspects of corporate governance; by dealing with brokers and their analyst reports; etc.

They can quickly sell non-core assets, sometimes to other entities that they own where there are better synergies and savings.

Stringent cost reductions follow, spurred by the need to repay the debt quickly. Duplication of back-office functions can be removed, particularly where assets are being sold and acquired. More flexible labour arrangements can be pushed through more easily.

Equity incentives

Equity incentives of ½-1% of the deal size are ‘normal’. This is to attract and maintain good managers in the company. This stability is critical in the operational change phase.

There are restrictions, such that management can’t exit before investors. They would forfeit any equity on premature termination of their contract. Sometimes management is tied with loans to buy equity stakes.

Any existing management equity options in the listed vehicle fully vest upfront, as soon as the deal is completed – a huge incentive.

Exit phase

The private equity company will sell the company after it is fully transformed. In a non-mark-to-market environment, it can choose the best time to sell, and the best available option; for example, an IPO, or a trade sale to a strategic listed or unlisted buyer.

It can sell to entities where the regulatory and tax environments are better, and it can choose regionally where

the depth of capital markets are best suited (without for example of going through all of the corporate governance issues of listing changes, etc.).

In the above arithmetic example, the company grows at 10% p.a. for four years and doubles the EBIT margin from 10% to 20% in the operational change phase, while keeping the nominal level of debt constant (thereby dramatically cutting the debt equity ratio and raising interest cover).

Even if the company re-lists at a 10% discount to the earnings multiple of the original deal (a PE of 9), the returns shown are extraordinary.

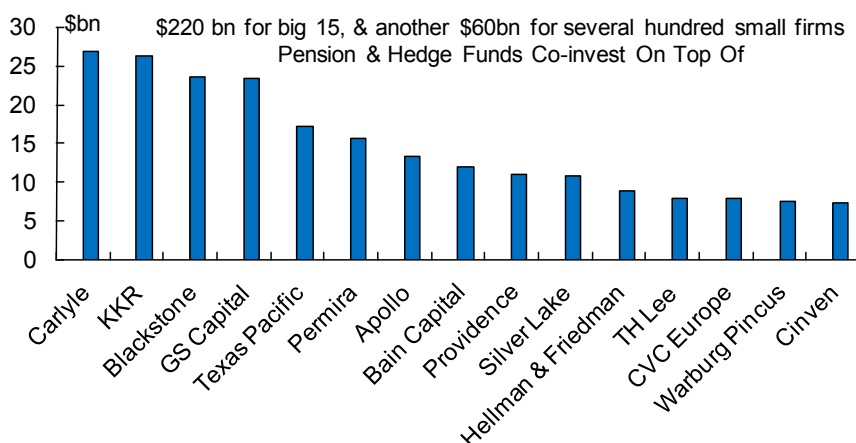
Private equity firms and their size

Capital available to private equity is booming

The main private equity firms are shown in Figure 2. The data are based on H1 2006, and the growth in capital has subsequently been strong. It has to be remembered too that there is currently excess demand for private equity investments (limited partnership pools are quickly filled, and not fully drawn down into LBO investments). So capital can be added to readily.

Figure 2. Major private equity companies

As of H1 2006



Source: OECD

Furthermore, pension funds, hedge funds and other private equity firms can co-invest in deals.

There is no doubt, that while interest rates and spreads are low, the search for yield is accelerating the private equity process.

Which industries?

Industries with stable cash flows are preferred

Industries with more stable cash flow over the economic cycle are attractive to private equity companies. In Anglo-Saxon countries, consumer products (e.g. beverages, tobacco, and foods) and retail companies benefiting from non-discretionary spending are popular. RJR Nabisco (KKR) was the most famous of these (a staggering 1.6% of the S&P market cap in 1989 which has not yet been surpassed in size). The 2006 USD 17.4 billion Albertsons (KKR) takeover by Supervalu is a more recent example. Healthcare is popular as the July 2006 USD 32.1 billion buyout of HCA (KKR) illustrates. Utilities also have this characteristic – witness the KKR Texas Pacific TXU USD 44 billion deal. Selected stable industrials (e.g. Hertz September 2005; Carlyle) with stable monopoly-like markets are also attractive. In the energy area, the US pipeline operator Kinder Morgan was bought out in May 2006 for USD 26.5 billion (Carlyle and others). Semiconductor companies also have stable demand from the explosive growth in the numerous (higher risk) technology companies: e.g. the USD 17.6 billion Freescale deal (Blackstone, Carlyle, Permira, Texas Pacific).

In Japan and Chinese Taipei financials are attractive, as they are less cyclical than is common with investment banks in Anglo-Saxon countries. Semi-conductor companies are also popular in Asia.

Which companies?

Cheap, poorly-performing companies with under-gearred balance sheets are preferred

As with the above arithmetic example, private equity firms seek companies with under-gearred balance sheets, so that recapitalisation adds immediately to yields.

- They choose companies with margins below peers (e.g. because of low productivity, bloated

overheads, or poor operating leverage) which can be improved, or where they can be combined with other companies to achieve cost-saving synergies.

- They choose companies with cheap valuations versus their peers.
- They choose companies with high free cash flow (cash flow after replacement investment) – reflecting the fact that interest payments after the deal will be much higher.

Good companies become harder to find as the cycle matures, so risk in leverage rises

But as the LBO process moves into its mature phase, these companies become harder to find, and the risk of poor (over-leveraged) deals increases. We are entering this phase now.

Performance of private equity funds

As this discussion illustrates, private equity is an agent for rapid structural adjustment and productivity enhancement. While there will always be failures, the financial return evidence to date is broadly favourable for private equity in some geographies.

Private equity returns are solid in the US and Europe, with clear evidence of productivity enhancement

The overwhelming US finding, using Venture Economics data (obtained under freedom of information laws) and data obtained directly from general partners, is that private equity fund returns gross of fees substantially outperform benchmark indexes such as the S&P500.¹

In the Groh *et al.* study,¹ the data are from 1984 to 2004 and cover 133 private equity transactions which closed in 1984 and were completely divested by 2004. Regardless of debt, the sample outperformed (gross of fees), but the sensitivity to the degree of leverage whereby the risk is transferred to the lenders is very strong indeed – the more the risk is transferred by leverage, the better the performance. The correlations with listed securities are so different, that the authors make the point that private equity is a clear separate asset class with great diversification attributes.

1. See Kaplan, S. and A. Schoar, “Private Equity Performance: Returns Persistence and Capital”, NBER *Working Paper* 9807; and Groh, A. and O. Gottschalg, “Risk-Adjusted Performance of Private Equity Investments”, INSEAD *Working Paper*, 2006.

A broad summary of a recent consultant's report to the OECD shows that the US results are not unique – UK and European buyout fund performance has been strong, too.

In terms of real effects, as might be expected, evidence from Continental Europe and the United Kingdom shows that deals enhance productivity (*i.e.* more efficient use of, and the elimination of any surplus, labour).² The complex normative issue concerning the long-run effects of private equity on overall employment in a country lies outside of the scope this paper – these effects depend on interactions between the dynamic benefits of financial innovation on productivity and growth, the impact of competition from the rapidly industrialising BRIC economies (Brazil, Russia, India and China), the nature of public labour market policy and the business cycle.

Investor demand

Investor demand for private equity typically outpaces supply at this stage of the cycle

Given solid performance and the diversifying characteristics of private equity investments, it is not surprising that cornerstone investors such as hedge funds, mutual fund managers, insurance companies and pension funds have sought to increase their exposure to this rapidly growing asset class in their fund allocations.

Investment demand typically outstrips the available supply of private equity products while liquidity conditions are favourable. Failures become more frequent in the mature phase, as interest rates move up (via policy or risk events that push risk spreads out).

With readily available capital from strong investor demand, which is combined with easy access to debt in an environment of low rates and excess liquidity, it is hardly surprising that private equity-led LBOs are booming.

2. See Wright, M., A. Burrows, R. Ball, L. Scholes, M. Meuleman, and K. Amess, *Private Equity and Investor Led Buyouts*, OECD Report, 2007, which surveys some studies on real effects of privatisations.

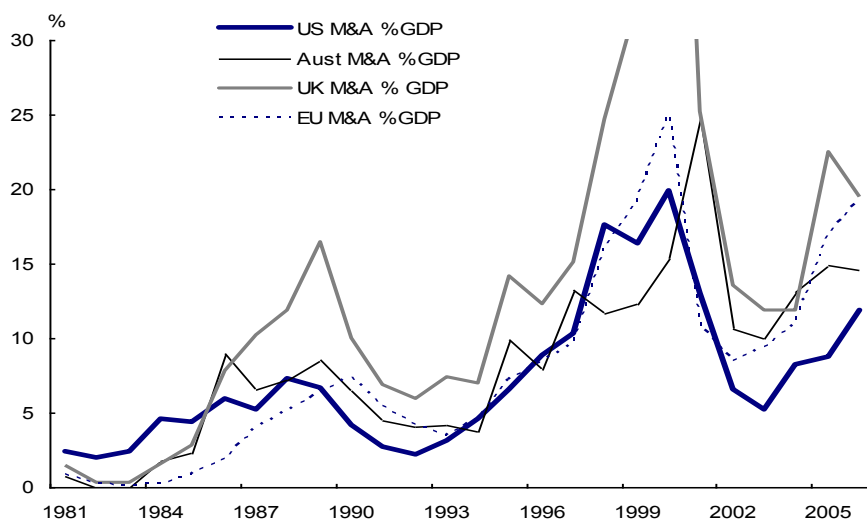
II. Private equity: LBOs are booming

Overall M&A is booming again, but not as strongly as the tech bubble, but LBOs are now back in the excess liquidity environment of late 2000, with deal flow in excess of anything seen before

Figure 3 shows M&A of all forms in per cent of GDP for the United States, Continental Europe, the United Kingdom and Australia. The massive M&A boom in the late 1990s was driven by scrip deals in the tech boom, when scrip acquisitions using massively overvalued paper were common. M&A via scrip in an asset bubble tends to dissociate buyout activity from interest rates. The other two episodes, in the late 1980s and today, are smaller by comparison. But deals at the moment are certainly running at a faster pace than in the late-80s boom.

The deal making is particularly strong in the United Kingdom and Europe. It is difficult to make any qualitative judgment about this observation, as Europe is undergoing massive structural changes in the face of global pressures coming from Asia and Eastern Europe. Private equity is likely to be a highly desirable catalyst to change.

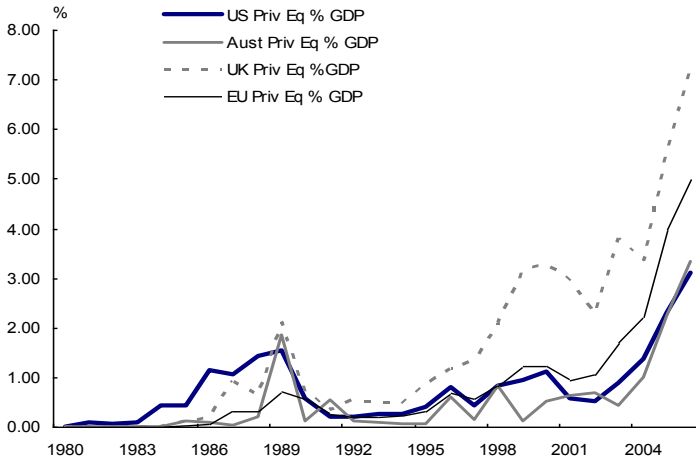
Figure 3. Total M&A selected regions



Source: Thomson Financial.

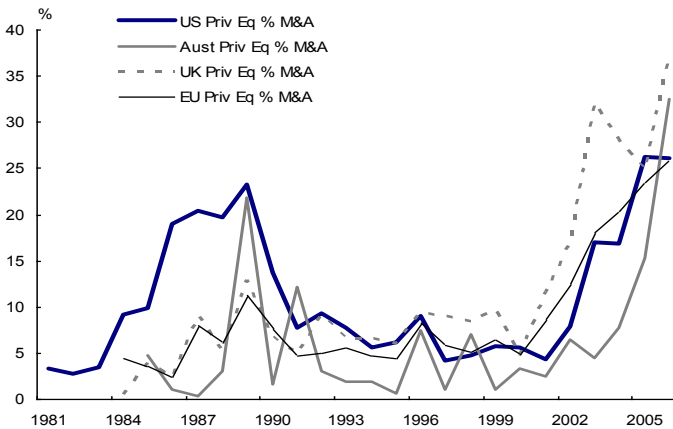
Total private equity in the 4 regions is shown in Figure 4, back to 1980, as a share of GDP. Only 2 periods, the late 80s and today, stand out as major LBO debt phenomena for all regions.

Figure 4. All completed private equity deals in four regions



Source: Thomson Financial.

Figure 5. Private equity in per cent of total M&A



Source: Thomson Financial.

Private equity deals in Europe and the UK are outpacing the US as a share of GDP

The United States was more consistently the largest player in the first LBO boom, but Continental Europe and the United Kingdom are larger this time. The current boom in private equity, as a share of the economy, is much stronger than the previous late-80s LBO boom – which did end in tears and a number of criminal charges by 1991. Private equity deals have begun to branch out recently in a spectacular way to regions like Australia.

Private equity LBOs are 25-30% of M&A at present

As shown in Figure 5, private equity as a share of total M&A is now higher than the late 1980s (around 25-30%).

Causes of the private equity boom: why now?

Markets behave in rational ways in response to the price and regulatory signals they are given.

Why the boom is occurring now

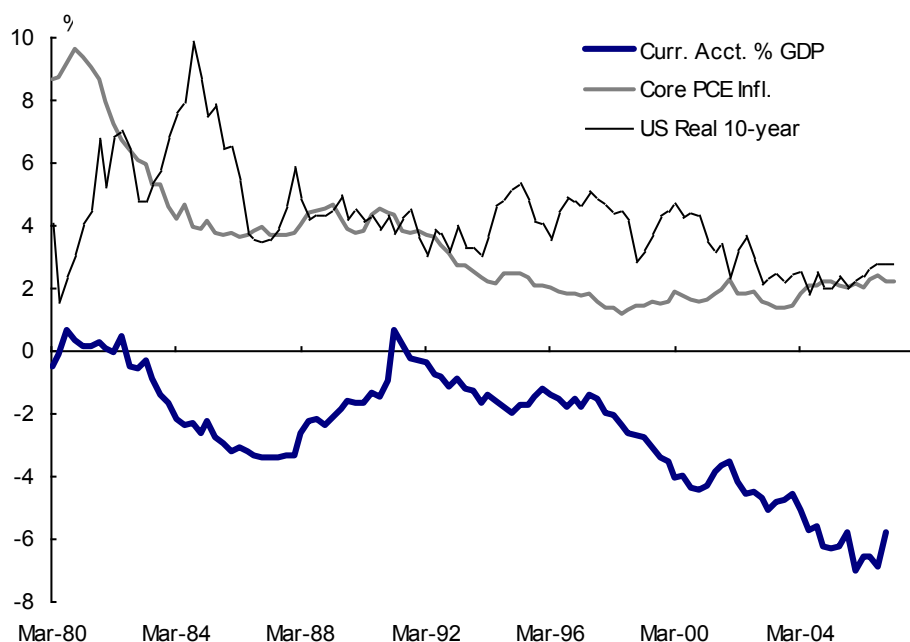
- As debt is involved, a key signal is the level of interest rates and the arbitrage opportunities to which they give rise. This is ultimately an issue of global savings availability and liquidity policies. Liquidity and savings are plentiful, and rates are low, often driven by derivative convergence plays.
- Corporate balance sheets and profits are very strong at present, and are attractive in the search for cash yield, while debt funding is cheap.
- Equity financing was expensive after the tech bust.
- Corporate governance pressures and related requirements have increased, while the ability to reward managers with options has been reduced (Sarbanes–Oxley).
- Short-term performance pressures on fund managers have reduced holding periods of listed equities and made it more difficult for managers of companies to take long-term decisions.
- Asset allocations to this high-performing and low-correlated asset class have increased available capital strongly.

III. The excess liquidity and arbitrage issue

Low rates set up an enormous arbitrage opportunity that is feeding the LBO 'frenzy'

Given the interest rate and other signals set by policy makers, markets behave in very rational ways. Real interest rates are unusually low for this stage of the cycle. At the fundamental level this is due to excess (ex-ante) saving and permissive liquidity policies in parts of the world. Strong demand for long duration assets (in short supply) from pension funds for liability matching reasons is also a factor. Investors respond to these signals. **A massive arbitrage opportunity is set up to borrow at low rates and buy higher yielding assets.** Carry trade activities by hedge funds reinforce the downward pressure on yields. Equity LBOs are a part of the same arbitrage process.

Figure 6. US real 10-year bond, current account and inflation



Source: Thomson Financial Datastream.

Excess savings are one factor in low rates

Figure 6 shows the US real 10-year rate, inflation and the current account. The current account equals the ex-post tapping of excess world saving by the United States. The ex-ante excess saving in the world economy reduces real interest rates, boosting asset prices, demand and imports in saving deficient countries. **In the United States real yields have fallen from 4.7% at the end of the 1990s to around 2.7% in 2007Q1.**

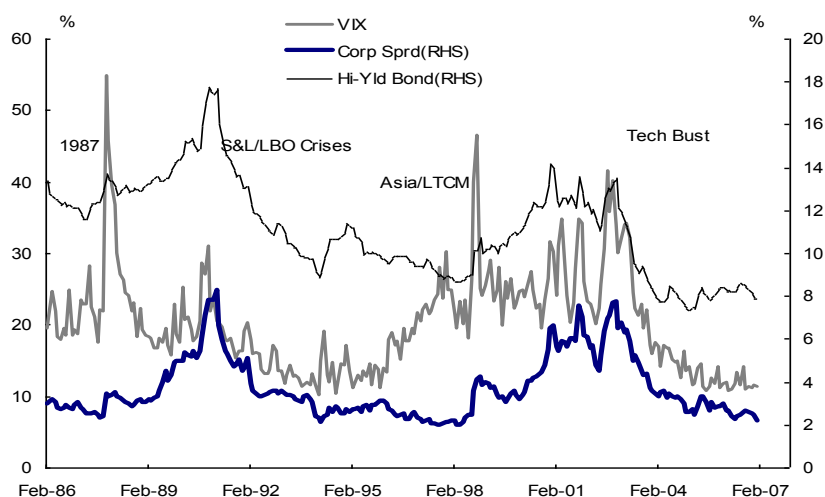
Spread trades via derivatives operate to lower high versus lower risk premium assets – setting up yield convergence

Spread/carry trade activities of hedge funds use derivatives to play the arbitrage opportunities presented. Spread trades are implemented by writing (selling) puts – a bullish strategy that expects narrowing. There is an in-built bias to this strategy. The put sellers receive positive carry – the put buyers receive negative carry. The latter require a major event (reversal) to be profitable (LTCM was such an event in the 1990s). The longer the carry works the more self-reinforcing it becomes. This process results in spread compression across all sorts of assets (high *versus* low risk premium instruments).

The junk bond versus AAA spread is back near all time lows

In previous LBO boom episodes, the spread between junk and AAA bonds has been at historic lows (see Figure 7). This is the case once again.

Figure 7. Volatility, spreads and junk bond yields



Source: Thomson Financial Datastream.

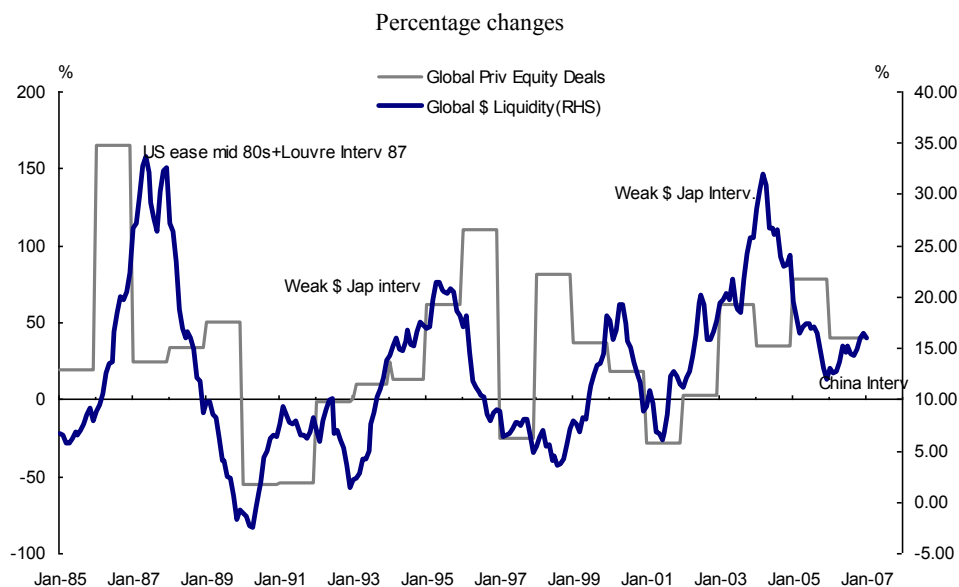
Sources of global excess liquidity

Excess global liquidity has its sources in global distortions

In global financial systems, particularly with the increased role of hedge fund and derivatives, liquidity and financing is not a matter of national monetary policy. It is a basic proposition that if one fixes the price of money in parts of the world economy, one will not be able to control its supply. The re-cycling of this money is an integral part of the arbitrage opportunity that is driving the private equity boom.

The two key prices of money are policy rates (domestic opportunity cost) and the exchange rate (one money in terms of another). Two major prices in the world economy worth noting in this respect are the near zero interest rates in Japan and the fixed exchange rate for the RMB.

Figure 8. Global liquidity and global private equity



Source: Thomson Financial.

***The private equity
deal cycle is correlated
to policy-driven global
liquidity***

Figure 8 shows a simple concept of high-powered global liquidity measured in US dollars (the main financial transaction currency). This is equal to US base money, plus the foreign exchange reserves of the authorities in China, Japan, Asia, the United Kingdom and the euro area – *i.e.* high-powered money for the credit multiplier in the United States plus international reserve accumulation outside the United States which creates domestic liquidity. The US dollar assets are recycled into global (particularly US) debt instruments. The correlation of global policy-driven liquidity with the private equity data is quite striking, and is frequently related to attempts to resist exchange rate pressure in some region. Debt accommodation is a fungible process and financing techniques are innovative: transactions can run quite independently of the domestic monetary policy of the country where the transaction is taking place.

***China is the largest
contributor to this
liquidity at present***

Easily the main contribution to the measure of global liquidity in 2006 is Chinese foreign exchange market intervention. In the 12 months to January 2007, China accumulated a further USD 259 billion in reserves, and the stock of reserves stood at over USD 1.1 trillion. The recycling of these reserves into US bonds is a major factor keeping US rates low. At the same time the fixed exchange rate to the USD and the HKD afford all the usual mechanisms for avoiding capital controls (such as the failure to repatriate foreign currency receipts replaced by domestic loans). Within the Asian region, the ability fully to subscribe start-up investment vehicles quickly at present is well known.

While Japan has intervened less since the US dollar troughed in 2002, zero rates continue to contribute to the global liquidity and spread trades via derivatives that are difficult to measure through standard bank balance sheet flows.

***The private equity arbitrage opportunity
and risks***

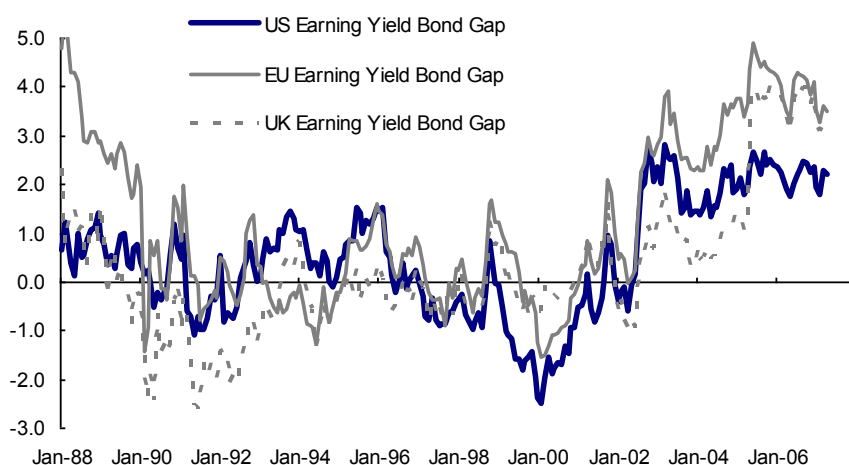
***The arbitrage signals
are favourable to
LBOs***

Figure 9 shows the 1-year forward equity earning yield minus the 10-year bond rate in the United States, Europe and the United Kingdom.

Compared to previous LBO booms, the signal to markets this time is to use debt – has global policy got this right?

In the 1980s bond yields were quite high but equity was very cheap (an expensive funding vehicle) so LBOs were quite strong. In the late 1990s equities were in a bubble and became very expensive (*i.e.* a very cheap funding vehicle for M&A), so scrip deals were the main driver of M&A. The equity-bond yield gap went very negative in this period. In the current boom, it is very clearly an LBO arbitrage environment.

Figure 9. Equity earning yield versus 10-year bond yield



Source: Thomson Financial Datastream.

The LBO boom will go on until equity prices are driven up to the point where equity yields are less attractive than bonds – if yields are too low, this spells trouble

Currently low bond yields mean that debt is a cheap source of funding for acquisitions compared to equities – the earnings yield bond yield gap is as high as it has ever been. Yields on equities, driven by strong corporate profit growth in recent years, are quite attractive relative to bonds. But it is not the case that equities are especially cheap – rather, bond yields are especially low. So in principle, if rates don't change, **LBOs will continue until equity prices are driven up to the point where their yields are less attractive versus bonds.**

It follows, that if bond yields are too low, for the reasons enunciated above, the process will go too far with adverse consequences for investors later on. Since debt is

involved, credit events will follow, and the possibility of financial stability issues later on cannot be ruled out.

Don't shoot the messenger

It is important here **not to shoot the messenger**, as some pundits are wont to do. Private equity is a source of change and market efficiency. It responds to many signals, one of which is the cost of credit in the global economy. In this respect, policies that distort the global price of money in various jurisdictions are an important element in the acceleration of the private equity process.

Increased risk in deals rise as the cycle matures

In the sectors where private equity is focused, it is getting much harder to find good deals – but with low rates the process goes on, so risk rises

The UK Financial Services Authority (FSA) has calculated that UK deals to which banks committed capital were carried out at an average PE of 14 times in 2006, versus 11 times in 2005. This means that the PE cost of funding gap is closing in the industries and companies of interest to private equity companies. Private equity companies are paying higher prices for the right to apply their skills, so that simple changes in the capital structure may not be enough to generate good returns (*i.e.* the under-gear/under valued 'easy' sources of return), and much more will turn on the operational change phase of the process. Similar processes are under way in Europe. Table 2 shows earnings yield–bond yield gaps for the overall market and for the LBO sector, for Europe and for the United Kingdom.

Table 2. Yield gaps LBO sector versus the market

	Av Mkt PE	Av PE LBO	Av Bond	Yld Gap Mkt	Yld Gap LBOs
UK					
2005	13.9	11	4.4	2.8	4.7
2006	12.3	14	4.4	3.7	2.7
EU					
2005	13.2	17	3.4	4.2	1.7
2006	13	18	3.7	4.0	1.6

Source: UK Financial Services Authority; Thomson Financial Datastream; Wright *et al.*²

Mega-caps distort the aggregate picture

This suggests that the aggregate equity market index yield *versus* bonds for the United Kingdom and Europe may exaggerate the signal for LBO arbitrage, because the broad indexes are dominated by mega-cap companies. Good value does still exist in mega-cap companies, but they are too big for LBO buyouts by private equity. The under-performance of mega caps has continued of late. The ten largest stocks in the main indexes (too large to be taken by private equity) have underperformed by a staggering -6.6% in the United States, -11.1% in Europe, -6% in Japan, and -8.9% in the United Kingdom over the six months to the end of March 2007, as private equity deals have accelerated.

Within Asia ex-Japan, LBO activity has been less because of the bubble-like growth in share prices and very low historical dividend yields that make scrip driven M&A more attractive. Internal rates of return (IRRs) are just too poor in most companies to make a debt-driven transaction attractive.

Deals are spreading to less appropriate industries

In Anglo-Saxon countries and Europe, deals are spreading to industries such as airlines that are inherently more cyclical and exposed to risk factors (*e.g.* oil prices and terrorism), or are looking more at banks and utilities, where perceived public policy ‘put’ comfort factors may be present.

Financial stability issues arise from concentrations of leverage

Financial stability issues arise from concentration of leverage risk, not from the average market picture. As the cycle continues to mature, making LBOs work gets increasingly tougher, and so leverage becomes more risky. Markets are only continuing to respond to signals with the profit motive in mind. But are the signals they are responding to appropriate?

Removing distortions to interest rates should be the primary focus of ‘global’ policy, but domestic concerns sometimes override this

The policy focus from a global perspective should be on raising interest and exchange rates that are too low at present. But domestic considerations in the countries concerned may delay this process.

This raises the issue of what else might be done to reduce financial risks (without unnecessarily restricting markets).

Fees, securitisation and re-financing issues

Strong investor demand and pressure to find deals

With low rates, strong corporate profits and confidence in the economic outlook, pressure to find LBO deals is strong – as the capital available to private equity is accelerating (given the strong demand to invest in this asset class). Sponsors are likely to raise bids in order to win deals against other consortiums. This drives up stock multiples.

Up-front fee moral hazard

The up-front fee structure on the deals is a huge incentive – 2% of the total value of the deal is common, and can be higher, with 20% of the upside in performance fees to follow. Moral hazard may arise to get the deal done, and possibly to take on too much leverage, particularly when interest rates are distorted at too low levels.

Refinancing can be used to lock in investor profit of a successful LBO – this involves injecting more debt into the firm to pay dividends to equity holders. The removal of downside risk may come at the expense of a sustainable capital structure and risks to the ultimate solvency of the company in the exit phase. These problems may be compounded, if the manager becomes less focused on a company because the downside risk has been removed.

Fund manager refinancing to lock in profits and remove downside risk

Refinancing can also be used to avoid putting more capital at risk in an LBO that is not working well – a ‘last roll of the dice’, particularly if credit conditions are favourable. These activities build in a non-linearity – keeping a company going that should go bankrupt in good times and seeing it go under when interest rates rise.

Bank exuberance to get the deal done for fees and shift the risk via securitisation

On the financing side, deal sponsors approach different banks and brokers for initial underwriting and subsequent debt issuance. As this is a profitable fee-rich business, there is an incentive to give favourable terms to win the business. Banks typically hold the debt on their balance sheet for only a short period of time, and then securitise it in the debt markets, so the economic risk is transferred away. Banks may be less focused on ‘kicking the tyres’ and credit quality than getting the deal done. Risks may be under-priced as the search-for-yield-mechanism sees strong demand for debt instruments across the investor universe.

Private equity principals often have strong relationships with investment banks, forcing partner banks to better deals on offer from competitors to protect relationships.

Policy issues

As deal multiples become more inflated the increased risk in deals is a policy concern. To the extent that domestic concerns in some countries will delay the removal of distortions to global financial price signals, there may be an urgent need for more risk assessment and stress testing within the private sector.

Need for better stress testing, given the low rate environment, before recommending buyouts to shareholders and staff

One important issue here is that the companies themselves need to be encouraged strongly to stress test debt exposures that might arise from an LBO bid before recommending any deals to shareholders. The board needs to fully understand what the interest cover might look like at more normal cost of capital levels. It also needs to explore the sensitivity of demand and supply circumstances in their industry to the potential impact of higher interest rates, oil prices, etc. over a full cycle. Shareholders and employees should demand this sort of due diligence.

Banks and rating agencies need to maintain strong credit checking processes

Similar issues arise for financial intermediaries. Banks need to ensure that credit standards remain high, regardless of the transfer of risk via the securitisation process. Credit rating agencies, too, need to ensure that high standards apply as this process becomes ever more complex.

Bank exposure stress testing is critical

There is a greater need for authorities to emphasise the need for stress testing: for direct balance sheet risks; for counterparty risks in the trading of LBO debt securities; and for crisis scenarios (including the potential for surprises in the interpretation of low covenant loans, etc., will behave in a credit event situation).

The previous LBO boom ended badly

The urgency of reducing the risk of major credit events at this stage of the cycle needs to be stressed. The late 1980s LBO boom ended badly. It reached its zenith with the giant RJR-Nabisco deal in 1989, a record USD 25 billion. That was a huge amount to absorb, and things slowed rapidly from then. The LBO'd retailer Campeau got into a liquidity crisis, and that triggered a fall in the market. In January 1990 RJR's debt was downgraded, and in

February the lead underwriter in junk bonds, Drexel-Burnham-Lambert filed for bankruptcy. Spreads blew out, and the junk bond interest rate soared. Default rates rose, and large numbers of LBO companies were forced into negotiations with their creditors. The consequences for the economy were unpleasant to say the least.

IV. Issues concerning standards of practice

Inside information used to under-pay existing shareholders

Private equity has developed in part due to a desire to escape the rigors and attention of being listed on the share market and legislative constraints affecting remuneration (e.g. Sarbanes-Oxley in the United States). While this behaviour is consistent with market efficiency, questions do arise concerning the appropriate rules of the game. For example, it was remarked earlier that the returns from private equity have been very good indeed – and in a simple arithmetic example, without extreme assumptions, exit capital gains could be astoundingly strong. This could be due to the greater skill of the private equity managers. But it could also be due to relatively straightforward changes to the capital structure of the company, and operational changes that could be carried out by existing management for the benefit of existing shareholders (remember that most LBOs are friendly and keep top managers). In other words, the existing shareholders can be badly advised by their board, and underpaid for their assets, particularly in the early stage of an LBO cycle. This is most likely to occur if managers and the board are conflicted by equity incentives.

Inducements to directors/managers to recommend a bid – balance between commerciality and misuse of private information

It would seem to be inappropriate for private equity representatives to discuss equity rewards for key individuals and directors in exchange for recommending a buyout deal to shareholders – private information is kept back from the shareholders and broker company analysts prior to the announcement of a bid, and the moral hazard of personal return is introduced at an inappropriate stage. This is a transparency issue, where the right balance between commercial confidentiality and misuse of information needs to be achieved. Guidelines for fair and reasonable practice in this area would not hurt.

Insider trading is common: share price movements and credit default swap shifts prior to the public announcement of a deal

The way the deals occur also mean that executives of the target company, their advisers, their bankers and other private equity firms approached get inside information about a bid and may deal in the share price. It is common to see share prices move well before a bid is announced. It is also interesting that there is less regulatory focus on the credit markets. It is very common to see credit default swaps move sharply before a deal is announced – clearly, if a private equity bid is coming, a large amount of debt will be issued in the company name with risks to ratings, etc. In some countries the requirements of the law to prosecute these cases are so demanding that little can be done.

Conflicts resulting from multiple activities

‘Chinese wall’ issues

Private equity fund managers typically commit their own capital to the pools of capital under their management, aligning their interests with partners. However the use of co-investment vehicles to make additional investments raises the risk that managers can cherry-pick more lucrative deals and allocate them to the funds in which they have greater exposure. Strong industry codes of practice are needed to avoid this sort of behaviour.

In some cases private equity funds run in-house hedge funds at the same time. It is unclear how ‘Chinese walls’ are or are not used in the potential transmission of information (e.g. credit quality of the debt, impending LBO deals, etc.). It is possible that the hedge fund could be used to warehouse debt that other investors did not want, to benefit the private equity fund at the expense of the hedge fund investors, or vice versa. Full transparency on this issue is required to ensure a level playing field.

These issues are raised to illustrate that the sector is unregulated in many jurisdictions and the absence of mark-to-market discipline means that appropriate governance relies on reputation alone over the longer run.

Implicit ‘puts’

*Lender of last resort,
deposit insurance,
regulatory change
comfort factors*

Some sectors of the economy benefit from implicit ‘puts’ – that if something goes wrong, policy will adjust to avoid bankruptcy or other failures. Banks are a clear example, with lender-of-last-resort and deposit insurance.

Public utilities like gas, water and electricity may also evoke favourable regulatory responses if the alternative is a risk to the availability or quality of services.

In these cases there may be a distortion of deal flow due to the comfort factor provided by the nature of the industry, resulting in excess leverage.

Policy issues

Private equity is an alternative model to public companies that plays a unique role in helping transform companies and remove inefficiencies. The main differences are shown in Table 3.

Table 3. Summary of major differences of public versus private model

	Capital Structure	Ownership Structure	Operational Issues	Earnings Performance	Compensation Incentives	Corporate Governance
Public Co Model	*Low leverage tolerance	*Retail & insto mix, with low operating influence. *Pressure on instos to perform in s/run	*Continued investment to expand *Reluctance to major divestitures	*Market pressure to meet Qtly or 6-monthly performance	*Options gone post FAS 123 *More limited upside for management Intense public scrutiny	*Frequent investor meetings *Guidance to analysts *Relationships with analysts *Mark-to-market discipline
LBO Firm Model	*High leverage 5 to 8 x EBITDA	*Financial sponsors have major ownership & role in the business	*Stringent cost reduction *Sale of non-core assets	*Longer-term focus to max value for eventual exit from private model	*Significant ownership & upside potential for management. *No public reporting.	*Reduced pub. discl. *Analysts & investors can't get info. on deal *Fee structure & incentive moral hazard *Potential misuse of priv. information Refinancing profit lock in *Transfer of risk via debt and securitisation.

Source: OECD.

There are numerous possibilities for conflicts of interest to emerge at the micro level. Strong self-regulation via cross-border industry codes of practice would help provide more transparency and avoid the misuse of private information.

A better ability to prosecute insider trading issues may also need further thought.

***More focus on upside
for the company than
upside for managers***

Rewards in private equity that are more focused on the upside at the exit stage, rather than on up-front fees and refinancing lock-ins of profit, would reduce conflicts of interest. The market is the best mechanism to do this, but the share market is not engaged to enforce discipline. Clear transparent and regular reporting to investors plays helps, enabling limited partners to have sufficient information to take action through the courts, if their interests are not being served.

Better cross-border guidelines for ‘sound market practice’ in private equity deal making could be a worthwhile exercise.

The Role of Private Pools of Capital in Corporate Governance: Summary and Main Findings about the Role of Private Equity Firms and "Activist" Hedge Funds

OECD Steering Group on Corporate Governance

In November 2006, the OECD Steering Group on Corporate Governance initiated a study of the role of privately organised pools of capital ("alternative investment vehicles") in corporate governance. With a rapid increase in the size of transactions and investments, and partly due to differences in corporate governance frameworks and company structures, there has been a growing public interest in private equity firms and "activist" hedge funds. The Steering Group agreed that the distinct corporate governance aspects that emerge in these discussions required special attention based on the OECD Principles of Corporate Governance (OECD Principles). This Report summarises the main conclusions reached by the Steering Group in April 2007, including the findings of a factual review that were taken into consideration.

On the basis of available evidence, the Steering Group concluded that "activist" hedge funds and private equity firms could help strengthen corporate governance practices by increasing the number of investors that have the incentive to make active and informed use of their shareholder rights. It was agreed that, from a corporate governance perspective, there was no need to promote a special set of principles for private equity firms and "activist" hedge funds, but that the opportunities and challenges that follow from their ownership strategies should instead be analysed within the general framework of the OECD Principles, also taking into account existing voluntary standards established and promoted by the industry.

The Role of Private Pools of Capital in Corporate Governance: Summary and Main Findings about the Role of Private Equity Firms and "Activist" Hedge Funds

OECD Steering Group on Corporate Governance*

I. Background and main conclusions

***OECD Steering
Group on Corporate
Governance initiated
a study of the role of
“alternative
investment vehicles”
in corporate
governance***

In November 2006, the OECD Steering Group on Corporate Governance initiated a study of the role of privately organised pools of capital (sometimes referred to as “alternative investment vehicles”) in corporate governance. The Steering Group’s inquiry is focused on those private equity firms and hedge funds that pursue investment strategies that explicitly aim at increasing the value of their pooled capital through active engagement with individual, publicly held companies. While the terminology may not be perfect, these investors are referred to as private equity firms and “activist” hedge funds. As a consequence, the inquiry is limited to a relatively small subset of privately organised pools of capital and does not cover other policy aspects, such as financial stability or the participation of retail investors in private pools of capital.

* This summary was prepared by Grant Kirkpatrick, and approved by the OECD Steering Group on Corporate Governance as representing the consensus reached at its meeting on 16-17 April 2007. The discussions were based on a background document on *The Implications of Alternative Investment Vehicles for Corporate Governance*, prepared by Grant Kirkpatrick and Janet Holms, and its Annex, a consultants’ research report. A revised version of these documents is being published at the end of June.

Growing public interest about the corporate governance aspects of private equity firms and “activist” hedge funds requires special attention...

The Steering Group recognises that financial stability and investor protection are also important since sound financial markets are important for promoting good corporate governance practices. Nevertheless, at this stage of the debate, the Steering Group considers it more appropriate to focus on its area of specific expertise and experience in the area of corporate governance, leaving the broader issues to be considered by other specialised fora.

While private equity firms and “activist” hedge funds have been operating for some time in both the UK and the US, they are comparatively new in many other jurisdictions where they have been subject to increased attention, partly due to differences in corporate governance frameworks and company structures. With a rapid increase in the size of transactions and investments, there has been a growing public interest also in the US and the UK. The Steering Group agreed that the distinct corporate governance aspects that emerge in these discussions required special attention based on the OECD Principles of Corporate Governance (OECD Principles).

This Report summarises the main conclusions from the Steering Group’s meeting on 16-17 April 2007, including the findings of a factual review that were taken into consideration. A full version of this background report is being released late June 2007.

...based on the OECD Principles of Corporate Governance

In developing their conclusions, the Steering Group drew on principle I.A of the OECD Principles: *The corporate governance framework should be developed with a view to its impact on overall economic performance, market integrity and the incentives it creates for market participants and the promotion of transparent and efficient markets.* This meant that the Steering Group considered not only the direct actions of the investor categories being considered (in relation to the OECD Principles), but also the available empirical and analytical work about the impact on economic efficiency and the adequacy of the corporate governance framework in which these investors operate.

The Steering Group concluded that “activist” hedge funds and private equity firms could help strengthen corporate governance practices

On the basis of available evidence, the Steering Group concluded that “activist” hedge funds and private equity firms could help strengthen corporate governance practices by increasing the number of investors that have the incentive to make active and informed use of their shareholder rights. This may include demands for changes in management, the composition of the board, dividend policies, company strategy, company capital structure and acquisition plans. Such active and informed ownership is expected to stimulate the search for the best possible use of corporate assets and thereby contribute to better risk and resource allocation in the economy as a whole. Promoting efficient outcomes for actions taken by active and informed ownership is therefore likely to remain an important policy objective for the years to come. To this end, the Steering Group discussed the potential implications for some areas of the OECD Principles, notably: the efficiency of the market for corporate control (including takeover regulation), transparency requirements, the reliability of voting systems and the monitoring/management of conflicts of interest through the exercise of fiduciary duties by management and boards.

No need to promote a special set of principles for private equity firms and “activist” hedge funds

It was agreed that, from a corporate governance perspective, there was no need to promote a special set of principles for private equity firms and “activist” hedge funds. The opportunities and challenges that follow from their ownership strategies should instead be analysed within the general framework of the OECD Principles. The analysis will also take into account existing voluntary standards established and promoted by the industry.

II. Focus of the study and size of the industry

It is hard to define the differences between activist hedge funds and private equity and between these investors and other investors

The Steering Group’s attention is focused on those self-described private equity firms and hedge funds that pursue investment strategies that explicitly aim at influencing corporate behaviour and organisation of publicly held companies. This Report refers to these investors (or investment strategies) as private equity firms and “activist” hedge funds respectively. The Group recognised that legal definitions of these two types of investors are not

forthcoming and that other categories of investors pursue similar investment strategies and use similar financial techniques to support investment strategies such as hedging, leverage and share borrowing. Moreover, not all private equity firms and far from all hedge funds pursue such strategies. This difficulty of definition is an additional reason to focus on the effects of the increasing role of private equity and activist hedge funds on the robustness and effectiveness of the overall corporate governance framework rather than developing corporate governance regulations addressing specifically the behaviour of these investors.

***“Public-to-private”
strategies are a focus
of this Report***

The business model of private equity firms and “activist” hedge funds can be summarised as seeking to increase the market value of their pooled capital through active engagement with individual public companies. This engagement may include demands for changes in management, the composition of the board, dividend policies, company strategy, company capital structure and acquisition/disposal plans, which are normally regarded as corporate governance issues. The investor may also take a public company private for a period of restructuring before either returning it to public ownership or by selling it to another company. This “public-to-private” strategy is typically associated with private equity firms (it has been adopted by a few activist hedge funds, too) and is the form of private equity transaction covered by this Report. In line with this focus, the Report does not cover, for example, private-to-private deals by private equity firms.

***“Activist” hedge funds
are only a small part
of the capital market***

Although there is little to prevent a migration of hedge funds to the activist strategy, the number of activist hedge funds in the global economy is probably only about 100-120 with funds under management of around USD 50 billion (excluding leverage). If all funds pursuing “event-driven strategies” were to be included, the sum would rise to about USD 200 billion and perhaps to some USD 1-1.5 trillion if high leverage is taken into account. By way of comparison, the global mutual funds industry alone has USD 18 trillion under management.

Record levels for public-to-private transactions in 2006 involved larger companies and more employees, but conventional mergers and acquisitions remain more significant

The value of public-to-private buyouts surged to a record USD 120 billion in the USA in 2006 from around USD 85 billion in 2005, about 1.5% percent of GDP. Outside of the US, the figures are very sensitive to a few large transactions. In the UK, public-to-private transactions amounted to GBP 7.2 billion in 2005 falling to GBP 5.8 billion in 2006 (around 1.75% percent of GDP) with just 24 transactions and none involving a FTSE 100 company. In Continental Europe, transactions amounted to EUR 25.7 billion in 2006 from 16 transactions but almost 85% came from two large transactions in Denmark and in the Netherlands. In most OECD countries, the level of public-to-private transactions remains well under 1% of GDP. The transactions also need to be viewed against the background of a mergers and acquisitions boom: in 2006, public-to-private buyouts accounted for only 20% of total mergers and acquisitions, albeit up from around 10% in 2001.

The average share of debt in financial structures varies markedly across deal sizes with larger deals having the higher shares. Among the very largest deals, the average combined share of financing structures accounted for by debt has increased from 55% in 2000 to 67.3% in 2006.

Public-to-private transactions sometimes involve very large publicly held enterprises and the size is tending to increase. This also means that the work forces are correspondingly significant. In 2003, 450 000 employees were involved in new European deals. In 2005, the figure reached 850 000, although biased by one large transaction in Denmark. The larger deals often involve a number of funds. There are some indications pointing to coordination problems with “clubs” of private equity funds, suggesting that they are also starting to experience coordination problems similar to public company shareholders.

III. The role of active investors

Any addition to the pool of informed and active investors is positive for corporate governance

The Steering Group concluded that in the presence of perfect capital markets there would be little scope for a special category of “active” investors, like private equity firms and “activist” hedge funds. However, when markets are not perfect but characterised by information

asymmetries and costs of collective action, managements might pursue their own goals and interests rather than those in the best interest of the company and its shareholders. In these circumstances, there is an important role for “active” investors with incentives to invest in both acquiring and using information. Capital markets around the world are, however, increasingly dominated by institutional investors that often adopt passive investment strategies. These strategies include index-tracking rather than stock picking. There is also a collective action problem made worse by the side-effects of prudential regulation that limits the share of equity held in a company by some institutional investors. As the OECD Principles note, limiting the proportion of equity held in a company reduces the private returns from monitoring the corporate governance arrangements of a company and in exercising shareholder rights. In such a situation, activist hedge funds that are not constrained in their shareholding levels and that have strong incentives to exercise their shareholder rights could improve the overall efficiency of capital markets and underpin good corporate governance.

*Active ownership
functions as an
incentive for
improving corporate
governance practices*

The OECD Principles call for an efficient and transparent market in corporate control which will counter-balance any tendency for management and boards to weaken their accountability to the company and to its shareholders. The Group recognised that active ownership functions as an incentive for improving corporate governance practices. In this context, private equity transactions and “aggressive” demands *vis-à-vis* the management, or indeed the threat of such actions (where they do not undermine market integrity), could make a contribution to improving corporate governance and also to improving economic performance.

*The case of short
termism*

It is sometimes suggested that activist strategies weaken corporations by directing resources away from long-term, value-creating strategies, which are the ultimate objective of good corporate governance. This point of view is associated with other propositions including a belief that the economic and corporate governance frameworks together foster short termism rather than patient, long-term investment by “real owners” that leads to improved economic performance. The period of engagement by

activist investors of some 2-6 years is often taken as proof of the “short run” proposition.

The claim is closely related to a long running debate about the degree of market myopia and about whether and under what circumstances markets are likely to be strongly efficient (“perfect foresight”). Empirical work suggests that while markets are not necessarily perfect, longer term factors are valued even in markets characterised by short-run behaviour: equity valuations tend to reflect corporate investment activity and price/earnings ratios imply long term considerations of often around 15 years. Research and development (R&D) investments and related innovation strategies are also incorporated quite rapidly into market valuations. Even if investors as a whole might be myopic, the literature indicates that a small pool of active investors looking at long-run prospects are key to market performance even if the same investors will only invest in the company for a limited period. Hence, at least in cases where these market participants consider long-term prospects, reference to the investment horizon of an investor class does not say much about the efficiency of the market and long-run economic performance.

Lack of a credible long-term strategy makes a company a target for active investors

Available empirical research suggests that it is the lack of a credible long-term strategy that makes a company a target for active investors in the first place, especially when it has large cash reserves and is unable to communicate a credible investment strategy. It is not surprising that corporate strategies that have been developed to make companies less attractive to private equity firms and “activist hedge funds” typically highlight the need for the company to: (a) have an informed board; (b) communicate a viable long-term strategy to market participants; (c) review the capital structure; (d) establish a clear dividend policy, etc. That is to say, even in response to investors with a limited time horizon, companies are encouraged to make sure they meet standards that are commonly associated with good corporate governance.

IV. New ownership practices and the OECD Principles

How well does the corporate governance framework accommodate new ownership practices?

The OECD Steering Group agreed that there is scope to analyse the specific issues that relate to the behaviour of private equity firms and “activist hedge funds” within the framework of the OECD Principles. In line with the OECD Principles, this analysis should be made with a view to overall economic performance, market integrity, incentive structures for market participants and the promotion of transparent and efficient markets. Areas where deviations, shortcomings and/or stresses in the corporate governance system may appear include: (a) the integrity of voting systems; (b) the efficiency of the market for corporate control; (c) transparency; (d) market integrity; and (e) controlling potential conflicts of interest among managers, board members and shareholders. Going forward, it should be noted that some of these issues are addressed by voluntary standards developed and promoted by the industry. It will also be useful to obtain a better empirical understanding of practices beyond the US and the UK, which are the two dominant markets for private equity firms and “activist” hedge funds, in order to also analyse the role of these new forms of activism in systems characterised by different models of ownership structures and control mechanisms. It would be interesting, in particular, to investigate if there is room for a positive role for active investors to play in the corporate governance of companies with a high level of ownership concentration and in more bank-oriented financial systems.

“Activist hedge funds” seek to influence corporate behaviour without acquiring control...

“Activist hedge funds” use a range of strategies, usually founded upon ownership of relatively small but nevertheless significant voting stakes in companies and the threatened use of voting rights, often combined with public campaigns for change. They sometimes use derivatives (or other financial techniques such as share lending) to boost their voting power at a relatively low cost and often solicit support successfully for their reform programmes from other private pools of capital and more traditional institutional investors. From this position, they make corporate governance demands on boards and management from a position of strength. Their demands often target the company’s operational strategies and use of capital. They

may also seek changes in corporate governance structures and policies where it appears that shareholders' ability to exercise key ownership functions (such as to elect and remove board members) has been restricted. Their success rate seems to be impressive with several studies indicating rates of 60-75% in preventing mergers or supporting takeovers, changing CEOs and board composition, and in altering the capital structure of a company through share buybacks, etc. There is no evidence that such firms have been damaged for short term gain by an activist investor.

...which puts the voting systems to a test...

Hedge fund activism has led to more closely fought corporate votes, *e.g.* in board elections and contests for control in some jurisdictions. In a few jurisdictions, these battles have raised questions about the integrity and efficiency of the existing mechanisms to identify, process and execute voting rights. This problem seems to have been accentuated when "activist hedge funds" make use of share lending close to a proxy contest or shareholder meeting in order to increase their influence. While there is nothing inherently problematic about share lending, it has put the voting system to a test and appears to have resulted in cases of over-voting in a few jurisdictions. This will of course make the outcome of close contests difficult to judge and challenges the principle of equitable treatment of shareholders. Another issue concerns activism in cases where the shareholder turnout at annual or extraordinary general meetings is low. The first, best solution in this case is to remove the barriers to shareholder participation.

A practice that has received a great deal of attention by academics is so-called "empty voting" but in practice it does not appear to be widespread. This happens, for example, when the economic interest in a share (*i.e.* the risk held in a company) is hedged or in effect sold so that the voting right is all that remains. Empty voting is not the exclusive domain of hedge funds. Management might use this technique to transfer the economic risk of ownership while retaining voting power to facilitate entrenchment. A majority shareholder might use the technique to maintain control while minimising its exposure to the company. A few hedge funds using this strategy have attracted attention when it puts them in a potential conflict of interest relative to other shareholders. This could happen, for example, if a

hedge fund that has an interest in both the acquiring company and the target company fully hedges its exposure in the acquiring company and publicly comes out in favour of the acquisition even though the purchase price overvalues the target company. Similar conflicts of interest between shareholders have arisen in the past, so the issue is not a new one in company law, but managing this situation can become more problematic with the increasing importance of new active investors and with continuing financial innovation.

While the problems connected with these practices can be very relevant, it seems necessary to carefully consider the effects of any possible policy actions on the development of capital markets and on the effectiveness of corporate governance discipline. An adequate balance among different needs could be reached mainly through increasing transparency rather than prohibiting or hampering these new practices. In any case, costs and benefits of any “selective” rule should be carefully evaluated, once market failures have been clearly identified.

...and may call for improvements in related regulatory provisions for disclosure

In the course of building up their ownership stakes, “activist hedge funds” are subject to laws of general application requiring timely disclosure, consistent with the OECD Principles. These take the form of disclosure once certain ownership thresholds have been reached (e.g. 2%, 5% or 10%). In some jurisdictions, detailed disclosure must also be made regarding the blockholder’s intentions and its arrangements with the company or other shareholders. While originally introduced to control takeovers by stealth, such requirements have served to improve transparency and discipline in the market for corporate influence. Questions have arisen in some jurisdictions, however, about whether existing requirements: (a) fully and consistently encompass the kinds of economic and voting interests that can be created through derivatives transactions; and (b) are set at the optimal threshold for these new market conditions where it is possible for investors to exert significant influence without having or seeking control.

In executing their value creation strategy, “activist hedge funds” typically rely on the support from other investors with whom they might consult and often use

public declarations rather than private negotiations with management. Communication and coordination between investors is advocated by the OECD Principles subject to safeguards regarding market abuse. The opportunity for market abuse and especially insider trading and abusive self-dealing appears to be a significant concern at times and in some jurisdictions and would not be compatible with the OECD Principles that advocate equitable treatment of shareholders. An appropriate regulatory framework and effective oversight in this area are particularly important, given the powerful incentive structures for hedge fund managers.

Private equity is a major force in public-to-private transactions...

Private equity firms apply a wide range of different and complementary strategies including financing public and private companies and the provision of venture capital. As mentioned above, this Report is concerned with transactions where publicly held companies are taken private, so-called public-to-private transactions. The objective of such transactions is typically to restructure the company, improve the use of corporate assets, increase its value and sell it again at a higher price. The pooled capital that is used in this process is typically locked-in for a period of ten years and levered by taking on debt, often at a ratio of about 3:1 depending on the type of transaction.

...which requires an efficient and transparent market for corporate control

The process of taking a public company private involves some key corporate governance issues covered by the OECD Principles. The review of current practices undertaken by the Steering Group points to several potential concerns that deserve special attention. These are primarily related to the requirement that the “markets for corporate control should be allowed to function in an efficient and transparent manner”. A related issue concerns the fiduciary duties of board members and management, since they are often a party to the takeover and therefore conflicted. One study of fifty large public-to-private transactions in the US showed that 34% of the boards of target companies did not form an independent committee to evaluate, negotiate and approve the proposed transaction. Questions about whether boards have fulfilled their duties to the shareholders in general and to the company have also arisen with a number of transactions in other jurisdictions.

Compensation structures might also be an issue and might raise specific problems with regard to the integrity of management and board behaviour as defined by the OECD Principles. For example, it appears that in some cases options for managements and board members might vest in the case of a successful takeover, leaving the suspicion that they might be disposed to accept a takeover (*i.e.* “throw in the towel”) even if the transaction does not maximise value for shareholders and the company. Pension funds and other institutional investors might also be disposed to lock in a cash gain. In combination with the recent tendency to form private equity clubs to bid for large firms, there is often a perception that despite high acquisition premiums of 30-40%, some companies are being sold too cheaply.

Other concerns can arise, from an opposite point of view, where the fluidity of the market for corporate control is hampered by regulations or practices which over-protect and lead to the entrenchment of management. While public-to private transactions are often uncontested by the board and management, the OECD Principles recognise that an efficient market for corporate control requires that anti-take-over devices should not be used to shield management and the board from accountability. It cannot be excluded that the presence of such anti-take-over provisions may limit the number of companies that may otherwise be the target of “activist investment strategies”.

V. Drivers of private equity, performance and employment effects

Only some companies attract private equity investors

Empirical work suggests that the typical target for a public-to-private transaction is likely to be undervalued, with high cash balances and a relatively low level of debt. Since the transactions are rarely “hostile”, there will also be a potential for close relations with management and the board, many of whom have significant equity positions and will be favourable to the transaction. In the UK, companies that are subject to public-to-private transactions have a significantly higher default probability prior to being bought-out than other companies. This is not the case in the US where the probability of a public-to-private transaction is actually lower when there is potential financial fragility.

Tax arrangements can drive transactions but are not the sole factor

The Steering Group was also interested in the role of taxation in public-to-private transactions. On average, pre-transaction shareholders in the target company of a public-to-private transaction receive a premium of approximately 40%. In trying to determine how tax influences the premium, studies for the US and for the UK come to different conclusions, although it should be noted that the research covers different time periods. Older research in the US suggests that the tax effect might account for between 20-70% of the premium depending on the structure of the transaction. In the UK, the fact that higher premiums are paid for firms with lower leverage provides weak support for the tax benefits hypothesis. The unused debt capacity is likely to create a large additional tax shield. However, the tax system is important in other ways than just through corporate taxation of the target company.

Taxation of private equity partners and of limited liability partnerships differs from one country to another and can encourage or discourage investment activity through private pools of capital. The treatment of capital gains is also important, especially for the general partners (*i.e.* carried interest). In some countries there appears to be a contradiction between taxation incentives to encourage venture capital on the one hand, and the desire to discourage private equity involving public-to-private transactions on the other hand.

Exits by private equity are a critical part of the process

A key step in the private equity model is the exit phase when the private equity fund sells the company either through a new listing, sale to another company (trade sales) or through sales to another private equity firm (secondary sales). An initial public offering (IPO) is usually the most profitable and desirable route for a fund but trade sales have been the most common form of exit except in recession periods, accounting for a third of all exits in some jurisdictions. It is important to note that in an IPO, the private equity fund often maintains a sizeable equity position for some time thereafter, and presumably remains an active monitor.

Partial sale of the portfolio company provides a means for realising part of the initial investment without losing control and might indicate an evolution of the private equity model. The number of partial sales following

buyouts is generally between 70 and 100 per year in the UK and around half this level across Continental Europe. The total value of partial sales peaked at around Euro 9 billion in 2005, with Euro 2.2 billion worth of disposals in Continental Europe.

The performance of companies re-listed after a public-to private transaction is good and in many cases superior to other companies

It is sometimes argued that firms exiting private equity are weakened by high debt. While there are some high profile examples of quick collapses (e.g. Refco), this image is not supported by the data. The review of empirical work conducted for the Group pointed to one important study of 496 private equity-led IPOs in the US during the period 1980-2002 that found that these companies, and especially the larger ones, significantly outperformed the market and other IPOs. The exception to this result concerns “quick flips”, such as when a company is returned to the market within one year. Such “quick flips” receive a great deal of press attention but are not common.

...but some methods have raised concerns

Some concerns have been raised about the sharp rise in refinancing and leveraged recapitalisations in recent years. Leveraged recapitalisation usually involves returning to the debt market in order to release capital from the enterprise to investors (e.g. by a special dividend). At this stage it is difficult to see whether this is a temporary phenomenon or a sign of a change in the business model.

Company performance appears to improve under private equity...

The review of research about company performance commissioned by the Steering Group noted that empirical evidence is at present mainly confined to the UK where there is a reasonable sample of exited transactions. This allows for the measurement of the increase in the value of the enterprise as distinct from the return to equity which is biased upwards by leverage and dividend distributions. One study of exited buyouts in the UK found an average return of 22% net of market index returns on the enterprise value of the firm, indicating that real gains are achieved. The most common form of value creation by private equity investment is through add-on acquisitions (53%) and replacements within the top management team (43%). In around a fifth of the cases, value-creating activities involved expansion of the product line, growth in sales, a new marketing approach, strategic reorientation, organisational restructuring, geographical expansion, cost cutting and adjustments in work force/consolidation and outsourcing.

....but the risk adjusted returns to investors do not suggest unlimited potential for private equity so that it might be seen as a complement to public markets

An important question is whether the private equity model is sustainable and represents an alternative to public markets. While it appears to be highly profitable for private equity partnerships (one has to also bear in mind the significant losses from failed investments), does it offer returns to investors net of fees that would encourage them to maintain their investment? The evidence considered by the Steering Group is mixed. A recent study of 199 US buyout fund investments finds a positive and statistically significant alpha (*i.e.* excess returns to the market return) in comparison with equally risky levered investments in the S&P 500. Other studies are more agnostic, indicating average returns net of fees to be roughly equal to holding the S&P 500 but there is a wide and persistent difference between private equity funds. This might indicate that the room for such funds is limited so that it is a far from universal model.

The empirical work reviewed for the Steering Group indicates that private equity is a risky business with a number of transactions involving companies already in difficulties yielding low returns, offset by some highly profitable investments. As an illustration, one study showed a mean rate of return to equity of 70.5% but a median of -17.8%.

The aggregate effect on employment is not inherently negative and should be further assessed...

The Steering Group noted that employment effects were often a public concern when discussing ownership by private equity firms and intervention by “activist” hedge funds. However, it is not possible at this time to draw any substantiated conclusions about their aggregate effect on the overall level of employment, which is the relevant aspect from a public policy perspective. The aggregate employment effect will depend on how long companies have been held by private equity funds and the age composition of the portfolio of public-to-private companies. It will also depend on the state of the business cycle, labour market flexibility and adjustment policies. It would not be economically meaningful to record the employment of a public-to-private company sold to another company (*i.e.* trade sale) as an employment loss associated with private equity. When viewed over the whole life of the public-to-private investment, it does not appear that active ownership strategies have an inherently negative impact for

employment by a company. Considering this topic's importance, the Steering Group will nevertheless continue to follow empirical and analytical work related to the link between active ownership strategies and the aggregate impact on employment.

*...together with
stakeholder issues
more generally*

In line with Chapter IV of the OECD Principles, the Steering Group recognised that various stakeholders often have a strong interest in the outcome of a public-to-private transaction. In some jurisdictions, these rights might be less defined and enforceable than in others. One aspect that has been observed in a number of cases concerns creditors in the target company suffering a market loss when their debt is downgraded due to a leveraged buyout. Such an event can also happen in a conventional merger or acquisition when the purchaser is highly leveraged. A solution adopted by some creditors is to insist on change of control covenants in their loan agreements, but these may not be enforceable in some jurisdictions.

*Employee rights
established by mutual
agreements might also
be an issue*

The Steering Group also noted that in some jurisdictions, employee rights established by mutual agreements might also be an issue in a public-to-private transaction. The acquired rights include agreed health and pension provisions as well as performance-enhancing mechanisms. The issues are often complex, especially in those cases where a company is in financial difficulty and is being acquired by private equity to be restructured. The question facing employees might be either to renegotiate the pension or health agreement or force the company into bankruptcy in the hope that claims will be protected. Much evidently depends on the specifics of the jurisdiction including the insolvency regime. In some jurisdictions, performance-enhancing mechanisms are enshrined in labour or corporate law and therefore, like other rights established by law, do not change even in the event of a change in ownership.

Part III

Ageing, Pensions and Household Leverage

Longevity Risk and Private Pensions

Pablo Antolin

This paper examines how uncertainty regarding future mortality and life expectancy outcomes, i.e. longevity risk, affects employer-provided defined benefit (DB) private pension plans liabilities. For this purpose, it examines the different approaches that private pension plans follow in practice when incorporating longevity risk in their actuarial calculations. Unfortunately, most pension funds do not fully account for future improvements in mortality and life expectancy. The paper then presents estimations of the range of increase in the net present value of annuity payments for a theoretical DB pension fund. Finally, the paper discusses several policy issues on how to deal with longevity risk emphasising the need for a common approach. In this regard, it argues, following Antolin (2007), that to assess uncertainty and associated risks adequately, a stochastic approach to model mortality and life expectancy is preferable because it permits to attach probabilities to different forecasts.

Longevity Risk and Private Pensions

Pablo Antolin^{*}

I. Introduction

Life expectancy has increased by 25 to 30 years during the last century

The length of time people are expected to live in most OECD countries has increased by 25 to 30 years during the last century. These gains in life expectancy are good news. However, policy makers, insurance companies and private pension managers worry about the impact that these gains may have on retirement finances. As long as gains in life expectancy are foreseeable and they are taken into account when planning retirement, they would have a negligible effect on retirement finances. Unfortunately, improvements in mortality and life expectancy are uncertain. In this regard, longevity risk is associated with the risk that future mortality and life expectancy outcomes are different than expected.

The uncertainty surrounding longevity risk affects individuals and pension providers

As a result of this uncertainty surrounding future developments in mortality and life expectancy, individuals run the risk of outliving their resources and being forced to reduce their standard of living at old ages. Pension funds and life annuity providers (e.g. insurance companies), on

^{*} This paper is an abridged version of Antolin (2007). The author is Principal Economist in the Private Pensions Unit of the Financial Affairs Division in the OECD Directorate for Financial and Enterprise Affairs. He would like to thank André Laboul, Fiona Stewart, Gert Wehinger and Juan Yermo for comments on earlier drafts. He also thanks Delegates to the Working Party on Private Pensions of the OECD Insurance and Private Pensions Committee for useful discussions. The views expressed herein are those of the author and do not necessarily reflect those of the OECD or the governments of its Member countries. The author is sole responsible of any errors.

the other hand, run the risk that the net present value of their annuity payments will turn out higher than expected, as they will have to pay out a periodic sum of income that will last for an uncertain life span. In this context, individuals bear the full extent of the longevity risk when this risk is ‘uncovered’. However, private pension funds and national governments providing defined retirement benefits, as well as financial institutions providing lifetime annuity payments face this longevity risk.

Impact of longevity risk on DB private pension liabilities

The main purpose of this paper is to disentangle how uncertainty regarding future mortality and life expectancy outcomes would affect employer-provided defined benefit (DB) private pension plans liabilities. In this regard, the paper first focuses on assessing the uncertainty surrounding future developments in mortality and life expectancy, *i.e.* longevity risk.¹ Secondly, it examines the impact that longevity risk could have on employer-provided DB pension plans.

Assessing the uncertainty surrounding future improvements in longevity

In order to assess the uncertainty surrounding future mortality and life expectancy outcomes, section II first examines the link between mortality and life expectancy, explaining how life tables are constructed from mortality data. Secondly, it provides an overview of the developments in mortality and life expectancy over the past century. The improvements seen in mortality and life expectancy were unanticipated – as the consistent underestimation of actual outcomes illustrates.

Evaluating the impact on annuity payments

The second part of the paper focuses on the impact that longevity risk may have on employer-provided DB pension plans. Longevity risk affects the net liabilities of DB pension plans through their lifetime annuity payments as unexpected improvements in mortality and life expectancy increase the length of the payment period. Section III first examines the different approaches that private pension plans follow in practice when incorporating future improvements in mortality and life expectancy in their actuarial calculations. While some pension funds account for future improvements in mortality and life expectancy, but only partially, others use only the latest available life tables when evaluating their liabilities. Secondly, section III assesses the importance of the impact of longevity risk

on the liabilities of private pension plans. For this task, the paper presents estimations of the range of increase in the net present value of annuity payments for a theoretical DB pension fund. The results suggest that the younger the membership structure of a pension fund, the more exposed to longevity risk is the pension fund. However, older pension funds have less room for manoeuvre to deal with the costs associated with the materialisation of longevity risk.

Policy issues in managing longevity risk

Finally, section IV discusses several policy issues with regard to managing longevity risk, with a particular emphasis on indexing pension benefits to life expectancy. The first task would be to agree on a common stochastic methodology to assess future mortality and longevity outcomes. Governmental agencies are the best placed institutions to produce those forecasts. However, as the membership structure differs among pension funds, making assumptions regarding the overall population renders those forecasts less useful for particular pension funds. In this regard, pension funds are inclined to use different mortality tables according to the socio-economic status of their members. However, this remains controversial. Finally, changes in the regulatory framework requiring pension plans to fully account for future improvements in mortality and life expectancy may be required.

II. The uncertainty surrounding mortality and life expectancy

The link between mortality and life expectancy: life tables

Life tables provide a summary description of mortality and life expectancy

Life tables provide a summary description of mortality, survivorship and life expectancy for a specified population. They can contain data for every single year of age (complete life tables) or by 5- or 10-year intervals (abridged life tables). In its simplest form, a life table can be generated from a set of age-specific death rates (ASDR). ASDR are calculated as the ratio of the number of deaths during a year (from vital statistics) to the corresponding population size (from censuses and annual population size estimates). They are commonly expressed as per 1 000

habitants. Mortality rates on the other hand are the probability that an individual of a given exact age will die during the period in question (*i.e.* the probability of dying). In the case of annual probabilities, the denominator is the size of the generation who reach age n during the year in question, and the numerator is the number of individuals from this generation who die between age n and age $n+1$.² The annual probability of dying by age differs from the annual death rate because the latter is the proportion of people of that age who die during the year, while the probability of dying is the proportion of people at that age dying during the age interval.³

Life tables provide a link between mortality and life expectancy

Therefore, life tables provide a link between mortality and life expectancy. The final outcome of a life table is the mean number of years still to be lived by a person who has reached a specific exact age (*i.e.* the age-specific life expectancies), if subjected throughout the rest of his or her life to the current age-specific probabilities of dying. Table 1 is an example of a life table for male individuals in France in 2003. It is constructed from age-specific death rates (expressed in death rates per thousand). The first column reports different ages x . The second column, m_x , shows, for the observed period, age-specific death rates per capita (expressed in ASDR per thousand). The next column contains the age-specific probabilities of dying, q_x , computed as $(2 \cdot m \cdot n) / (2 + m \cdot n)$, where n is the width of the age interval. In the case of the open-ended age interval 110+ the probability of dying is one. Column four shows the mean number of person-years lived in the interval by those dying in the interval, a_x .⁴ People are assumed to die in the middle of the age-interval, however, at birth people are assumed to die at the beginning of the interval, while at ages 110+ people are assumed to die late in the interval.

The next columns compute the number of survivors at each age x of a hypothetical cohort of 100 000 individuals, l_x ; the number of deaths in the cohort between two consecutive ages, d_x ; the number of person-years lived by the cohort, L_x , and the total person-years remaining at each age, T_x .⁵ Life expectancies at age x , e_x , are computed by dividing T_x by l_x .

Associating age-specific life expectancy to each age-specific mortality rate

Therefore, given age-specific mortality rates, a life table provides the associated age-specific life expectancies (Table 1). Having a link between mortality and life expectancy, the next sub-section focuses on reviewing developments in both variables over the last hundred years in several OECD countries.

Table 1. Life table, France 2003

Age	m_x	q_x	a_x	l_x	d_x	L_x	T_x	e_x
0	0.004	0.00394	0.06	100 000	394	99 630	7 957 453	79.57
1	0.000	0.00038	0.50	99 606	38	99 587	7 857 823	78.89
20	0.001	0.00066	0.50	99 187	66	99 154	5 968 537	60.17
30	0.001	0.00080	0.50	98 530	78	98 491	4 979 901	50.54
40	0.002	0.00170	0.50	97 441	165	97 358	3 999 349	41.04
50	0.004	0.00440	0.50	94 781	417	94 573	3 036 208	32.03
60	0.008	0.00794	0.50	89 416	710	89 062	2 112 789	23.63
70	0.017	0.01673	0.50	80 010	1 339	79 341	1 260 628	15.76
80	0.048	0.04669	0.50	60 702	2 834	59 285	545 424	8.99
90	0.170	0.15647	0.50	24 949	3 904	22 997	106 062	4.25
100	0.447	0.36562	0.50	1 520	556	1 242	3 069	2.02
109	0.751	0.54616	0.50	6	3	5	8	1.31
110+	0.778	1.00000	1.29	3	3	4	4	1.29

Notes: Selected ages from table period 1x1 (age by year).

m_x is the per-capita annual death rate at age x .

q_x is the probability of dying at age x .

a_x is the mean number of person-years lived in the interval by those dying in the interval. It indicates when in the interval people die on average (e.g. beginning, middle, end).

l_x is the number of survivors at age x of a hypothetical cohort of 100 000 individuals.

d_x is the number of deaths in the cohort between two consecutive ages.

L_x is the number of person-years lived at age x .

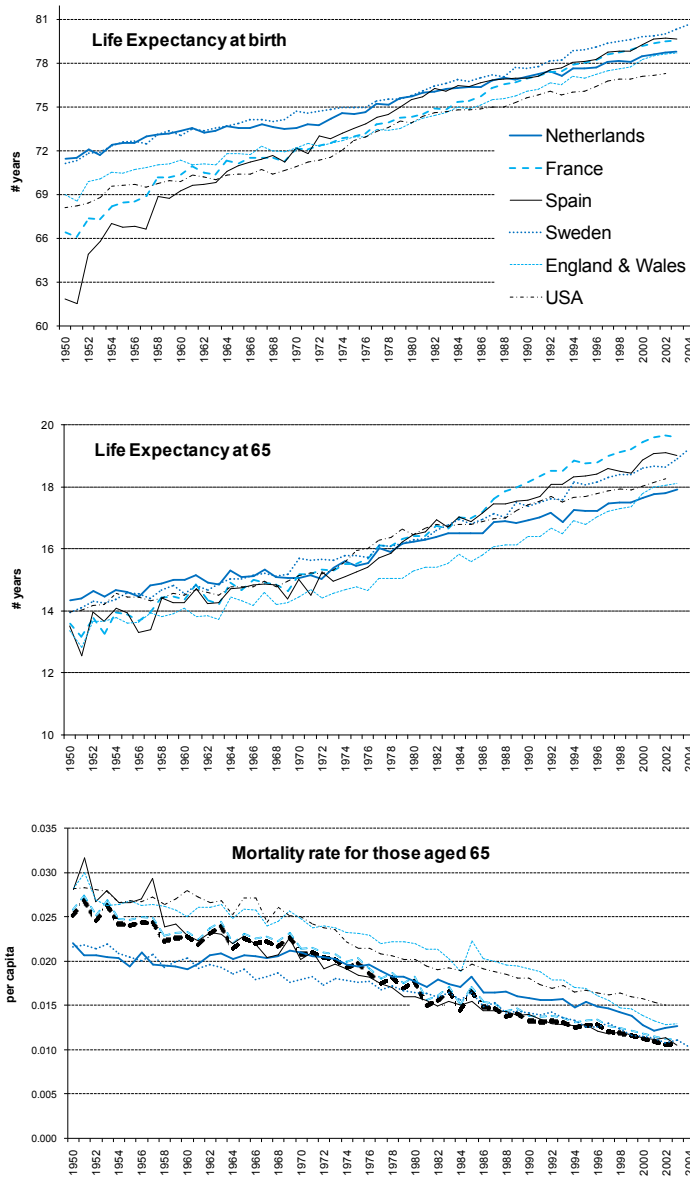
T_x is the total person-years remaining at each age x .

e_x is life expectancy at age x .

Source: Human Mortality Database (<http://www.mortality.org/index.html>).

Figure 1. Life Expectancy and mortality rates in selected OECD countries

1950-2003



Source: OECD.

The uncertainty surrounding mortality outcomes

Mortality rates have declined steadily over the past century, bringing about large increases in life expectancy

Mortality rates have declined steadily over the past century, which have translated into large increases in life expectancy at both birth and age 65 (Figure 1 and Table 2). These declines stem from substantial reductions in mortality rates at younger ages and, to some extent, improvements at old ages. During the first part of the 20th century, the decline in mortality was mainly due to a reduction of infectious diseases affecting mainly young ages. During the last decades of the 20th century, the decline in mortality was due to reductions in deaths due to chronic diseases affecting primarily older ages.⁶ This is confirmed when looking at the increases in life expectancy at birth and at age 65 during the 20th century (Table 2). Life expectancy at birth increased faster during the first half of the 20th century while life expectancy at age 65 increased faster during the second half, as confirmed by comparing the top and bottom panels in Table 2. Employer-provided DB pension plans are mostly affected by changes in mortality and life expectancy at older ages. In this regard, it is important to highlight that for most OECD countries, more than half of the improvement in life expectancy since the 1960s is due to increases in life expectancy at age 65.

Past projections have consistently underestimated these improvements

Past projections have consistently underestimated actual improvements in mortality rates and life expectancy. Improvements in mortality rates and life expectancy have increased the number of years that people spend in retirement, causing financial difficulties for DB pension funds, individuals and social security systems. During the past decades governmental agencies, actuaries and academics have tried to project and forecast mortality rates and life expectancy to assess future liabilities. However, past projections have consistently underestimated improvements (Antolin, 2007: Table 3).

Future increases in life expectancy from declines in mortality rates at old ages

Future increases in life expectancy will have to come mainly from further declines in mortality rates at old ages. There is a certain degree of uncertainty about the extent of future improvements in mortality rates and life expectancy. Nevertheless, as mortality rates at young and middle ages

have reached very low levels, improvements would have to come from declines in mortality at old ages, that is, from increases in life expectancy at age 65 or more, and, in particular, at very old ages (85+). However, there are different views as regards the outlook for human longevity (Siegel, 2005).

Table 2. Life Expectancy, 1900-2000
Increase in number of years per decade

	at birth	at 65
<i>20th Century</i>		
Canada (1921-2002)	2.8	0.7
France (1900-2003)	3.3	0.9
The Netherlands (1900-2003)	2.9	0.6
Italy (1900-2002)	3.8	0.9
Spain (1908-2003)	3.9	0.9
Sweden (1900-2004)	2.7	0.6
United Kingdom (1900-2003)	3.1	0.7
United States (1933-2002)	2.3	0.8
<i>1960-2000</i>		
<i>EU15 Average^a</i>	2.0	
<i>OECD Average^a</i>	2.2	
Canada	1.9	1.0
France	2.2	1.3
The Netherlands	1.3	0.7
Germany	2.0	
Italy	2.6	1.2
Spain	2.5	1.1
Sweden	1.7	1.0
United Kingdom	1.7	0.9
United States	1.8	0.9

a. Unweighted average.

Source: Human Mortality Database, and OECD Health Data 2005.

There is a great debate on the extent of those increases

There is a great debate on the extent of those increases in longevity. Essentially, there are two groups, those who argue that there are no limits to life expectancy (e.g. Oeppen and Vaupel, 2002) and those who are more conservative (e.g. Olshansky *et al.*, 2005). The first group concludes from historical trends and age trajectories that no limits can be set to life expectancy. They argue that mortality is likely to level off after some (unspecified) threshold, and, as a result, longevity would be uncapped and would keep increasing in the next decades. However, this view remains controversial. The more conservative group argues that the epidemiological transition,⁷ as well as the massive reductions in mortality rates required to produce even small increases in life expectancy, suggest that increases in life expectancy will slow down if not stop (Olshansky *et al.*, 2005). They believe that human lives might have natural limits. Furthermore, the empirical evidence showing that survival probability curves have become increasingly rectangular or compressed (Kannisto, 2000) suggests that there are limits to life expectancy. Unfortunately, the compression of mortality or “rectangularisation” theory is not conclusive (Siegel, 2005).

III. The impact of longevity risk on DB private pension plans

The impact of longevity risk on employer-provided DB pension plans...

This section examines the impact of longevity risk on employer-provided DB private pension plans. Antolin (2007) shows that using a stochastic approach to forecast mortality and life expectancy permits to attach probabilities to a range of different forecasts and thus assess the uncertainty surrounding future mortality and life expectancy outcomes. However, private pension funds are concerned with the effect of this uncertainty on their pension liabilities. As the main impact of this longevity risk on net pension liabilities is through their guaranteed annuity payments, this section evaluates the changes in the net present value of annuity payments as mortality and life expectancy evolves. These changes are evaluated for pension fund members at different ages, and for pension funds with different age-membership structures.

How does longevity risk affect DB private pension plans?

...is mainly on their liabilities through their annuity payments

The main impact of longevity risk on the net pension liabilities of employer-provided DB private pension plans is through their annuity payments. An annuity is an agreement for one person or organisation to pay another (the annuitant) a stream or series of payments (annuity payments). Annuities are intended to provide the annuitant with a steady stream of income over a number of years, which can start immediately or in the future. The capital and investment proceeds are generally tax-deferred. There are many categories of annuities. They can be classified in several ways, for example: (1) according to the underlying investment, into fixed or variable; (2) according to the primary purpose, *i.e.* accumulation or pay-out, into deferred or immediate; (3) according to the nature of pay-out commitment, into fixed period, fixed amount or lifetime; and (4) according to the premium payment arrangement, into single or flexible premium. In a fixed annuity, the insurance company or pension fund guarantees the principal and a minimum rate of interests, while in a variable annuity the annuity payment depends on the investment performance of the underlying portfolio. An immediate annuity is designed to pay an income one-time or an income stream immediately after the immediate annuity is bought, while in a deferred annuity, the annuitant receives the payment(s) at a later time. Fixed period annuities pay an income for a specified period of time (*e.g.* 10 years), while lifetime annuities provide income for the remaining life of the annuitant. A single premium annuity is an annuity funded by a single payment, while a flexible premium is an annuity intended to be funded by a series of payments. Flexible annuities are only deferred.

Annuities are fixed, deferred, lifetime and flexible premium

As employer-provided DB private pensions guarantee a fixed future stream of payments at retirement to their members for the rest of their life, the analysis throughout focuses on the impact of longevity risk on fixed, deferred, lifetime and flexible premium annuities. Longevity risk would have a large effect on annuities that are fixed, deferred and for the lifetime of the annuitant once

retirement age is reached. The impact of longevity risk on fixed period annuities, on the other hand, is less clear-cut. Moreover, the magnitude of the impact of longevity risk on annuity payments would depend not only on the type of annuity guarantees but on how pension funds account for improvements in mortality and life expectancy when calculating the net present value of annuity payments.

How do private pension funds account for future improvements in mortality and/or life expectancy?

Pension funds do not seem to fully account for future improvements in mortality

Unfortunately, pension funds do not seem to fully account for future improvements in mortality and life expectancy. Recent studies, in particular, the research by the Actuarial Profession and Cass Business School (2005), found that current practice varies considerably across the European Union. Pension funds in some countries incorporate an allowance for expected future improvements in mortality, while others use tables that relate to mortality observed over a period in the past, without allowing for the fact that life expectancy may continue to increase (Belgium, Denmark, Norway, Sweden, and Switzerland). Of those countries incorporating an allowance for future improvements in mortality, Austria, France, Germany (for only 25 years and using 1996 as the base year), Ireland (improvements incorporated only until 2010), Italy, the Netherlands, Spain, and the United Kingdom use forecasts; while Canada, Finland, and the United States, despite of having mortality tables with built-in mechanisms to take into account future changes in mortality, generally do not use them.

Furthermore, there is not a standard methodology to incorporate them

Furthermore, there is no consistent or standard methodology to incorporate future improvements in mortality and life expectancy. In this regard, there is a big problem with tracking longevity risk because the lack of a standard methodology makes mortality calculations arbitrary and difficult to compare across pension funds and, let alone, countries.⁸

Moreover, pension funds are restricted with regard to demographic assumptions

Moreover, in most countries pension funds are restricted with regard to the demographic assumptions they can incorporate in their assessments. The study by the *Groupe Consultatif Actuariel Européen* on actuarial methods and assumptions used in the valuation of retirement benefits in the EU and other European countries, suggests that only in a few countries (Ireland, Italy, the Netherlands, Portugal and the UK) demographic assumptions are chosen by the actuary without any direct restrictions from the supervisory or taxation authorities.⁹ Rigid regulation regarding demographic assumptions can be inadequate when prohibiting pension funds from using alternative mortality tables that incorporate improvements in mortality and life expectancy and may result in a better assessment of longevity risk.

As a result, the impact of longevity risk is compounded

Therefore, the impact of the uncertainty surrounding future improvements in mortality and life expectancy (*i.e.* longevity risk) on employer-provided DB private pension plans is compounded. Few actuaries and pension schemes account for future improvements in mortality and life expectancy, and those that account for improvements generally do it only partially. In addition, the base tables used for demographic assumptions, even if adjustments for future improvements in mortality are included, are almost ten years old, from the early to mid-1990s. Furthermore, the lack of standard methods to forecast mortality and life expectancy, and the fact that these methods are generally far from being fully stochastic complicate any comparative analysis and make the task of examining the impact of longevity risk on pension fund liabilities more difficult.

The impact of longevity risk on net pension liabilities

The impact on the net present value of annuity payments of DB plans...

This sub-section focuses on the impact of unexpected improvements in mortality and life expectancy on the net present value of annuity payments of an employer-provided DB fund.¹⁰ Firstly, it presents the results of calculating the increase in the net present value in 2005 of annuity payments due to a pension fund member at different ages. The pension benefit is a fixed amount of EUR 10 000 at 2005 values and it is paid over the lifetime of a member

after reaching retirement age at 65. Secondly, this subsection discusses the results of calculating the increase in the net present value in 2005 of annuity payments of a hypothetical DB pension fund given different age-membership structures. For simplicity, the pension fund is assumed to be closed to new members.¹¹

Table 3. The increase in the net present value of annuity payments^a

Age in 2005					Percentage increase		
					Hypothetical pension fund		
25	40	55	65	70	(1)	(2)	(3)
23.6	15.3	7.3	3.3	2.4	10.4	9.6	8.2

Notes:

a. Increase resulting from comparing the net present value (NPV) in 2005 of annuity payments from 2005 until 2090 when life expectancy at birth improves by 1.2 years per decade and life expectancy at 65 by 0.8 years per decade, with the 2005 NPV of annuity payments when the latest available mortality tables (2005) are used without allowing for improvements in mortality.

(1) Membership structure in 2005: 65% aged 25-49; 20% aged 50-59; 10% aged 60-69; and 5% aged 70 or more.

(2) Membership structure in 2005: 60% aged 25-49; 20% aged 50-59; 15% aged 60-69; and 5% aged 70 or more.

(3) Membership structure in 2005: 50% aged 25-49; 20% aged 50-59; 20% aged 60-69; and 10% aged 70 or more.

Source: OECD calculations.

...is inversely related to the age of pension fund members

Results show that the gap in the net present value of annuity payments between taking into account mortality and life expectancy improvements or not, is inversely related to the age of pension fund members. Table 3 reports the increase in the net present value of annuity payments for several ages. This increase is the result of comparing the net present value of annuity payments when using the latest available mortality tables and when using mortality tables that account for improvements in mortality and life expectancy. In this particular case, the calculations reported assume that life expectancy at birth and at age 65 increases by 1.2 and 0.8 years per decade, respectively. As a result of taking into account these improvements in mortality and life expectancy, benefit payments to a 25 year old member in 2005 increase by almost a quarter with respect to the case when no account for improvements is taken. This increase drops to 3.3% for a 65 year old member. This

Therefore, pension funds with an older age-membership structure will experience a smaller impact

inverse relationship stems from the fact that the exposure of the pension fund to improvements in life expectancy is larger the younger the individual is today.

Therefore, pension funds with an older age-membership structure will experience a smaller impact from longevity risk on their liabilities. However, they may have less room for manoeuvre to correct for changes in longevity risk. The age composition of the pension fund members is quite important to determine the overall impact of unexpected improvements in mortality and life expectancy. The right hand side panel of Table 3 shows the increase in the net present value of annuity payments for a “theoretical pension fund” according to its membership structure. This increase is smaller as the membership ages. Table 3 indicates that an unexpected improvement in life expectancy at birth of one year per decade could increase pension fund liabilities by as much as 10%.¹² Taking into account that funding regulations of pension funds suggest that a deviation in liability calculations of more than 5% is above the acceptable margins of risk, the impact of longevity risk needs to be accounted for.¹³ Furthermore, following the results in Antolin (2007), there is a 10% to 30% chance that the net present value of annuity payments increases by as much as 10%.¹⁴

IV. Policy issues

Longevity risk has a non-negligible impact on the liabilities of DB pension plans and should be accounted for

The paper has shown that longevity risk, defined as the uncertainty surrounding future developments in mortality and life expectancy, has a non-negligible impact on the liabilities of employer-provided DB pension plans through their lifetime annuity payments. Even so, few pension plans account for longevity risk, and if they do, account for it only partially or use outdated mortality tables. More generally, there is a lack of a common methodology to account for longevity risk.

There is a clear advantage of using common methodology

Thus there is a clear advantage from using a common methodology to forecast mortality rates and life expectancy. In this regard, Antolin (2007) argues for using a stochastic model as it permits to attach probabilities and thus assess the degree of uncertainty surrounding future

mortality and life expectancy outcomes.¹⁵ Unfortunately, many small and medium size pension funds may not have the financial resources or the technical capability to produce forecasts using a common methodology. Insofar as governmental agencies (e.g. national statistical institutes) have the resources and technical capabilities, they could produce them. However, assumptions regarding the overall populations rather than the specific membership populations of private pension plans may not be of much use to them. Governmental agencies could produce forecasts for the entire population and for different subgroups according to gender, age, income and educational level. Hence, different pension funds could use the corresponding sub-population that matches its current membership structure more closely.

Using mortality tables differentiating by socio-economic status and gender is problematic

However, using mortality tables differentiating according to socio-economic status and gender has its own problems as it could give rise to problems of discrimination. Arguments in favour of differentiating tables include that using an average life expectancy index penalises people with higher life expectancy (e.g. women, more highly educated and high income people), favouring people with lower life expectancy (e.g. men, low educated and low income people). Moreover, private pension plans need to hedge against their own longevity risk, *i.e.* the risk attached to their own membership structure, instead of an average longevity risk.

Need to change regulatory framework

There may be a need for a change in the regulatory framework requiring pension funds to fully account for future improvements in mortality and life expectancy as well as guiding pension funds regarding the type of approaches best suited to forecast those improvements and assess their associated uncertainty.

Indexing pension benefits to life expectancy can alleviate the impact of longevity risk

Finally, in addition to incorporating improvements in mortality with the help of a common methodology and the use of average or differentiated mortality tables, the impact of longevity risk on employer-provided DB plans can be partly offset by indexing pension benefits to life expectancy.¹⁶ However, indexing benefits to life expectancy shifts part of the longevity risk back to individuals, removing one of the main incentives individuals have to acquire annuities. In this regard,

differentiating between individual and aggregate or cohort longevity risk can be of help. Individual risk of longevity can be pooled, and pension funds are best placed to pool such risks. The aggregate or cohort longevity risk, on the other hand, is more difficult to address or hedge against. Therefore, this risk is better to be shared between pension funds and individuals by indexing benefits to cohort longevity changes.¹⁷

Notes

1. Throughout this paper, point forecasts on mortality and life expectancy are not discussed because the aim of the paper is to provide ways of exploring and assessing uncertainty instead of providing another set of projections.
2. Some deaths occur during the year in question, while other deaths occur the following year.
3. For example, a person reaching age 65 in 2000 who dies at age 65 but in 2001 will be counted when calculating the probability of dying at 65 in 2000, but it will not be counted when calculating the death rate at age 65 in 2000.
4. This is a key variable. When using 1-year age groups it is assumed that people die in the middle of the age-interval, when using 5-year age intervals one can assume also the middle of the interval or, if data is available, use the single year age data to build the mean.
5. The number of deaths, d_x , is computed by multiplying the number of survivors of the cohort by the probability of dying. The number of survivors, l_x , at age $x+1$ is the difference between those surviving at x minus those dying at x . For computing the number of person-years lived, L_x , one has to make certain assumptions as the time of actual deaths within an age interval is not known; generally it is assumed that people died in the middle of the interval. While this is a good approximation when using 1-year intervals, this mid-interval assumption may not be

fully accurate when using 5-years intervals. The formula is $(n \cdot (1 - (d \cdot a)))$. Finally, T_x is obtained by accumulating the L column backwards.

6. This reduction was mainly due to reduced illnesses from cardio-vascular diseases.
7. Gains in longevity during the last century occurred mainly at young ages and were based on successes dealing with infectious and parasitic diseases. These are externally caused and relatively easy to treat with vaccines and immunisation. However, future gains should focus on old ages where there is a predominance of degenerative diseases of later life, such as cancer, cardiovascular diseases and diabetes. These are chronic and progressive, and more difficult to treat.
8. The Actuarial Profession and Cass Business School (2005) report the large variety of approaches used by those pension funds adjusting partially their liability calculations for mortality and life expectancy improvements.
9. In addition, the study by the *Groupe Consultatif Actuariel Européen* notes that only in Ireland, Cyprus, France, Italy and the United Kingdom an allowance for improvements in mortality is part of the demographic assumptions.
10. In this sub-section, the paper does not provide a whole range of possible outcomes. The next step in the current project is to provide this range using Monte Carlo simulations and thus be able to assess uncertainty. In this case, random number generators can also be incorporated in interest rates, discount rates and wage assumptions, allowing therefore assessing the whole range of risks affecting annuity payments.
11. Additionally, wages are assumed to grow at 3.5% nominally in line with productivity growth of 1.75% and inflation of 1.75%. The discount rate is set at 3.5% offsetting therefore any impact due to differences between discounting and the growth of payments. Hence, the changes in annuity payments are only due to changes in life expectancy.
12. It is important to recall here that the difference between the projections of life expectancy for 2050 prepared by national statistical institutes and the simple extrapolation of past trends is one year per decade.
13. A recent study by the Actuarial Profession and Cass Business School (2005) compares mortality assumptions used in corporate pension liability calculations across EU countries, Canada and the United States. Considering a pension scheme with an actuarial deficit of GBP 200 million (e.g. with assets of GBP 800 million and liabilities of GBP 1000 million), calculated using UK's mortality assumptions, they find an

increase in the net liabilities of GBP 63 million when using French mortality assumptions, but a reduction in net liabilities of GBP 131 million (*i.e.* net liabilities of GBP 69 million) when using Dutch mortality assumptions.

14. Antolin (2007) shows that there is a 10% to 30% uncertainty surrounding the likelihood that life expectancy at 65 in 2050 would be one year higher than the central forecasts.
15. CMI (2005a, 2006) and Lee (1998) also argue for using a stochastic approach to forecast mortality and life expectancy.
16. Yet, indexing also brings up the previous discussion related to using average or differentiated mortality tables.
17. Antolin and Blommestein (2007) deal with this issue in the context of whether government should issue longevity bonds as hedging instrument against longevity risk. The Group of Ten (2005) provides further discussions on the issue of longevity bonds and government involvement.

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Asset Allocation Challenges for Pension Funds: Implications for Bond Markets

Carolyn Ervin and Sebastian Schich

Pension funds have become the largest class of investors in many markets and, given their size, the allocation of their assets has important implications for the relative prices of financial assets. There may be a trend shift of private (defined benefit) pension fund asset allocation strategies away from equity to bonds, especially to government bonds, given their limited credit risk. The potential demand for such bonds could, in principle, be very substantial, sufficient in fact to result in a scarcity of such bonds in circulation. Many debt managers have taken advantage of current bond market conditions and issued long-term to ultra-long-term bonds. But whether they should follow a strategy of maturity-lengthening with the express aim to facilitate the task for pension fund managers is a different matter. Most policy makers would not recommend that governments undertake to issue long-term debt with the express intent of meeting this demand, not least because they expect the price mechanism to clear apparent imbalances in asset markets.

Asset Allocation Challenges for Pension Funds: Implications for Bond Markets

Carolyn Ervin and Sebastian Schich*

I. Introduction

Pension fund asset allocations have important implications for the relative prices of financial assets

Ageing populations in OECD countries and the need for savings to fund retirement incomes have led to tremendous growth of assets held by pension funds. As a result, these institutions have become the largest class of investors in many markets and, given their size, the allocation of their assets has important implications for the relative prices of financial assets. Motivated by a sharper focus on risk management, many pension funds are changing their asset allocation strategies towards closer asset-liability matching. This change has been in train for some time, but it has recently been given added impetus by accounting and regulatory changes and the experience of funding gaps in corporate pension funds.

Some observers argue that a shift of pension fund assets away from equity to bonds is already happening...

There seems to be growing consensus that the sharper focus on asset-liability management typically involves a shift of pension fund assets away from equity to bonds, especially to government bonds, given their limited credit risk. Some observers argue that the shift is already

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...while others argue that there is still a large unrealised demand for high credit quality long term bonds

happening and that it has contributed to downward pressure on long-term interest rates. Indeed, the total value of assets held by private pension funds is large compared to the amount of such debt instruments outstanding. As a consequence, an attempt by the pension fund universe to shift a large share of its portfolio holdings to bonds could, other things equal, have possible effects on relative asset prices, as the potential demand could exceed the supply of such instruments by a large margin, especially in the long-term maturity segment. Other observers argue that the implied effect may not yet have materialised and that there is a large pent-up demand for long-term government bonds by pension funds.

The potential demand for long-duration bonds could be sufficient to result in a scarcity of such bonds

The potential demand for long-duration bonds could, in principle, be very substantial, sufficient in fact to result in a scarcity of such bonds in circulation. To the extent that such a scarcity emerges, the question arises what steps, if any, governments should take in response. Debt managers may, for example, want to shift the weight of their issuance toward the long-end of the maturity spectrum. Current conditions would allow them to lock in relatively low financing costs for long time horizons. Indeed, many debt managers have taken advantage of current bond market conditions and issued long-term to ultra-long-term bonds. But whether they should follow a strategy of maturity-lengthening *with the express aim* to facilitate the task for pension fund managers is a different matter.

Another issue is that the data currently available on developments in pension funds assets and liabilities are not complete and thus it is difficult to say with any certainty how large is the potential demand for government bonds by pension funds and to what extent part of that demand is already being met and, thus, is reflected in current bond prices. There is a need for increased transparency about developments in the pension sector to address this question as well as prudential and other important issues. As part of such efforts, the OECD launched in 2002 a project to establish a harmonised set of statistics and indicators related to pension funds, the *Global Pensions Statistics Project*.

II. Demographic developments, financial markets and private pension funds

Demographic developments and financial asset prices

The investment characteristics of financial instruments are important for retirement income financing

Demographic and financial market developments interact in various ways. The investment characteristics of financial instruments are important for the provision of retirement income for an ageing population in systems with advance funding. By the same token, changes in the age structure of the population affect the economy's saving behaviour above and beyond its influence on growth and public finances. Clearly, changes in the level of saving and the choice of saving vehicles, in turn, could have important implications for financial asset prices (see e.g. Schich, 2004).

Ageing of populations in OECD countries reflects at least three different aspects: a decline in fertility, an increase in longevity and the advance of the baby-boom generation in each country through its life cycle. The latter aspect, even though in a long-term perspective it can be interpreted as a temporary phenomenon, appears to have important implications for asset prices. For example, financial markets in general and equity markets in particular during the 1990s have benefited from large inflows into pension funds and other institutionalised forms of saving, which were invested in financial assets. These inflows reflected to a considerable extent saving for retirement by baby-boom generations. Looking ahead, while there are some differences across OECD countries regarding the entry of baby-boom generations into retirement, most OECD countries will experience a decline in the share of their middle-aged high-saving population and an increase in the share of the old-aged population. Nonetheless, at least for some time, private retirement-related savings are likely to continue increasing in most OECD countries (Group of Ten, 2005).

While these developments may be seen as broadly supportive of financial asset prices, the relative prices of these assets may change as a result of life-cycle considerations. Indeed, typical life cycle considerations

would suggest that baby boomers nearing or entering retirement switch within their remaining financial asset holdings from equity to less volatile instruments such as bonds. As long as households are themselves responsible for their investment decisions, life-time considerations may indeed influence the choice of assets into which these savings are invested. In practise, however, the empirical evidence regarding this link is rather mixed.

Importance of institutions in retirement saving accumulation

A large part of retirement savings are channeled through pension funds

A large part of retirement savings are channelled through institutions such as pension funds, life insurance companies, investment companies etc. These institutions' investment strategies may be guided by additional and/or different considerations than those of individuals, given that these entities pool resources and, in the case of defined benefit arrangements, risks as well. Among the different forms of institutionalized saving, the growth of pension funds is probably most directly related to saving for retirement income, although the growth of other types of institutional investors such as life insurance companies, *e.g.* especially in Germany, also link to a considerable degree to saving for retirement income (Davis, 2002).

Pension funds in the OECD have grown dramatically from about USD 6 trillion in the mid-1990s to almost USD 18 trillion by 2005...

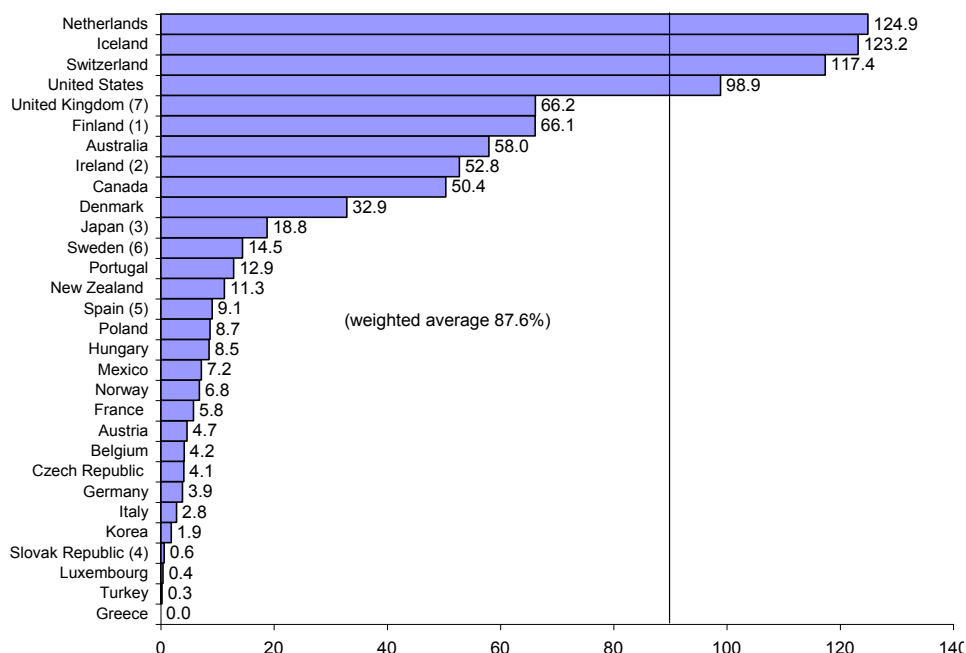
Pension funds in the OECD area have grown dramatically over the last decade, from about USD 6 trillion in the mid-1990s to almost USD 18 trillion by 2004, reflecting a growth of about ten per cent each year (OECD, 2006). The ratio of total OECD pension fund assets to GDP increased to almost 90 per cent in 2005. Pension fund sectors are also large compared to the sizes of financial markets. Aggregate pension fund assets represent more than 20% and 10% of worldwide equity and bond market capitalisations, respectively.

...equivalent to 10% of global bond market capitalisation

There is great variability across countries in these measures, however. Figure 1 shows the variation of the size of pension funds measured as a percentage of annual GDP. To a large extent, the size of pension funds is related to their maturity and whether or not they have been introduced as mandatory occupational schemes (Davis, 1995).

Figure 1: Importance of pension funds in selected economies

2005, in per cent of GDP



Source: OECD Global Pensions Statistics Project

For example, in the Netherlands, almost 90% of workers subscribe to pension funds, compared with 40 to 50% in the United Kingdom, United States and Canada, and less than 10% in most other countries (Boeri *et al.*, 2006). Also, private pension funds are important in those countries where state provision is relatively low and confined to providing a flat benefit; in countries where the public income replacement rate is relatively high, these entities are relatively less developed. In Europe, for instance, the United Kingdom and the Netherlands have the largest funded sectors, with the amount of money in pension funds being close to or above the annual GDP of those countries, while in France, Germany and Italy, pension funds play only a very limited role.

Looking ahead, projected demographic developments are expected to be reflected in further growth of pension fund assets. A recent report on ageing, pension systems and financial markets produced by a G10 working group concluded that “more resources are being channeled to capital markets to provide for retirement ... and that much of the additional retirement-related flows to capital markets will be intermediated by pension funds, which have already become the largest institutional investor class in the G10 economies.” (Group of Ten, 2005).¹

Corporate (defined benefit) pension funds

In defined benefit schemes, the sponsoring employer promises to hold sufficient funds to meet retirement benefit promises

Private pension plans generally can be placed into two broad categories, defined contributions (DC) and defined benefit (DB) plans, although there are many variants and some hybrid forms.² In defined contribution plans, benefits to plan members are based solely on the amount they contribute to the plan plus the investment return thereon. In defined benefit schemes, by contrast, sponsoring employers make two related promises to employees: First, there is a promise to plan members that they will receive retirement benefits at a certain level, typically based on a formula linked to members' salaries and length of employment. Second, the sponsoring employer promises to make contributions to a legally separate fund or to hold in reserve amounts sufficient to provide those benefits. Corporate defined benefit pension plans are a very important part of the private pension fund universe. According to estimates by the *OECD Global Pensions Statistics Project*, in some countries, including Belgium, Canada, Finland, Germany, Japan, the Netherlands, Norway, Portugal, Sweden, the United Kingdom, assets in corporate DB plans represent the majority, often the vast majority, of total private pension funds assets. An important feature of these institutions is that the fixed nature of benefits under such plans implies that plan sponsors face risks, such as financial and longevity risks.

III. Developments in funding of defined benefit corporate pension funds

As a result of falling equity prices and declining interest rates, many pension funds experienced considerable funding difficulties

Pension funding gaps

Financial market developments between 2000 and 2003 have highlighted the importance of the financial risks for sponsor companies associated with the guarantees provided through defined benefit pension schemes.³ Specifically, as a result of falling prices for equity (in which a considerable part of many pension funds were invested) and declining long-term interest rates (which are used to calculate the current value of pension liabilities), many pension funds experienced considerable funding difficulties.

Pension plans are normally subject to legally mandated prudential requirements for adequate funding. In many jurisdictions, in order to meet its obligations to provide pensions under defined benefit schemes, the sponsoring employer creates a pension fund, *i.e.*, a dedicated pool of assets funded by its contributions, those of the employee or both. These assets are then invested, including in financial market instruments in order to enable the fund to generate sufficient income to meet the specified pension obligations. If the estimated market value of the assets falls short of the value of estimated liabilities, a funding gap exists. It is notoriously difficult to form a judgement about the exact magnitude of such gaps because of an important element of discretion in calculating future liabilities and estimating asset returns of such plans. Nonetheless, estimates of funding gaps were considered to be of sufficiently large scale to raise serious concern among sponsor companies, financial market participants and policymakers.⁴

With the recovery in financial markets after the 2000-2003 downturn, there has been progress in reducing defined benefit pension fund deficits. Nonetheless, sizeable deficits persist in several corporate pension plans in OECD countries. For example, estimates for the United States and the United Kingdom suggest that funding gaps continue to be significant, as reflected in average defined benefit pension funds' cover ratios that continue to be below 90%

(Boeri *et al.*, 2006). One consultancy company estimates that pension deficits of the FTSE 100 companies totalled GBP 36 billion as July 2006. According to recent estimates from Aon Consulting, the accounting deficit of the 200 largest pension funds in the United Kingdom may have fallen to GBP 4 billion at the end of May 2007, which would represent an improvement of almost GBP 100 billion over the last few years. The Pension Benefit Guarantee Corporation of the United States estimated that as of the third quarter of 2006, the total shortfall in all insured corporate pension plans was approximately USD 350 billion.

Causes of funding gaps

In many OECD countries poor stock market performance from 2000 to 2003 contributed to a sharp decline in the value of pension fund assets...

...while pension fund liabilities rose as interest rates declined

There are several factors that help to explain the deterioration in pension funding levels. As mentioned above, the estimated funding gap or surplus is the difference between two estimates, those for assets and for liabilities. In most cases, the development of funding gaps was more complicated than a single-sided scenario focusing either on assets or on liabilities would indicate. In fact, rather than declines in asset values or increases in liabilities, for several countries, both outcomes occurred. In many OECD countries poor stock market performance from March 2000 to March 2003 contributed to a sharp decline in the value of assets held in many private pension funds. Pension liabilities increased as long-term interest rates declined, because the latter are used as discount rates to calculate the current value of liabilities from future payment promises. While increases in liabilities were an important factor explaining the worsening pension funding situation, it appears that the equity market downturn may have been a more important factor, especially in countries where pension funds were relatively heavily invested in that asset class.

More fundamentally, the deterioration in pension funding reflects a “mismatch” between the maturity structures of cash flows associated with assets and liabilities. There has been a long-standing debate among both academics and practitioners about the “ideal” asset choice for defined benefit pension funds’ investments. At the moment, there appears to be an increase in the

proponents of a strategy that relies very much on fixed-income investments. *A priori*, it would seem that there is no “natural” investment choice for pension fund assets: Neither bonds nor equity are perfect matches for liabilities that consist, in the case of a defined benefit pension fund liability, of the obligation to pay a regular income to future retirees and beneficiaries. On the one hand, some pension fund experts have argued that pension funds could be assumed to have investment horizons of at least a few decades and that over those periods, equities have in the past typically outperformed bonds. Moreover, equities may be more highly correlated with wages than bonds, providing a better match for defined benefit liabilities. Other pension fund experts argue that pension liabilities are more “bond-like” than “equity-like” and that investments in equities rather than bonds represent a greater mismatch for pension liabilities, as equity returns are more volatile than those associated with bonds. Thus, to minimise volatility in retirement planning, bonds would be the better choice.

Consequences of funding gaps

The existence of pension funding deficits has negative effects on sponsor companies’ conditions of external financing

The existence of funding deficits in defined benefit pension plans has negative repercussions for the affected sponsor companies, including on their conditions of external financing. For example, according to some estimates which attempt to control for other determinants of stock prices, the size of funding gaps had a noticeably negative effect on equity prices in the case of some companies in the automobile and airlines sectors in the United States. These companies typically have mature defined benefit schemes that are relatively large compared to the companies’ own market capitalisation. One might think that the performance of pension funds including their surplus/deficit situation may not influence the equity market valuation of sponsor companies because often pension plan assets and liabilities are off-balance sheet and these plans may be viewed as segregated from the rest of the firm, especially as pension plans have their own trustees and as there are specific complicated pension accounting rules. As a matter of fact, there is a substantial body of literature which suggest that such a link exists. This body of literature provides considerable empirical

evidence that the equity market valuations of firms take into account the difference between the value of pension plan assets and its liabilities and perhaps even the volatility of such positions. Clearly, as current accounting changes tend to make the situation of pension plans more transparent, this link may become even stronger.

The obligation to fill these gaps also represents a serious drain on resources available for investment

Further to such effects on external financing costs, the obligation to fill these funding gaps can represent a serious drain on resources in some companies that would otherwise be available for other purposes, including for investment. For example, according to estimates from the OECD *Global Pensions Statistics Project*, employers' contributions to their pension funds exhibited an upward trend in several OECD countries over the period from 2001 to 2004, with such contributions showing pronounced increases *e.g.* in Canada and the Netherlands. In the United Kingdom, a private consultancy company estimated that annual company pension contributions have increased to record levels in 2005, with two FTSE 100 companies having made payments in excess of GBP 1 billion each to their respective pension funds. Clearly, the advent of defined benefit pension funding gaps and the pressures to fill them has motivated pension fund managers to focus more closely on risk management, with implications for their asset allocation strategies.

The decline in the number of defined benefit schemes may have been reinforced by experiences with funding gaps

There also has been a decline in the actual number of defined benefit schemes, and this decline may have been reinforced by experiences with funding gaps. In a few countries, such as Australia, Sweden, the United Kingdom, and the United States, a shift in employer-sponsored pension plans from DB to defined contribution (DC) schemes has been underway for some time. This shift reflects a variety of factors, especially those related to changes in the production environment (see *e.g.* Aaronson and Coronado, 2005), such as a trend towards greater labour market flexibility, shorter job tenures, the decline in the unionised share of the workforce, and the increase in the participation of women in the labour force. Nonetheless, this shift has been reinforced by recent experiences of plan sponsors with funding gaps and pressures to fill them.⁵

IV. Reassessment of pension fund asset allocations and financial market implications

Reassessment of pension fund asset allocation strategies

Changes in regulatory and accounting standards have influenced pension fund asset allocation strategies

Changes in regulatory and accounting standards have also influenced pension fund asset allocation strategies.⁶ As a result of changes in accounting, such as the introduction of International Financial Reporting Standards (IFRS), listed firms have to incorporate pension liabilities in their financial statements. This change may imply wider fluctuations in a firm's short-term earnings reports or the equity/reserve position in its balance sheet, unless the variability of pension funding ratios is reduced. Indeed, to prevent financial losses in their pension plan adversely affecting their core business activity, a sharper focus is being placed by companies on asset-liability matching.

This change in focus is reinforced by regulatory and pension fund accounting developments, which aim at enhancing benefit security against the background of funding gaps and a few high-profile losses of pension benefits due to bankruptcy of plan sponsors leaving underfunded pension schemes. Strong funding rules have been used in some countries, including the Netherlands where funding buffers are required to take account of volatility in assets. Others, such as the United Kingdom, have introduced pension benefit guarantee schemes which take on the pension liabilities of insolvent plan sponsors, and which will charge risk-based fees for such insurance coverage. As regards pension fund accounting, bond yields are increasingly used by regulators as the discount rate for liabilities. This choice implies that pension fund managers wishing to limit the volatility of their regulatory funding ratio may hold a larger allocation of assets with a high correlation to the discount rate used for liabilities. These developments imply a more risk-based approach to pension regulation and supervision (see also Box 1), providing a greater incentive for pension funds managers to consider matching assets and liabilities more closely. As a result, the traditional focus on producing an asset portfolio return defined in relation to a benchmark is increasingly replaced by attempts to better match assets with liabilities.

Box 1. OECD Guidelines on Pension Fund Asset Management

The OECD has published “Guidelines on Pension Fund Asset Management”, which were approved as a recommendation of the OECD Council on 26 January 2006. The Guidelines require that the retirement income objective of the fund is taken into account when making asset allocation decisions. Specifically, they encourage plan sponsors to manage their pension funds prudently in order to avoid pension benefit losses. The OECD guidelines on pension fund asset management are based on the prudent person principle and only allow quantitative limits that are consistent with that principle. The guidelines identify some quantitative limits that may be considered “prudent” such as limits in exposure to a single security or issuer (especially limits on exposure to the plan sponsor, which are actively encouraged). On the other hand, limitations on foreign investment and other broad asset classes (such as equities, bonds, etc.) are considered as potentially constraining portfolio efficiency. Whether or not such limits actually compromise a fund's performance and security will depend on the level at which they are set and the fund's investment strategy. The guidelines also highlight the need for effective risk management processes for the fund's assets and liabilities and support the identification of a level of asset-liability matching that can be monitored by the pension fund's governing body. Such matching techniques are most relevant for pensions in payment and would naturally lead to a greater exposure to bonds by pension funds with large proportions of pensioners.

The greater focus on asset-liability management typically involves a shift away from equity to bonds, especially to government bonds given their limited credit risk

The implications of a greater focus on asset-liability matching in terms of specific asset choices are not clear *a priori*, as the debate on the ideal asset match for pension funds liabilities continues. Nonetheless, there seems to be a growing consensus that the greater focus on asset-liability management typically involves a shift of pension fund assets away from equity to bonds, especially to government bonds given their limited credit risk. Indeed, according to the specialised pension fund press, a very large number of market analysts and practitioners believe that the greater focus on asset-liability matching is triggering an increased demand from pension funds for bonds and, supply permitting, a shift in asset allocations away from equity into bonds (although investments in alternative assets promising relatively higher returns have also increased in many cases).

Implications for long-term interest rates

Heightened demand from pension funds for long-term government bonds has been regularly cited in the press as one of the determinants behind the relatively low level of long-term interest rates. There are, of course, other factors that can explain the low level of long-term interest rates: e.g., high confidence in the ability of central banks to maintain inflation at low levels, lower inflation risk and real term premia as the volatility of real economic activity and inflation decline, lower risk premia due to better risk management through financial innovation, a higher supply of savings relative to the demand for productive fixed capital formation, etc. While many variables can be having an effect, the role of changes in pension fund asset allocation strategies has most likely been to amplify and perhaps to speed up, although not to trigger, the decline in yields (see also Knight, 2006).

There have been changes in reported pension fund asset allocations away from stocks and into bonds in some countries over the past few years

Whether and to what extent pension fund asset allocations have already changed in favour of a greater share of bonds is not so clear, however. It is often difficult to say to what extent observed changes in portfolio compositions reflect changes in strategic allocations as opposed to valuation changes. There have been changes in reported pension fund asset allocations away from stocks and into bonds in some countries over the past few years, but some of these shifts seem to have weakened more recently as equity markets have been stronger. As well, developments in asset allocations differ across countries. The shift into bonds may be noticeable in the case of pension fund asset allocations in the United Kingdom and the euro area, but less so in the United States. Analysing developments across countries is complicated, however, by the lack of reasonably long time series of harmonised data for the major OECD markets. In any case, even if the empirical evidence regarding actual portfolio allocations into bonds so far is mixed in some constituencies, some other investors may be acquiring bonds in anticipation of such shifts occurring in the future.

Measures of “scarcity” of government bonds

One potential challenge for the implementation of pension-related investment strategies stems from the absence of sufficient quantities of sustainable assets

Long-term bond demand from pension funds may have been limited so far not least because yields are currently very low and bond prices high. In this context, note that for some time now, many authors have argued that one potential challenge for the implementation of pension-related investment strategies stems from the absence of sufficient quantities of suitable assets to enable institutions to match long-term assets and liabilities (Thompson, 2003). In particular, the potential scarcity in many markets of long-term high-credit-quality bonds, such as government bonds, has received considerable attention. Much of the discussion has been couched in qualitative terms, however. A quantitative investigation can offer additional insights (see Schich and Weth, 2006).

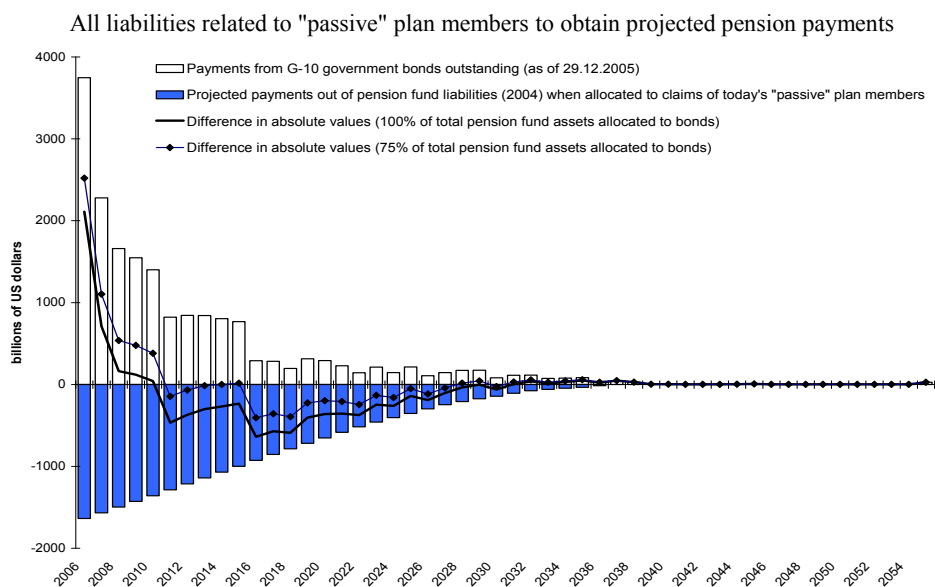
One measure of “scarcity” is the ratio of pension fund balance sheets to outstanding government bonds

One measure of “scarcity” can be obtained by comparing the size of pension fund balance sheets with the amounts of outstanding government debt instruments. Such a measure has the advantage that its calculation is straightforward. One shortcoming, however, is that the measure abstracts from the maturity of outstanding bonds and term of pension liabilities. Indeed, it essentially assumes that short-term bonds are perfect substitutes for long-term government bonds. In practice, however, pension funds’ potential demand for government debt instruments may vary across maturity segments.

Another measure compares the time patterns of future pension fund payment promises with the cash flows obtained from investing in government bonds

Another measure of “scarcity” that allows for variation of potential bond demand across the maturity spectrum can be obtained by comparing the time patterns of (estimates of) future pension fund payment promises with the cash flows that pension funds could obtain from investing in government bonds; that is, coupon payments and principal repayments. Hence, one compares two types of cash flows. Such a comparison is similar in approach to the strategy of cash-flow matching, whereby pension fund managers attempt to immunise their balance sheets by matching projected payouts with income generated by investments in government bonds. The cash flows implied by the current stock of outstanding G10 government bonds is then compared to projections of aggregate payment promises from pension funds to their current plan members.

Figure 2: Cash flows from government bonds and projected pension payments in G10 countries



Notes: Cash flows from outstanding G10 government bonds on the positive axis (as of December 2005). On the negative axis are estimates of payment promises by pension funds to beneficiaries in G10 countries, assuming that payments are due only to existing "passive" plan members. Passive plan members are defined as people 65 years of age or older in 2005.

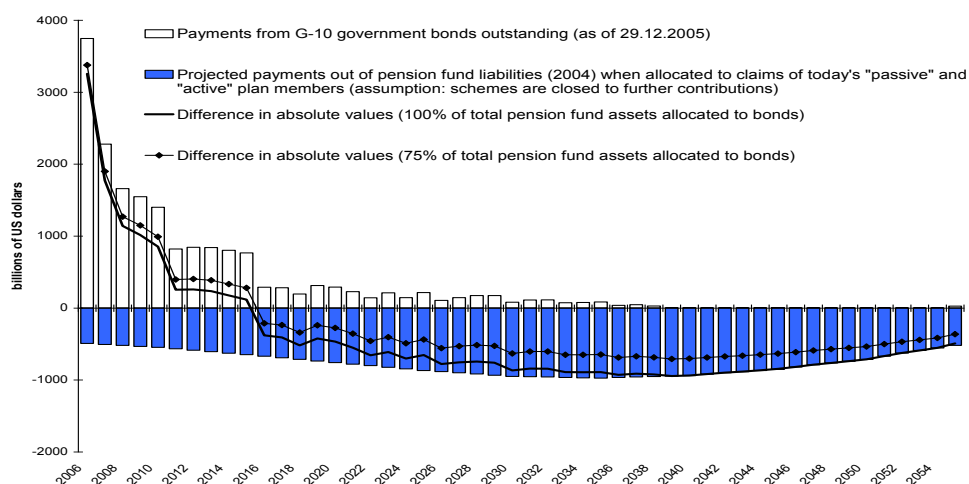
Source: Schich and Weth (2006).

As comprehensive data on pension fund liabilities are unavailable to us, data on pension fund assets are used to proxy liabilities. As the term structure of payment promises out of pension liabilities is not known,⁷ one needs to estimate the distribution of expected pension payouts. The estimate is obtained as follows: demographic variables such as the current population age structure and mortality dynamics (based on projected age- and time-specific conditional survival probabilities) are used to approximate the demographics of pension plan beneficiaries, assuming that each beneficiary, upon reaching retirement age, receives an equal real payment in each year of his remaining life time (*i.e.* similar to an inflation-indexed life annuity). The results are shown in Figure 2. An additional assumption underlying Figure 2 is that no new liabilities

are incurred and that all current liabilities are owed to “passive” plan members (“passive” essentially means not contributing to the pension plan). The figure shows that pension fund demand for fixed-income (government) bonds of high quality could exceed the current supply of such bonds by a considerable margin.

Figure 3: Cash flows from government bonds and projected pension payments in G10 countries

Liabilities related to “active” and “passive” plan members to obtain projected pension payments



Notes: Cash flows from outstanding G10 government bonds on the positive axis (as of December 2005). On the negative axis are estimates of payment promises by pension funds to beneficiaries in G10 countries, assuming that payments are due to “passive” as well as “active” plan members (assuming that the pension fund is closed to additional contributions). “Passive” plan members are defined as people 65 years of age or older in 2005. Active plan members are defined as 20 year-old people up to 64-year old people in 2005.

Source: Schich and Weth (2006).

To test the robustness of these results the assumption that no new liabilities are incurred is dropped and it is instead assumed that (estimated) liabilities are owed both to current “active” and “passive” members, and that “active” plan members will continue to accumulate pension claims.

Again, data on general population demographics in the G10 countries is used to proxy the “population” of pension plans, and it is assumed that people older than 25 years have acquired pension claims as a function of their age. The results are shown in Figure 3, and they are broadly similar to those in Figure 2.

Pension fund demand for high-quality (government) fixed-income bonds could exceed the current supply by a considerable margin

Potential “scarcity” could be greatest in absolute values in the United States and in the maturity segment beyond ten years

Thus, under a set of simplifying assumptions, the measures of “scarcity” obtained suggest that pension fund demand for high-quality (government) fixed-income bonds would exceed the current supply by a considerable margin. The estimated potential shortages vary noticeably across currency and maturity segments, however. According to these measures, potential “scarcity” would be greatest in absolute values in the United States (although not shown in the figure that aggregates data over the G10 countries) and in the maturity segment beyond ten years. Whether these “scarcity” estimates measure pension funds’ potential demand for government bonds and to what extent part of this demand is already being met and, thus, reflected in current bond prices is uncertain, however. What is certain is that the potential demand could be very substantial. Given the current size of government bond markets, pension funds are sufficiently large that any significant changes in their asset allocations towards these instruments could have an effect on prices, even if such changes occurred in a gradual fashion, which appears to be a realistic assumption.

V. Selected policy issues

Heightened demand from pension funds for long-term government bonds has certainly had an effect on the level of long-term interest rates in some markets, although it is hard to quantify this effect. Unfortunately, our understanding of recent actual developments in pension fund asset allocations across different markets (and the effect that such changes might have had on interest rates) is incomplete, in part related to the limited data availability in this area. It is certain, however, that the potential demand from such entities could be very substantial. This in turn raises a number of different policy issues.

Debt managers may want to issue long-term bonds because current conditions allow them to lock in relatively low financing costs for long time horizons

But whether debt managers should issue bonds with the aim to facilitate the task for pension fund managers is a different matter

Policy makers expect the price mechanism to clear apparent imbalances

To the extent that a scarcity of suitable pension fund investments emerges, the question arises what steps, if any, governments should take in response. For example, should governments adjust their debt issuance strategy to address the issue of scarcity of high-quality long-duration bonds? Clearly, debt managers may want to issue long-term bonds because current conditions allow them to lock in relatively low financing costs for long time horizons. Indeed, many governments have done exactly that and have issued long-term as well as ultra-long-term bonds with maturities of, for example, 50 years.

But whether debt managers should issue bonds with the aim to facilitate the task for pension fund managers is a different matter. This matter was discussed at meetings of the OECD's Committee on Financial Markets (CMF) and its Working Party on Public Debt Management. Delegates would not recommend that governments undertake to issue long-term debt with the express intent of meeting this demand, not least because they expected the price mechanism to clear apparent imbalances in asset markets. In this context, there have been reports in the financial press that pension funds increasingly use synthetic swap-based products to match their liabilities. As well, markets for infrastructure assets, characterised by long-term revenue streams, have been growing rapidly owing, in large part, to heightened demand from pension funds. Governments may want to take other steps to develop a market for these bonds, however. Such steps could include making available, in suitable form, statistics on demographic developments collected by national statistical officers. This would facilitate the production of longevity indices by private market participants.

Furthermore, debt managers have relatively narrowly defined objectives in terms of minimising public borrowing costs. However, there is some pressure on debt managers to reconsider the breadth of the objectives of public debt management. While cost-effectiveness of instruments is an important criterion, governments have also indicated that the objective of their issuance strategies goes beyond the minimisation of borrowing costs. In any case, the transparency about developments in the pension fund sector should be increased. For example, there is a need for

harmonised data on pension funds asset allocations, ideally available with short lags and going back in time. As part of the efforts made by authorities to address this issue, in 2002, the OECD launched, through the Working Party on Private Pensions and the Task Force on Pension Statistics (subsidiary bodies of the OECD Insurance and Private Pensions Committee), a project to establish a harmonized set of statistics and indicators related to funded pensions that is called the *Global Pension Statistics Project*.⁸

Notes

1. Note that the size of pension funds, as measured by their asset values, in turn depends on financial market developments. For example, reflecting weak equity markets, pension fund assets as a share of total financial assets in the economy have grown relatively less rapidly during recent years as compared to earlier periods, at least in those countries where these entities have a relatively higher equity market exposure than other types of asset holders.
2. The above definition applies to occupational pension plans, but not to personal pension plans. Thus, strictly speaking, the definition applies to private pension funds only to the extent that the funds are occupational, rather than personal. Occupational pension plans are pension plans to which access is linked to an employment or professional relationship between the plan member and the entity that establishes the plan (the sponsor). Personal pension plans are plans that do not have to be linked to an employment relationship. Such plans are established and administered directly by a pension fund or a financial institution acting as pension provider without any intervention of employers.
3. The following discussion draws in part on Schich (2005).
4. For example, the OECD Committee on Financial Markets (CMF) discussed funding deficits in occupational funds in its “Tour d’Horizon on Financial Markets” at its October 2003 meeting. In the context of that discussion, the Committee directed the Secretariat to prepare and distribute to Delegates a questionnaire on the implications of funding gaps and on regulatory and other policy responses to address them. A note summarising responses to the questionnaire was discussed at the October

2004 CMF meeting, and an updated and revised note was published in the Financial Market Trends in March 2005.

5. The shift is also modifying the risk profile of the household sector by exposing it more directly to financial and other risks. Against this background, protection of pension beneficiaries becomes an even more important issue, and standards of financial literacy and the provision of advice may need to be strengthened. Indeed, surveys of financial literacy conducted in G10 countries show that consumers also lack the awareness of the need to be better “educated” on financial matters. Guidance to improve “financial literacy” of households are given in the OECD Principles and Good Practices for Financial Education and Awareness. These principles draw on an international study by the OECD on the availability of financial education programmes (OECD, 2005).
6. As regards pension funding gaps, two opposing effects may influence pension fund investment strategies, however. One effect consists of a trend towards greater asset-liability matching to avoid volatility, and this effect, which appears to be dominating, is discussed in the main text. Another effect is that defined-benefit pension funds facing large funding gaps have an incentive to invest in riskier assets to be able to return to positive funding levels. Indeed, one trend underway in pension fund management is the increased allocation to alternative asset classes, such as hedge funds, private equity, commodities, although the relative shares invested in these assets typically do not exceed a few percentage points.
7. A distinction between defined benefit and defined contribution schemes is not made in the estimates, as complete data on that breakdown for G10 countries was unavailable.
8. Within the framework of pension regulation and supervision, pension funds are required to submit comprehensive sets of published and non-published data to their national pension authorities. The OECD Global Pensions Statistics Project, in turn, collects parts of that data and combines them to construct a cross-border database on developments in pension funds. The scope of the database is very comprehensive, as all authorised pension funds are normally covered by this project. The data are regularly published in the bi-annual publication Pension Market in Focus (<http://www.oecd.org/daf/pensions/gps>).

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Governments and the Market for Longevity-indexed Bonds

Pablo Antolin and Hans Blommestein

Uncertainty about length of life, longevity risk, is a growing financial problem for pension funds and annuity providers. Unfortunately, there is a lack of financial instruments to hedge against this longevity risk, thereby complicating risk management by pension funds and hindering the expansion of the annuity market. Consequently, this paper examines the role of government in promoting a private market solution for longevity hedging financial products. Governments could in principle improve the market for annuities by issuing longevity-indexed bonds and by producing a longevity index. The paper argues that the first public policy role is hampered by the fact that governments are themselves already exposed to significant longevity risk. However, governments could take other steps such as producing a reliable longevity index.

Governments and the Market for Longevity-indexed Bonds

Pablo Antolin and Hans Blommestein*

I. Introduction

Uncertainty about longevity poses risks

Uncertainty about future improvement in mortality and life expectancy poses important risks. Increased longevity is a long-term trend, seemingly in one direction only. At the heart of longevity as a problem for society is uncertainty about the rate of improvements in life expectancy and mortality that may have an adverse impact on social welfare. This uncertainty is mainly about speed and magnitude, not the direction. Uncertainty about length of life, that is longevity risk, carries the risk that individuals run out of resources, thereby forcing them to reduce their standard of living at old age. Longevity risk is also a growing financial problem for private companies and governments that manage defined-benefit pension

* The authors are from the Financial Affairs Division of the OECD Directorate for Financial and Enterprise Affairs, where Pablo Antolin is Principal Economist in the Private Pensions Unit and Hans Blommestein is the Head of the OECD Public Debt Management and Emerging Financial Markets programmes. The authors would like to thank André Laboul, Fiona Stewart and Juan Yermo for comments on earlier drafts. They also thank Delegates to the Working Party on Private Pensions of the OECD Insurance and Private Pensions Committee for useful discussions, and participants at the SUERF meeting in Lisbon on October 12, 2006. The views expressed herein are those of the authors and do not necessarily reflect those of the OECD or the governments of its Member countries. The authors are responsible for any remaining errors. A previous version of this article has been published as OECD *Discussion Paper on Insurance and Private Pension Issues* No. 4 (January 2007).

schemes as well as for annuity providers. They run the risk that the net present value of their pension promises and annuity payments will turn out higher than expected, as they will have to pay out a periodic sum of income that will last for an uncertain life span. Longevity risk is therefore a problem for defined benefit programmes and annuity products.

Lack of financial instruments to hedge against longevity risk

Unfortunately, there is a lack of financial instruments to hedge against this longevity risk. Pension funds and annuity providers would like to transfer longevity risk to institutions better placed to deal with it. However, although financial instruments to hedge against interest rate and inflation risks are readily available, there is a lack of similar instruments to hedge against longevity risk, thereby complicating risk management by pension funds and hindering the expansion of the annuity market. Consequently, governments could encourage ways in which annuity providers and DB-plan sponsors could better hedge their life expectancy risks; for example, by supporting market-based solutions to address longevity risk.

Role of government in promoting a market solution for longevity hedging products...

This paper examines therefore the role of government in promoting a private market solution for longevity hedging financial products. To that end, the paper examines in Section II different channels to transfer longevity risk, including an assessment of the prospects for capital market solutions. It concludes that in practice it is unlikely that the private sector will be successful in the short-term. In this context, Section III examines the failure of the so far only privately issued longevity bond. Section IV argues that the problem with market solutions is that longevity risk does not manifest itself only as idiosyncratic risk (unique to each individual) but also as an aggregate risk (uncertainty about overall rates of population mortality improvement). As a result of this aggregate longevity risk, a significant private sector-driven market in longevity products is unlikely to develop in the near future. Moreover, annuity providers are forced to charge higher prices per unit of annuity pay-out so as to compensate for this un-hedged aggregate risk.

...through issuing longevity-indexed bonds and producing a longevity index

Against this backdrop, governments could in principle improve the market for annuities by issuing longevity-indexed bonds and by producing a reliable longevity index. Governments could provide liquid, pricing benchmarks by issuing survivor or longevity-indexed bonds (Blake and Burrows, 2001). However, this may in practice be not so simple as governments are themselves heavily exposed to longevity risk through public pension systems and social security schemes (Blommestein, 2006). Section V examines therefore the amount of longevity risk already incorporated in governments' balance sheets so as to support the argument that governments are already exposed to significant longevity risk. But governments can encourage or support the development of a private market in longevity hedging products in different ways; for example, by producing a reliable and widely accepted longevity index to be used for designing privately issued hedging products. Section VI discusses a tentative proposal how governmental institutions, in particular national statistical institutes, could develop a longevity index that can be incorporated into a private bond. The final section of the paper summarises the main conclusions.

II. Channels to transfer longevity risk

Several private sector channels available to transfer longevity risk...

Pension funds and annuity providers can manage the risk that their pay-out commitments may turn out to be higher than expected (longevity risk) by transferring this risk. This section looks therefore into several private sector channels that can be used to transfer this risk.

...through the financial system or directly to individuals

Pension funds and annuity providers can transfer longevity risk through the financial system or directly to individuals. Transferring longevity risk to individuals has been done by shifting from defined benefit to defined contribution pension plans, as well as by offering fixed-term annuities where the length of time the annuitant will be receiving payments is capped. This solution will generally speaking not enhance social welfare.¹ Transferring the longevity risk of pension funds and annuity providers through the financial system can in

principle take place via four principal channels:²

- Protection seeker takes insurance from re-insurers.
- Conversion of DB benefits to annuities via bulk “buyouts”.
- Annuity provider writes balancing insurance product.
- Capital market solutions.

Re-insurance companies reluctant to take on significant longevity risk

Re-insurance companies have a fairly limited underwriting capacity. As a rule, re-insurers do not take on longevity risk, unless it is for an existing client and part of an overall package of risks, while capped at a relatively small level (Richards and Jones, 2004). As a result, the appetite of re-insurers for longevity risk transaction seems to be rather small at this stage, although this situation can improve with more precise knowledge of this risk and growing risk transfer demand.

DB buyouts are expensive

Also the capacity of the buyout market is rather small. The conversion of DB benefits to annuities is very expensive, while the insurance capacity is very limited. Actually, the UK buyout market has shrunk, with only two major re-insurers active (Bryne and Harrison, 2005).

Hedging through balancing products

The third way of transferring longevity risk is based on hedging through balancing products. An obvious example is the case where a holder of longevity risk would enter into a contract with a term assurance portfolio, thereby combining a conventional level annuity with a whole-life assurance to the value of the cost of the annuity. The resulting combination of the underlying risks (mortality and longevity risk) would then reduce an insurer's exposure to future increases in longevity, thereby also reducing the capital reserves held against this risk.

Longevity bonds as capital market solution

The very limited capacity of the first three channels for transferring longevity risk has prompted the search for capital market solutions. The capital market channel for transferring longevity risk would allow protection seekers to buy longevity bonds. Proposed solutions for reducing the exposure to longevity risk of pension funds and

annuity providers are conceptually simple, as they require the construction of capital market instruments linked to a reliable longevity index. Given a suitable index it would be possible to construct longevity bonds with either the coupon or principal (or both) at risk of default if longevity improvements in excess of expectations occurred (Richards and Jones, 2004). These instruments can then be used to hedge mortality and longevity risk.³ Although life insurers and pension funds have similar liabilities, they have different perspectives (Roberts, 2005). Insurance companies are concerned about potential catastrophic losses, while pension plans aim to protect corporate cash flows from incremental losses.

But short-term success of private sector solutions is unlikely

We conclude that in practice it is unlikely that the private sector will be successful in the short-term,⁴ as the experience of the only longevity-indexed bond issue by a private institution, examined in the next section, seems to confirm.

III. Why has the EIB/BNP longevity bond failed?⁵

Longevity-indexed bond issuance failed to generate enough demand...

The only longevity-indexed bond issued by a private institution failed to generate enough demand. This longevity-indexed bond was structured by BNP Paribas and issued by the European Investment Bank (EIB).⁶ The EIB/BNP longevity bond was only issued for the UK pension market as its payments were linked to a cohort survivor index based on the realised mortality rates of males aged 65 in 2003 in England and Wales.

...due to pricing issues...

There are several factors that explain this failure. The immediate explanation for its failure was to argue that it was overpriced. However, most studies consider that the EIB/BNP longevity bond was not over-priced; if anything, it was under-priced (Cairns *et al.*, 2005; and Friedberg and Webb, 2005). The lack of demand suggests that other concerns played a more decisive role.

...special risk characteristics...

It seems likely that the EIB/BNP longevity bond failed because longevity risk is an economic risk different from interest rate - or inflation risks. Longevity risk is a long-term risk with low volatility. Moreover, asset-liability matching rules and other regulatory requirements

...and insufficient regulatory benefits

are not effective in encouraging pension funds to hedge this aggregate risk. There were therefore insufficient regulatory benefits for UK pension funds to buy this longevity bond. In addition, pension funds use current mortality tables without taking into account forecasts, and only adjust mortality assumptions every 10 years (Antolin, 2007). As a result, there are insufficient incentives to internalise the cost of unexpected gains in longevity.

There are also design problems...

There were also problems with the design of the issue. First, the bond issued had a limited longevity index. The coupon was linked to the survivor index of men in England and Wales. Secondly, it had a limited coverage because the maximum longevity was capped at 25 years. Therefore, it was a partial hedge as the risk arising from an increase in longevity beyond the cap would not be hedged by the bond.

...and difficulties in assessing its usefulness

Finally, it was noted that trustees and pension fund managers did not seem to understand the usefulness of the product. Pension fund trustees found it difficult to comprehend. While the basic idea was relatively straightforward and easy to understand, pension fund trustees had to assess how such an instrument would fit in the overall pension portfolio and examine all the potential consequences (economic, financial, regulatory, etc.). This is a lengthy process and there is a clear sunk cost in bringing such an ice-breaker transaction to the market.⁷

The obstacles related to privately-issued longevity-indexed bonds have prompted many analysts to suggest a central capital market role for public policy. However, as outlined below, this public policy role is seriously hampered by the fact that governments are themselves already exposed to significant longevity risk.

IV. Governments and efficient sharing of longevity risk

Distinction between individual and aggregate longevity risk is important

The role of public policy in sharing longevity risk depends on the distinction between individual and aggregate longevity risk. Idiosyncratic (individual or micro) longevity risk (survival risk) can in principle be tackled in an efficient risk sharing fashion via annuities

markets. Unfortunately, private annuity markets are affected by adverse selection. Government regulations (in the form of *e.g.* mandatory participation rules) can in principle address this type of market failure. Aggregate (macro or cohort) longevity risk affects current cohorts in roughly the same way. Positive correlations across individuals mean that private market solutions cannot be used to share this risk efficiently (Bohn, 2005). Standard tools to reduce exposure to this macro risk (diversification across cohorts, international diversification via cross-border investments, risk sharing with annuitants, or hedging of insurance companies by selling both annuities and life-insurance) cannot completely eliminate it.

Intergenerational risk sharing not possible via private markets...

Financial markets (including insurance) work efficiently for sharing short-term risks between cohorts (with largely overlapping lifetimes) but not for the long-term life risks of older cohorts that are largely known when the younger cohorts arrive. *Ex ante* efficient intergenerational risk sharing via private markets is therefore not possible as future generations cannot be included.

...but public policy can in principle provide a solution

The government, on the other hand, can use fiscal policy (taxes, social insurance, transfers and public debt) as a vehicle to spread risk across generations, thereby (in theory) improving social welfare. To put it differently, governments have in principle the ability to make markets more complete by providing longevity insurance backed by future generations (Brown and Orszag, 2006).

Policy needs to consider general equilibrium effects

However, government interventions need to take several considerations into account (Bohn, 2005). First, government policy needs to include important general equilibrium effects of aggregate longevity risks. A (permanent) macro longevity shock not only increases systematically life spans, but has also macro-economic effects via changes in factor prices and the capital-labour ratio. It is therefore possible that a longevity shock will increase the (future) supply of labour and decrease (future) wages.⁸

Government can enforce inter-generational contracts...

A second consideration is that future (“new”) generations are subject to at least the same longevity shock as the current (“old”) generation. But the key difference in terms of impact is that the new generation

can use their entire life-span to adjust labour supply, consumption and savings to a jump in longevity, while this is not the case for the old generation (Brown and Orszag, 2006). This perspective creates the possibility of creating welfare gains by sharing some of the financial risks of longevity shocks for the old generation with future generations. And only the government has the power to enforce inter-generational contracts.⁹

...but inter-generational risk-sharing policies may not be optimal in practice

A third consideration is that although governments have in principle the tools to spread efficiently longevity risk across generations, this may not occur in practice. Optimal inter-generational risk-sharing may be distorted by taxes (Bohn, 2005) and social security arrangements (Brown and Orszag, 2006). This means that the optimal degree of inter-generational risk-sharing has not been moved onto the right generation. Governments are already heavily involved in inter-generational risk-sharing via public pensions and other social security arrangements. It is difficult to demonstrate but the distorting influence of “politics” makes it unlikely that this corresponds to the optimal amount of risk-sharing. For the same reason it is likely that today’s inter-generational arrangements favour the current generation (of voters) at the expense of future generations (Heller, 2003).

Governments are already exposed to longevity risk

Finally, governments themselves are – on a balance sheet basis -- already exposed to longevity risk. Issuing longevity-indexed bonds will further increase this exposure.

V. What is the exposure of governments to longevity risk?

EC study on the impact of ageing on public finances

The aim of this section is therefore to assess the amount of longevity risk already incorporated in the balance sheet of national governments resulting from their public pension systems. For this purpose, the paper uses data from the latest report by the Economic Policy Committee and the European Commission (DG ECFIN) concerning the impact of ageing on public expenditure in the period 2005-2050 (EC, 2006). The EC exercise provides a measure of the impact of ageing on public finances via the calculated increase in life expectancy that affects the dependency ratio, as well as via a sensitivity

analysis of the impact of ageing to changes in the underlying assumptions regarding life expectancy.

Impact stems from both foreseeable and unforeseeable improvements in life expectancy

The impact of longevity on public finances stems from both foreseeable and unforeseeable improvements in life expectancy. However, as longevity risk refers to the uncertainty surrounding future life expectancy outcomes, only the impact of unforeseeable changes in life expectancy measures longevity risk. However, in the case of social security, where benefits are in general independent of changes in life expectancy, any improvement in life expectancy, even if foreseeable, will increase public expenditure.

The impact of foreseeable improvements in life expectancy

Impact of ageing on public finances stems from pure demographic as well as labour market and pension system effects

The impact of foreseeable improvements in life expectancy can be gauged by examining the impact of the dependency ratio of the very old (those aged 80+) on public finances. The impact of ageing on public finances can be broken down into its constituent parts: the pure impact of demographics, the impact of labour markets and the impact of the parameters of the pension systems.¹⁰ The effect of increases in the dependency ratio measures the pure demographic impact. Additionally, increases in the dependency ratio are due to the gradual shift of the baby boom generation from the workforce into retirement, the increase in life expectancy implicitly assumed in the projections, and the smaller size of the cohorts entering the labour market. Therefore, the impact on public expenditure of improvements in life expectancy can be gauged by separating this effect from the other two factors. This can be achieved by assuming that the increase in the share of people aged 80+ is a measure of the population impact of improvements in life expectancy.¹¹

Improvements in life expectancy will increase pension expenditures by around 4.5% of GDP

As the increase in the dependency ratio is just over 50% due to increases in the share of those aged 80+, improvements in life expectancy will increase pension expenditures by around 4.5% of GDP. Using the projected changes in the size and age structure of the population reported in Table 1, the change in the dependency ratio (people aged 65+ over people aged 15 to 64) from 2004

to 2050 can be disaggregated into the change in the ratio of people aged 65 to 79 over the working age population and the change in the ratio of people aged 80+ over the working age population. The changes in these three ratios for the EU15 are 26.04, 12.5 and 13.6%, respectively. Keeping the share of those aged 80+ constant at its 2004 level, the increase in the dependency ratio would only be 12.5 percentage points instead of 26. Therefore, just over 50% of the increase in the dependency ratio is due to an increase in the proportion of people aged 80+, that is, to improvements in life expectancy. Therefore, as the projected increase in public pension expenditures due to increases in the dependency ratio is 8.2% of GDP for the EU15 and 8.6 for the EU25 (Table 2),¹² the increase due to projected improvements in life expectancy would be around 4.5 percentage points of GDP.

Table 1. Projected changes in the size and age structure of the population

2004-2050

	Population (millions)									Dependency ratio (%)												% c du pe age
	Total			Working age (15-64)		Old age (65+)		Very old (80+)		Old age population over working age			People aged 65-79 over working age			Very old population over working age						
	2004	2050	2004	2050	2004	2050	2004	2050	2004	2050	Diffe- rence	2004	2050	Diffe- rence	2004	2050	Diffe- rence					
BE	10.4	10.8	6.8	6.3	1.8	3.0	0.4	1.2	26.5	47.6	21.1	20.6	28.6	8.0	5.9	19.0	13.2	6				
DK	5.4	5.5	3.6	3.3	0.8	1.4	0.2	0.5	22.2	42.4	20.2	16.7	27.3	10.6	5.6	15.2	9.6	4				
DE	82.5	77.7	55.5	45.0	14.9	23.3	3.4	9.9	26.8	51.8	24.9	20.7	29.8	9.1	6.1	22.0	15.9	6				
GR	11.0	10.7	7.5	5.9	2.0	3.6	0.4	1.2	26.7	61.0	34.4	21.3	40.7	19.3	5.3	20.3	15.0	4				
ES	42.3	43.0	29.1	22.9	7.1	15.0	1.8	5.3	24.4	65.5	41.1	18.2	42.4	24.1	6.2	23.1	17.0	4				
FR	59.9	65.1	39.0	37.4	9.8	17.4	2.6	6.9	25.1	46.5	21.4	18.5	28.1	9.6	6.7	18.4	11.8	5				
IE	4.0	5.5	2.7	3.2	0.4	1.4	0.1	0.4	14.8	43.8	28.9	11.1	31.3	20.1	3.7	12.5	8.8	3				
IT	57.9	53.8	38.5	29.3	11.1	18.2	2.8	7.2	28.8	62.1	33.3	21.6	37.5	16.0	7.3	24.6	17.3	5				
LU	0.5	0.6	0.3	0.4	0.1	0.1	0.0	0.1	33.3	25.0	-8.3	33.3	0.0	-33.3	0.0	25.0	25.0					
NL	16.3	17.6	11.0	10.6	2.3	4.3	0.6	1.6	20.9	40.6	19.7	15.5	25.5	10.0	5.5	15.1	9.6	4				
AT	8.1	8.2	5.5	4.7	1.3	2.5	0.3	1.0	23.6	53.2	29.6	18.2	31.9	13.7	5.5	21.3	15.8	5				
PT	10.5	10.1	7.1	5.5	1.8	3.2	0.4	1.1	25.4	58.2	32.8	19.7	38.2	18.5	5.6	20.0	14.4	4				
FI	5.2	5.2	3.5	3.0	0.8	1.4	0.2	0.5	22.9	46.7	23.8	17.1	30.0	12.9	5.7	16.7	11.0	4				
SE	9.0	10.2	5.8	6.0	1.5	2.5	0.5	0.9	25.9	41.7	15.8	17.2	26.7	9.4	8.6	15.0	6.4	4				
UK	59.7	64.2	39.2	37.8	9.5	17.0	2.6	6.5	24.2	45.0	20.7	17.6	27.8	10.2	6.6	17.2	10.6	5				
CY	0.7	1.0	0.5	0.6	0.1	0.3	0.0	0.1	20.0	50.0	30.0	20.0	33.3	13.3	0.0	16.7	16.7	5				
CZ	10.2	8.9	7.2	5.0	1.4	2.8	0.3	0.8	19.4	56.0	36.6	15.3	40.0	24.7	4.2	16.0	11.8	3				
EE	1.4	1.1	0.9	0.7	0.2	0.3	0.0	0.1	22.2	42.9	20.6	22.2	28.6	6.3	0.0	14.3	14.3	6				
HU	10.1	8.9	6.9	5.2	1.6	2.5	0.3	0.8	23.2	48.1	24.9	18.8	32.7	13.9	4.3	15.4	11.0	4				
LT	3.4	2.9	2.3	1.7	0.5	0.8	0.1	0.3	21.7	47.1	25.3	17.4	29.4	12.0	4.3	17.6	13.3	5				
LV	2.3	1.9	1.6	1.1	0.4	0.5	0.1	0.2	25.0	45.5	20.5	18.8	27.3	8.5	6.3	18.2	11.9	5				
MT	0.4	0.5	0.3	0.3	0.1	0.1	0.0	0.0	33.3	33.3	0.0	33.3	33.3	0.0	0.0	0.0	0.0					
PL	38.2	33.7	26.7	19.4	5.0	9.9	0.9	3.0	18.7	51.0	32.3	15.4	35.6	20.2	3.4	15.5	12.1	3				
SK	5.4	4.7	3.8	2.7	0.6	1.4	0.1	0.4	15.8	51.9	36.1	13.2	37.0	23.9	2.6	14.8	12.2	3				
SI	2.0	1.9	1.4	1.1	0.3	0.6	0.1	0.2	21.4	54.5	33.1	14.3	36.4	22.1	7.1	18.2	11.0	3				
EU25	456.8	453.8	306.8	259.1	75.3	133.3	18.2	49.9	24.5	51.4	26.9	18.6	32.2	13.6	5.9	19.3	13.3	4				
EU15	382.7	388.3	255.1	221.3	65.2	114.2	16.3	44.2	25.6	51.6	26.0	19.2	31.6	12.5	6.4	20.0	13.6	5				
Euro area	308.6	308.4	206.5	174.2	53.3	93.4	13.0	36.3	25.8	53.6	27.8	19.5	32.8	13.3	6.3	20.8	14.5	5				

Source: EC (2006) and OECD calculations.

Even though foreseeable, this puts public pension systems under financial pressures

However, this increase in pension expenditures is due to foreseeable improvements in life expectancy, which is, strictly speaking, not a proper measure of longevity risk. Nevertheless, as long as this (expected) impact is not addressed, public pension systems would be under longevity-induced financial pressures.

Table 2. Change in public pension expenditure from 2004 to 2050, contributions to this change and sensitivity analysis

Percentage points of GDP

	Expenditure on public pensions		Due to growth in						Increase pension expenditure as a result of higher life expectancy
			Dependency ratio	Employment rate	Take up ratio	Benefit ratio			
	Pop 65+/Pop(15-64)	Employed/pop(15-64)				Pensioners /Pop 65+	Average pension/GDP per worker	Interaction effect (residual)	
			2005	p.p. change 2005-2050					
BE	10.4	5.1	7.7	-1.5	-0.4	-0.6	-0.1	0.5	
DK	9.6	3.2	7.2	-0.4	-2.8	-0.5	-0.3		
DE	11.1	1.9	7.5	-1.1	-0.6	-3.5	-0.4	0.2	
ES	8.7	7.0	12.4	-1.8	-2.3	-0.8	-0.4	0.1	
FR	12.8	2.0	8.7	-0.9	-1.8	-3.5	-0.5	0.6	
IE	4.6	6.5	7.9	-0.5	-1.4	0.8	-0.2		
IT	14.3	0.4	11.5	-2.0	-3.2	-5.3	-0.7	0.3	
LU	10.0	7.4	7.2	-4.4	2.5	2.1	0.0	-0.1	
NL	7.4	3.8	6.3	-0.2	-1.6	-0.4	-0.3	0.8	
AT	13.2	-1.0	11.3	-1.3	-5.8	-4.3	-0.8	0.4	
PT	11.5	9.3	13.7	-0.2	-0.9	-3.0	-0.4	0.6	
FI	10.4	3.3	8.8	-0.9	-3.1	-0.9	-0.6	0.2	
SE	10.4	0.9	4.8	-0.6	-0.2	-2.8	-0.2	0.4	
UK	6.7	1.9	4.7	-0.1			-2.6		
CY	7.0	12.8	10.2	-1.2	1.2	2.5	0.1	-0.1	
CZ	8.5	5.6	10.5	-0.3	-3.5	-0.6	-0.6	0.4	
EE	7.1	-3.0	3.1	-0.6	-1.5	-3.8	-0.2	0.1	
HU	10.7	6.4	10.5	-1.1	-4.5	2.0	-0.4	-0.3	
LT	6.7	1.9	5.4	-1.0	-2.1	-0.2	-0.2	0.4	
LV	6.4	-0.9	3.4	-0.7	-1.3	-2.4	0.0	0.2	
MT	7.5	-0.5	7.3	-1.2	-1.0	-5.0	-0.6	0.5	
PL	13.7	-5.7	10.4	-3.2	-4.5	-7.5	-0.8	0.2	
SK	7.4	1.5	9.0	-1.3	-2.5	-3.1	-0.6	0.4	
SI	11.0	7.3	13.3	-1.0	-3.6	-0.9	-0.6	-0.4	
EU15	10.5	2.3	8.2	-1.0	-1.7	-2.8	-0.4	0.3	
EU25	10.6	2.2	8.6	-1.1	-2.1	-2.7	-0.4	0.3	

¹ Life expectancy one year higher in 2050 relative to baseline projection.

Source: EC (2006), Tables 3.3.; 3.10; and 3.29.

The impact of unforeseeable improvements in life expectancy

Sensitivity analysis to gauge the impact of changes in life expectancy...

Longevity risk is the risk that future life expectancy outcomes turn out differently than expected. Therefore, only the impact of unforeseeable changes in life expectancy can be thought of as longevity risk. The sensitivity analysis regarding the impact of changes in life expectancy on public expenditures provides a good proxy for the amount of longevity risk borne by the public sector over the next 45 years. The impact of unforeseeable improvements in life expectancy, on the other hand, is therefore gauged by this sensitivity analysis.

...suggests that 1-1.5 years of added life expectancy would increase public pension expenditure by 0.3 percentage points of GDP

The sensitivity analysis suggests that an unforeseeable improvement of around 1-1.5 years in life expectancy amounts to an increase in public pension expenditure of 0.3 percentage points of GDP. The EC report (EC, 2006) calculates the change in pension expenditures that would result of an improvement of life expectancy of around 1-1.5 years by 2050 over the increase already implicit in the underlying assumptions.¹³ This improvement would increase public pension expenditures by 0.3 percentage points of GDP over the period 2004-2050 (Table 2).

Longevity risk incorporated in governments' balance sheet may be close to 1.2 percentage points of GDP

However, the amount of longevity risk already incorporated in the balance sheet of governments may be closer to 1.2 percentage points of GDP. The increase in life expectancy at birth assumed in the EU (2006) report is around 1.1 year per decade, while the increase over the past 50 years has been close to 2.2 years per decade (Antolin, 2007).¹⁴ Therefore, if increases in life expectancy continue to follow past trends, life expectancy at birth would be 4-4.5 years higher than the increase implicitly assumed in the baseline EU projections. Assuming a proportional impact of each additional year increase in life expectancy, would result in an amount of longevity risk equal to 1.2 percentage point of GDP due to the public pension system.

Governments face challenging budgetary pressures...

As a result, governments will need to address budgetary pressures. But the amount of longevity risk is much lower than the projected 8.2% of GDP ageing impact on public finances, or the 4.5% of GDP impact of

improvements in life expectancy already incorporated in the projections. However, if this longevity risk of 1.2% of GDP would materialise, the resulting higher spending pressures would need to be addressed by a reallocation of resources from other spending items, an increase in tax revenues of 1.2% of GDP, an increase in the budget deficit of 1.2% of GDP or a combination.

*...which may
hamper the proposed
capital market role
for public policy*

Therefore, the proposed central capital market role for public policy by issuing longevity-indexed bonds is seriously hampered by the fact that – on a balance sheet basis -- governments themselves are already exposed to significant longevity risk. Issuing longevity-indexed government bonds would further increase this exposure to uncertainty about the length of life.

*OECD governments
have recently
implemented
measures to reduce
their longevity risk
exposure*

On the other hand, some OECD governments have recently implemented measures aimed at reducing their exposure to longevity risk; for example, by linking pension benefits to changes in life expectancy. As a result of these measures, longevity risk is being shifted to individuals, a situation that is likely to decrease social welfare.¹⁵

*Governments can
play an important
role in the
development of
longevity indices*

Although the current exposure of governments to longevity risk undermines the possible issuance of longevity-indexed public bonds, governments can play a different, though important, role in overcoming a number of important difficulties related to market practicalities such as the need for reliable indices and suitable types of indexation. Indices are needed so that they can be embedded in longevity-indexed bonds issued by the private sector. Since these indices provide the benchmark against which future mortality will be measured, they need to be simple and transparent, based on robust data, statistically reliable, credible, and calculated in an unbiased manner (Roberts, 2005). Statistics produced by government agencies can meet these criteria as long as they are allowed to act as independent professional institutions (*i.e.* they need to be free from day-to-day political pressures).

VI. Developing a simple longevity index

Supporting a market for longevity indexed products by developing a simple index for longevity risk

This section presents therefore a tentative proposal to develop a reliable, widely accepted index for longevity risk by governmental institutions, in particular national statistical institutes. The availability of such a government-supported index could encourage or promote a market for longevity-indexed products. In order to design such an index, this section first provides an operational definition of a simple longevity index and then examines what this index should ideally measure.

A longevity risk index defined as the probability of deviations of life expectancy from a central forecast...

A longevity risk index can be defined in operational terms as the probability that life expectancy for individuals at age i in year t will be m years higher than the central forecast for life expectancy, LRI (i, t, m) . National statistical institutes could provide this index for all ages and for all years from the latest available information up to n years. They could also calculate this index for different population subgroups according socio-economic characteristics (e.g. gender, income and educational level). Having indices for different population subgroups would help pension funds and insurance companies to calculate weighted average indices according to their specific membership structure (Antolin, 2007).

...based on stochastic methodology to forecast mortality rates and life expectancy...

In order to calculate a longevity risk index, governmental institutions would have to use a stochastic methodology to forecast mortality rates and life expectancy. For example, they could use the Lee-Carter and the Splines approaches (Antolin, 2007; and CMI, 2005, 2006). A stochastic approach permits to gauge the uncertainty surrounding future mortality and life expectancy outcomes and its associated risks (i.e. longevity risk) because it attaches probabilities to different outcomes. With the aid of, for example, the Lee-Carter stochastic approach and by means of frequency distributions and cumulated probabilities generated from 10,000 Monte-Carlo simulations of the Lee-Carter model of mortality (Antolin, 2007)¹⁶, the LRI can then be calculated as follows.

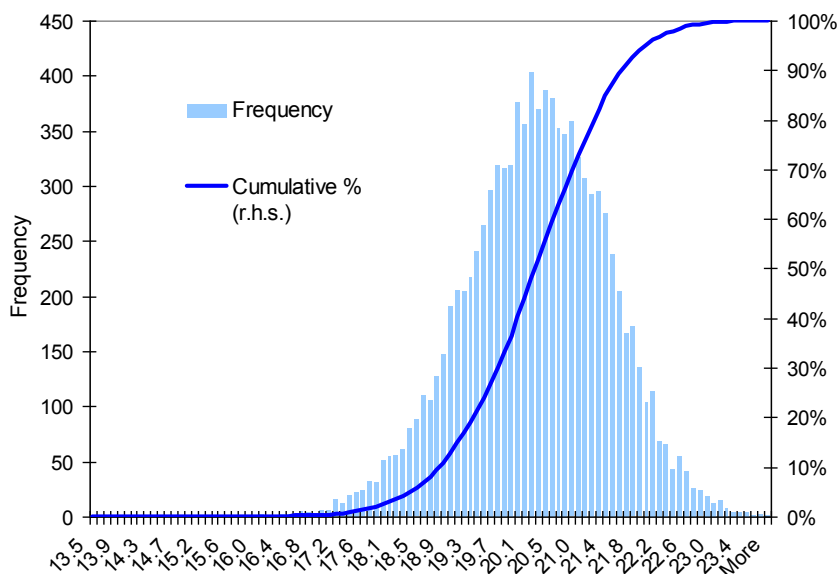
...such as the Lee-Carter approach

The Lee-Carter approach, or any other stochastic approach, would provide a central forecast for the life expectancy at a particular age, for example at age 65, and in a particular year, for example 2050. This central forecast is for example a life expectancy of 21 years when reaching age 65 (Figure 1). Moreover, because the approach is stochastic, it allows the generation of 10,000 Monte-Carlo simulations using random number generators for the random terms in the Lee-Carter equations. The result of such exercise is a frequency distribution and a cumulative probability for life expectancy at age 65 in 2050. The cumulative probability function in Figure 1 provides the probability or likelihood that life expectancy will be lower or equal than a pre-determined forecast value. For example, the central forecast of life expectancy of 21 years when reaching age 65 will occur in 73.1 cases out of 100. Moreover, Figure 1 also shows that the central forecast lies above the median life expectancy, that is, the likelihood that life expectancy will turn out higher than the central forecasts is lower than 50%. In particular, only in 26.9 out of 100 cases life expectancy will be higher than the central forecasts. In addition, the probability of any deviation regarding life expectancy is also easy to determine. For example, there is a 17.9% likelihood that life expectancy at age 65 in 2050 will be one year higher than the central forecast.¹⁷

Publicly generated information can then be used by annuity providers and pension funds to assess longevity risk

On the basis of this approach, governmental agencies can calculate a longevity risk index indicating the probability that life expectancy, for example at age 65, deviates by 1 year from the central forecast in 2050, $LRI(i, t, m) = (65, 2050, 1)$ for different subgroups of the population. Calculating this for all ages i , for all years t from 10 to 75 years after the latest available information, and for deviations m of 1 to 10 years, they could construct a matrix for different population subgroups. This information can then be used by annuity providers and pension funds to assess the longevity risk embedded in their membership structure.

Figure 1. Histogram: Life expectancy (LEx) at age 65 in 2050



Source: Antolin (2007).

VII. Conclusions

The possible role that governments can play in promoting capital market solutions for longevity risk transfer...

This paper has examined the role that governments can in principle play in promoting or encouraging capital market solutions for transferring the longevity risk of pension funds and annuity providers. Financial markets (including insurance) work efficiently for sharing individual risks and short-term risks between cohorts (with largely overlapping lifetimes) but not for the long-term life risks of older cohorts that are largely known when the younger cohorts arrive. Ex ante efficient intergenerational risk sharing via private markets is therefore not possible as future generations cannot be included. These considerations set the stage for the central public policy question what (capital market) role (if any) the government can play in overcoming these structural obstacles.

...is hampered by their own longevity risk exposure, thereby reducing the prospects for the development of a government longevity-indexed bonds market...

...but other steps such as supporting the production of a longevity index seem to be more promising

The paper argues that this public policy role is hampered by the fact that governments themselves are already exposed to significant longevity risk. This means that issuing longevity-indexed government bonds would further increase their existing exposure. On this basis, the paper concludes that the prospects for a successful, large scale market in longevity-indexed bonds seem not favourable at this stage.

However, the paper suggests that governments can take other steps such as producing a longevity index. Governments, through their national statistical institutes, can encourage or support the development of a private market in longevity hedging products by producing a reliable and widely accepted longevity index that can be used as a benchmark for pricing these products. Alternatively, they could make the data and information necessary to produce such an index widely available.

Notes

1. The self-insurance by individuals of longevity risk is generally speaking inefficient. It is therefore welfare improving to have retirement income annuitised at retirement as consumption will be maximised and the risk of outliving one's resources is removed (Yaari, 1965).
2. See Schroeder and Clark (2005); Richards and Jones (2004); and Morgan Stanley (2005).
3. This is likely to be a partial hedge as in practice significant basis risk – a portfolio of annuitants or members of pension plans or insurance schemes may exhibit a very different pattern of longevity improvements compared to the underlying index for a bond – will remain in portfolios or pension and insurance schemes. For example, Fernandes (2005) argues that basis risk could be of the order of 20%.
4. Research has identified a number of key obstacles that explain why a large scale private-sector driven market in longevity products is unlikely to develop in the near future (Blommestein, 2006).
5. This section has benefited from discussions at the OECD's Committee for Financial Markets.
6. The bond was priced by taking the projected survival rates produced by the UK Government Actuary's Department (GAD) and these were discounted at LIBOR minus 35 basis points to give the issue price. The risk associated with differences between experienced mortality and the GAD projections were passed to a reinsurance company, Partner Re, leaving the EIB with an after longevity swap with plain vanilla interest rate finance.
7. The issuance of the longevity-indexed bond required the arrangement of a derivative transaction as the EIB is not a natural seller of longevity protection. Therefore, longevity risk would have been transferred to a re-insurer. If it is possible to structure a derivative in that way, it is clear that the longevity risk could be transferred through a swap without having to issue a longevity bond. Naturally the situation would be different if the bond issuer was a natural holder of long longevity positions.
8. Brown and Orszag (2006) note that via these general equilibrium effects, future generations would already share (partially) in longevity risk.

9. Although (future) politicians can always break these contracts. Pension reform is to a large degree synonymous with breaking inter-generational contracts. Hopefully, however, these reforms would result in moving away from the existing non-optimal degree of inter-general risk-sharing.
10. See Table 3.12 and associated explanations in the EC (2006) report.
11. The choice of age 80+ as a threshold is based on practical considerations. The average life expectancy at birth or at age 65 is just below age 80. It would have been better to use the exact average life expectancy as a threshold, but unfortunately the breakdown available is between people aged 65-79 and people aged 80+ , which, nevertheless, it is quite close to the threshold determined by the average life expectancy.
12. According to table 2, the total projected increase in pension expenditure is 2.3 percentage points for the EU15. This increase is the result of 8.2 percentage points increase due to the pure demographics effect or ageing and to 1.0, 1.7, and 2.8 percentage points decrease due to projected improvements in employment ratios, reductions in the share of pensioners and the average pension relative to GDP per worker, respectively.
13. The underlying assumptions for calculating the impact of ageing on public expenditures reported in the EC report and Table 2 (first three columns) include an average increase in life expectancy of 1.1 years per decade.
14. The EC projections fail to assess the uncertainty surrounding future increases in life expectancy. Life expectancy may increase 1.1 years per decade as implicitly assumed in the EC projections, 2.2 years per decade or another number. Unfortunately, since the EC exercise follows a deterministic approach instead of a stochastic approach, it is not possible to attach likelihoods to increases in life expectancy and pension expenditures.
15. Allowing individuals to buy annuities at retirement is welfare improving, because in this way consumption will be maximised and the risk of outliving one's resources will be removed (Yaari, 1965).
16. Monte-Carlo is a technique that involves using random numbers. In particular, it produces simulations of the Lee-Carter model by generating random number for the random terms in the Lee-Carter equations (1) and (2). The Stata programmes, available upon request, assume that the mean and the variance of $\varepsilon(x,t)$ and $e(t)$ are those obtained from the errors of fitting the Lee-Carter model to the historical data.
17. $\Pr(LEx \leq LExc+1) - \Pr(LEx \leq LExc) = 0.91 - 0.73 = 0.17$, where $LExc$ is the central forecast.

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Retail Instruments in Public Funding Strategies

Hans Blommestein and Greg Horman

Retail borrowing programmes are one component of government debt issuance in both OECD and non-OECD countries.

These programmes take a variety of forms and often exist to satisfy a number of objectives. In some jurisdictions, they play a significant funding role. Even in countries where retail borrowing programmes play a small role, they are in many cases politically important because they satisfy primarily social objectives.

In recent years, some OECD countries have begun to reconsider their retail borrowing programmes. Shrinking borrowing requirements in a number of countries have led to priority being put on maintaining liquid wholesale markets. Other countries continue to see benefits from their retail borrowing programmes and use them as a significant and stable source of funding. These governments are often innovative at finding ways to drive down administration costs, such as through the use of new electronic distribution channels and total dematerialisation of securities.

Retail Instruments in Public Funding Strategies

Hans Blommestein and Greg Horman*

I. Introduction and overview

Retail borrowing programmes...

Retail borrowing programmes are one component of government debt issuance in both OECD and non-OECD countries.

...take a variety of forms and satisfy a number of objectives

These programmes take a variety of forms and often exist to satisfy a number of objectives. In some jurisdictions, they play a significant funding role. Even in countries where retail borrowing programmes play a small role, they are in many cases politically important because they satisfy primarily social objectives.

Countries have begun to reconsider their retail borrowing programmes

In recent years, some OECD countries have begun to reconsider their retail borrowing programmes, whereas other countries continue to see benefits from these programmes and use them as a significant source of funding. These reviews are in part driven by shrinking borrowing requirements and the availability of new distribution technologies.

*

The authors are from the Financial Affairs Division of the OECD Directorate for Financial and Enterprise Affairs, where Hans Blommestein is Head of the OECD Public Debt Management and Emerging Financial Markets programmes and Greg Horman is Consultant. They are indebted to Delegates to the OECD Working Party on Debt Management for providing data for this article. The opinions expressed and arguments employed in this article do not necessarily reflect the official views of the OECD or of the governments of its member countries.

OECD provides a platform to discuss policy perspectives

This article discusses recent policy perspectives by the OECD Working Party on Debt Management¹ on the role of retail borrowing programmes, based on its leading practices concerning cost-effectiveness and risk.² It also benefited from recent discussions at the Sixteenth Annual OECD Global Forum on Debt Management and Emerging Government Securities Markets, held in Amsterdam in December 2006.

This article proceeds as follows. Section II describes the design of retail borrowing programmes currently in use, and Section III discusses the objectives behind these programmes. Section IV highlights current trends with retail borrowing programmes, complemented with country examples and statistics recently compiled by the OECD. Section V presents policy conclusions.

II. Design of retail borrowing programmes

Retail borrowing programmes are one component of government debt issuance in both OECD and non-OECD countries. These programmes typically take two forms (Table 1).

Retail issuance may be represented by a mechanism...

In the first form, the retail borrowing programme is represented by a *mechanism* for enabling retail investors to access the wholesale product easily. In the primary market, this often involves enabling individuals to participate directly in auctions on a non-competitive basis, with small-sized subscriptions. In the secondary market, it may involve registration rules that allow wholesale securities to be split into smaller parcels.

...or by a distinct product

In the second form, the retail borrowing programme is represented by a *retail product* that is distinct from the government's wholesale product and specifically designed for retail investors, so as to be easy to understand and access. These types of retail securities, often called savings bonds, are designed to ensure capital protection and are typically non-marketable, although they may offer provisions for redemption before maturity. In addition, a few governments issue retail securities with unconventional cash flows, such as lottery bonds, where interest payments are distributed through a lottery mechanism.

The retail borrowing programmes in some countries incorporate both forms.

Table 1. Government debt instruments available to retail investors in selected OECD countries

Country	Marketable standardised securities	Non-marketable savings bonds	Non-marketable lottery bonds
Belgium		✓	
Canada		✓	
Germany	✓	✓	
Ireland	✓	✓	✓
Italy	✓	✓	
Japan		✓	
Sweden	✓	✓	✓
United Kingdom	✓	✓	✓
United States	✓	✓	

Source: Country authorities.

III. Objectives of retail borrowing programmes

Governments have multiple objectives for their retail borrowing programmes

Governments often have multiple objectives for their retail borrowing programmes (Table 2). One objective is to raise funds in a low-cost manner, subject to a prudent degree of risk, and to diversify the sources of funding, especially when borrowing requirements are high or unstable. In this regard, the objective is no different from that for wholesale securities. Retail investors may form a reliable and relatively cost-indifferent funding source, providing a buffer to accommodate unexpected increases in the borrowing requirement or shifts in institutional investor appetite.

Issuance targeted at retail investors may also serve the objective of developing the domestic financial market by fostering innovation and encouraging competition for retail savings.

In many cases, however, the primary rationale behind a retail borrowing programme is to satisfy social objectives, such as fostering a culture of savings and providing a secure investment for investors with a low tolerance for, or a low capacity to manage, risk. Retail instruments with unconventional cash flows may be difficult to reconcile with social objectives such as these.

Table 2. Objectives of retail borrowing programmes in selected OECD countries

Country	Objective
Belgium	Diversify the investment instruments offered to retail investors Promote retail investor participation in the bond market
Canada	Raise stable, low-cost funding for the government
Ireland	Provide investors with alternative savings products
Italy	Provide an alternative investment choice to retail investors
Japan	Reduce the overall cost of government borrowing Diversify the investor base Promote retail participation in the bond market
Sweden	Borrow at the lowest possible cost, taking into account risk Offer individuals secure and diverse investments with low fees Contribute to fair competition in the financial markets
United Kingdom	Minimise financing costs over the long term, subject to risk Diversify the investment instruments offered to investors Provide a totally secure instrument for people to invest in Provide the government with an additional source of funding
United States	Borrow at the lowest possible cost, recognising the constraints

Source: Country authorities.

IV. Current trends with retail borrowing programmes

Shrinking borrowing requirements put priority on wholesale issuance

Some countries have begun to reconsider their retail borrowing programmes. Shrinking borrowing requirements in some countries (*e.g.*, Canada, Denmark, New Zealand, and some small euro-zone countries) have led to priority being put on maintaining liquid wholesale markets. In this environment, retail borrowing programmes, especially non-

standardised products, can fragment the market, reduce liquidity, and consequently raise the cost of funding.

Retail borrowing programmes may not be cost-effective...

The cost-effectiveness of retail instruments as a funding source is also being scrutinised, especially the all-in cost inclusive of administration. Small-denomination retail instruments tend to be more expensive to distribute and manage than standardised securities held by wholesale investors.

...and give rise to risks that need to be managed

Like other forms of debt, retail instruments expose the government to risks that need to be managed. In many countries, retail instruments are issued on demand and tend to have shorter tenors. This can be inconvenient for cash flow management and put pressure on the maturity profile. Likewise, it may complicate achieving interest rate benchmarks, such as duration or the average term to refixing.

Social objectives may no longer apply

In many cases, too, there is the judgment that the original social objectives behind retail borrowing programmes have been achieved or can be achieved satisfactorily through other interventions. For example, markets may now be sufficiently developed to deliver financial investment solutions to small savers, or the regulatory framework ensures adequate investor protection.

Some countries see ongoing benefits from their retail borrowing programmes

Other countries, however, continue to see benefits from their retail borrowing programmes and, indeed, rely on them as a significant source of funding. In the OECD area, those countries include Ireland, Portugal, Sweden, and the United Kingdom. The social objectives may still remain, but the instruments are priced to take account of the higher administration costs compared to wholesale borrowing. These governments are often innovative at finding ways to drive down administration costs, such as through electronic distribution and total dematerialisation of the securities.

Ireland, the United Kingdom, and Sweden

Ireland and the United Kingdom see a role for retail borrowing programmes in facilitating direct access to government savings products for low-income citizens and pensioners. The Swedish authorities have argued that retail borrowing programmes contribute to fair competition, especially if the banking sector is oligopolistic.

Australia

In Australia, the government does not issue any retail instruments, nor is retail access to the wholesale product encouraged. In particular, retail investors may not participate in auctions. The Reserve Bank of Australia, however, operates a facility whereby retail investors can buy and sell retail-sized parcels of bonds that the central bank holds in its own portfolio. This facility is not widely advertised or utilised.

The Australian government did issue retail instruments in the past. Its experience with the instruments was that they were not cost-effective compared to wholesale instruments after taking into account all costs, in particular the administration cost of running a retail borrowing programme. When the government's budget moved into surplus in 1987, this was taken as an opportunity to cease issuance of retail instruments.

Italy

In Italy, retail instruments currently play only a marginal role in the overall issuance programme, although their role was more important in the past. In the late 1980s and early 1990s, emphasis was put on developing the wholesale market and, at the same time, investors started to invest in other assets. Today, retail investors can easily access standardised wholesale securities in auctions or buy them in the secondary market.

According to the Italian authorities, it is difficult to obtain significant cost savings for the government through retail borrowing, although they have observed that the existence of retail instruments can encourage the banking system to be more efficient and competitive by delivering its own retail investment solutions to small savers. The current retail product in Italy is represented by non-marketable postal bonds. They are issued on demand, without limit, which in the past has posed problems for cash flow management. Importantly, all postal bonds issued since 2003 are not considered public debt, since the issuer was transformed into a private company. Postal bonds issued before that date, however, were transferred to the treasury and are public debt until they mature.

New Zealand

New Zealand maintains a long-standing retail programme primarily to satisfy social objectives. There is no bank deposit insurance scheme in New Zealand, so the retail bonds provide a financial product free of credit risk, if commensurately low-yielding, for very conservative investors. There is no mechanism for retail investors to participate in wholesale auctions, although securities can be split into smaller parcels in the secondary market. The volume of outstandings of the retail product has been declining, and the authorities have made incremental improvements to the product design and administration arrangements to make the programme more cost-efficient.

Switzerland

Switzerland does not have a retail borrowing programme. Retail investors are able to participate in auctions or make secondary market purchases through the banking system. As a service to retail investors, the government has maintained a small parcel size of CHF 1 000 for its bonds.

Israel

Perhaps unique among countries, Israel³ maintains both domestic and foreign retail borrowing programmes. Israel has carefully considered the pros and cons of retail issuance from its perspective as an issuer. The disadvantages include costly and complicated administration, market fragmentation, competition with the private sector, and the negative effects of non-marketability of the product. Importantly, retail borrowing is contrary to wholesale trends. Nor is the case for retail instruments as a low-cost source of funding compelling, although Israel's foreign retail product does provide a mechanism for tapping into the diaspora. Its experience with retail instruments and accounts does not encourage setting up new retail borrowing programmes. There is sufficient justification for maintaining existing programmes, however, provided that they are streamlined.

South Africa

As another example outside the OECD area, South Africa started its retail borrowing programme to serve mainly social objectives, but the authorities also wanted to encourage development of the small-savings market. The introduction of the retail product positively affected the pricing of bank deposits and led to the elimination of many fees. Now the financial industry bases its deposit rates on government bonds.

***Cross-country data
show a diverse picture
for retail instruments***

The OECD recently compiled data on the size of retail borrowing programmes in member countries (Table 3). The data illustrate how in some countries retail instruments are an important component of outstanding debt, whereas in others their contribution is minor.

**Table 3. Retail debt as a percentage of total government debt
in selected OECD countries**

Country	2002	2003	2004	2005	2006
Australia	0.0	0.0	0.0	0.0	0.0
Austria	0.1	0.1	0.1	0.1	0.2
Canada	5.4	5.2	4.9	4.4	4.1
Denmark	0.0	0.0	0.0	0.0	0.0
Finland	0.9	0.6	0.5	0.3	0.3
Germany	2.5	1.7	1.4	1.4	1.4
Greece	...	1.5	0.7	0.3	0.2
Hungary	6.1	5.0	5.4	4.6	4.5
Ireland	14.5	14.5	15.4	16.3	17.9
Italy	26.6	20.7	21.4	16.7	...
Japan	2.4	2.4	0.3	3.9	...
New Zealand	1.8	2.3	1.8	1.7	...
Norway	0.0	0.0	0.0	0.0	0.0
Portugal	19.6	19.0	17.5	16.0	15.9
Spain	5.0	3.9	3.4	3.2	3.5
Sweden	4.9	4.8	4.8	4.9	5.1
Switzerland	0.0	0.0	0.0	0.0	0.0
Turkey	...	15.9	14.2	11.2	9.2
United Kingdom	17.8	17.0	16.4	15.4	14.6
United States	3.0	2.9	2.7	2.5	2.3

Note: “...” denotes unavailable data.

Source: OECD secretariat calculations based on data from country authorities.

As with other statistics on central government debt, this exercise involves some methodological complexity.⁴ This is particularly the case when the retail borrowing programme takes the form of a retail distribution mechanism, as opposed to a specialised retail product. Likewise, in some cases, countries cannot easily distinguish between holdings by retail investors that are directly attributable to a retail borrowing programme and those that arise when retail investors acquire securities in the secondary market through normal mechanisms.

V. Policy conclusions

Policy conclusions on the role of retail instruments in public funding strategies include the following.

Be clear about the objectives for the retail borrowing programme

Retail instruments can, and do, play a role in government debt management. It is important, however, to be clear about the objectives behind having a retail borrowing programme. The first-best situation is that an objective has been identified and a retail borrowing programme is made available as a means to satisfy that objective. This is in contrast to devising a justification *ex post* for a programme that already exists. In many countries, however, these programmes are long-standing and a legacy of past policy decisions.

Ensure that the programme is efficient

The second requirement is to ensure that the retail borrowing programme is efficient. Depending on country circumstances and the underlying objective, this may support having an instrument with a special design. Alternatively, some modifications in the distribution of wholesale securities may suffice. In some cases, the government may not need to develop a retail product or retail distribution mechanism if it can apply suasion or regulation to encourage the private sector to develop retail savings products based on, or in the form of repackaged versions of, government securities. There may be ways to reduce cost, such as by providing direct access to the primary market (*e.g.*, through the Internet) or to reach the non-banked population through institutions with near-universal penetration (*e.g.*, the post office or utilities).

Have fair and efficient pricing that recovers all administration costs

The third requirement is have fair and efficient pricing that recovers all administration costs. If the retail instrument contains a subsidy element, the cost should be transparent and explicitly borne by some part of government. Pricing should be consistent with the government's wholesale securities and the rest of the market. For instance, the retail product is likely to carry a lower yield than the wholesale product, on account of its higher administration cost and smaller parcel sizes, and a lower yield than bank deposits, reflecting the (relative) absence of credit risk.

Incorporate retail borrowing into the debt strategy

The fourth requirement is to ensure that retail borrowing is incorporated into the debt strategy. This means being explicit about its intended volume and role in reducing the cost of borrowing, diversifying the investor base, developing the wider fixed-income market, and achieving social policy objectives. The likely trend of retail borrowing should also be discussed.

Adopt appropriate sequencing of market development

The fifth requirement is to adopt appropriate sequencing. Particularly for emerging market countries that do not currently have retail borrowing programmes, this involves deciding at which stage to introduce a retail product or retail distribution mechanism and determining the priority for developing the retail market *vis-à-vis* the wholesale market. Consideration should be given to how the retail and wholesale markets will interact.

Ensure neutrality with the private sector

The sixth requirement is to ensure neutrality with the private sector where appropriate, as the lack of neutrality may impede the private sector development that the government wants to achieve. A consideration here is to what extent the government, as regulator, imposes on itself, as an issuer of a retail savings product, the same rules and requirements that it imposes on other issuers in terms of investor protection, disclosure, and so on.

Notes

1. The OECD Working Party on Debt Management is a policy forum for senior government debt managers. Over the years, the working party has amassed a unique, authoritative, and up-to-date pool of knowledge in this field of government activity and policy, including leading practices, techniques, strategies, operations, and statistics.
2. These OECD leading practices serve as global standards in this highly specialised area of government financial management. In addition to discussions among OECD member countries, the OECD Working Party on Debt Management has as an objective to create awareness among non-member countries of the major policy issues in developing sound debt management policies and to share and learn from country case studies and OECD best practices. In this way, debt managers from emerging markets become better acquainted with OECD policies, techniques, and experiences in the field of public debt management and government securities markets. Debt managers from an increasing number of emerging market jurisdictions face challenges similar to those of their counterparts from advanced markets due to competitive pressures from global finance.
3. While not a member of the OECD, Israel is an observer to the OECD Working Party on Debt Management.
4. OECD *Central Government Debt Statistical Yearbook* provides authoritative and comprehensive information on central government debt.

Housing Markets and Household Debt: Short-term and long-term risks

Sebastian Schich and Jung-Hyun Ahn

The short-term effects of cooling housing markets on consumption and financial institutions' profitability and capital have so far not been as bad as had been feared by many observers. There are vulnerabilities of specific groups of households, but the sector as a whole does not seem to be exposed to large risks. As a result, broader financial stability risks arising from the current situation appear to be limited, at least over the short term. Nonetheless, the situation in household balance sheets bears monitoring and the potential for problems to emerge in the longer term should not be overlooked. Households may take on too much debt, as they may not only overestimate their subsequent income growth, but also underestimate the long-term risks that they face, including those related to their retirement income financing.

Housing Markets and Household Debt: Short-term and long-term risks

Sebastian Schich and Jung-Hyun Ahn*

I. Introduction

***Household debt has
risen in many OECD
countries...***

High levels of household indebtedness have been considered one source of risk for households' balance sheets and financial stability for some time now. Household debt has risen in many OECD countries, although there is great variation among them in terms of the levels and compositions of debt, the distribution of associated risks within the financial system and between the latter and the household sector.

***...mirrored by growth
in real estate asset
value per household***

On the positive side, much of this build-up in debt is mirrored by increases in the value of household assets, so that households' net wealth positions on aggregate look strong. In particular, households in many countries have capitalised on high and rising house prices, which along with relatively low financing rates have enabled them to tap the equity accumulated in their homes to sustain consumption, even when growth in personal income has been relatively flat or moderate. More recently, however, the boost to consumption from mortgage equity withdrawal

* The present note was written by Sebastian Schich, Principal Economist in the *Financial Affairs Division*, with contributions from Jung-Hyun Ahn, summer intern in that Division. It is based on the background documentation prepared for the discussions under the *Tour d'Horizon on Financial Markets* at the November 2006 meeting of the *Committee on Financial Markets* (CMF) and it takes into account these discussions and comments made by Delegates. It also includes comments on a revised version that was circulated in December 2006.

in some countries has subsided as residential housing markets have cooled.

Only some parts of the household sector appear to be vulnerable to cooling housing markets, so that financial stability risks are limited at least over the short term

The short-term effects of cooling housing markets on consumption and financial institutions' profitability and capital have so far not been as bad as had been feared by many observers. In part, this relatively favourable development owes to oil prices that have declined from their previous peaks, strong equity markets, broadly strong labour markets and, perhaps, confidence effects. Vulnerabilities of the household sector seem to be largely confined to specific groups, so that broader financial stability risks arising from the current situation appear to be limited, at least not over the short term.

Potential long-term mortgage-related market risks could cause problems, if overlooked

Nevertheless, the situation in household balance sheets bears monitoring and the potential for problems to emerge in the longer term should not be overlooked. Households may take on too much debt, as they may not only overestimate their subsequent income growth, but also underestimate the long-term risks that they face, including in particular those related to their retirement income financing. To the extent that households perceive that short-term mortgage-related market risks are rather limited, they may erroneously project current benign conditions into the future and underestimate the longer term market risks that they face. As a result, households may choose consumption and investment patterns that may not be sustainable over the long term.

II. Selected developments in household balance sheets

Developments in household asset compositions

Developments on the asset sides of household balance sheet need to be taken into account when looking at mortgage debt developments

It is important to make a broad assessment of household balance sheet developments, focusing not just on mortgage debt and other liabilities, but also on developments on the asset side. In the context of the latter, one of the striking developments has been the recent increase in the share of real estate holdings in total household assets. Notwithstanding differences in the extent of change across countries, the share of real estate as compared to financial and other assets has been increasing since the late 1990s in

all G7 countries except Japan and Germany (Figure 1). In particular, in France, the United States, and the United Kingdom, the share of real estate has increased steeply (of which France and the United Kingdom experienced increases by more than 10%) and reached historical highs. It now accounts for a major share of total household assets in France, Germany, Italy, and the United Kingdom (Figure 2).

As real estate takes a greater proportion of total household assets, volatility in net wealth declines

As households appear to increasingly regard their real estate assets as long-term savings vehicles, and with real estate having come a major part of total assets, there is the potential for house price fluctuations to affect the volatility of savings for retirement financing. Thus far, however, real estate appears to have had a dampening effect on the overall volatility in household balance sheets. Table 1 shows that the volatility of all market-sensitive assets (which are approximated by total financial assets minus savings and demand deposits) is lower if real estate assets are included than otherwise.

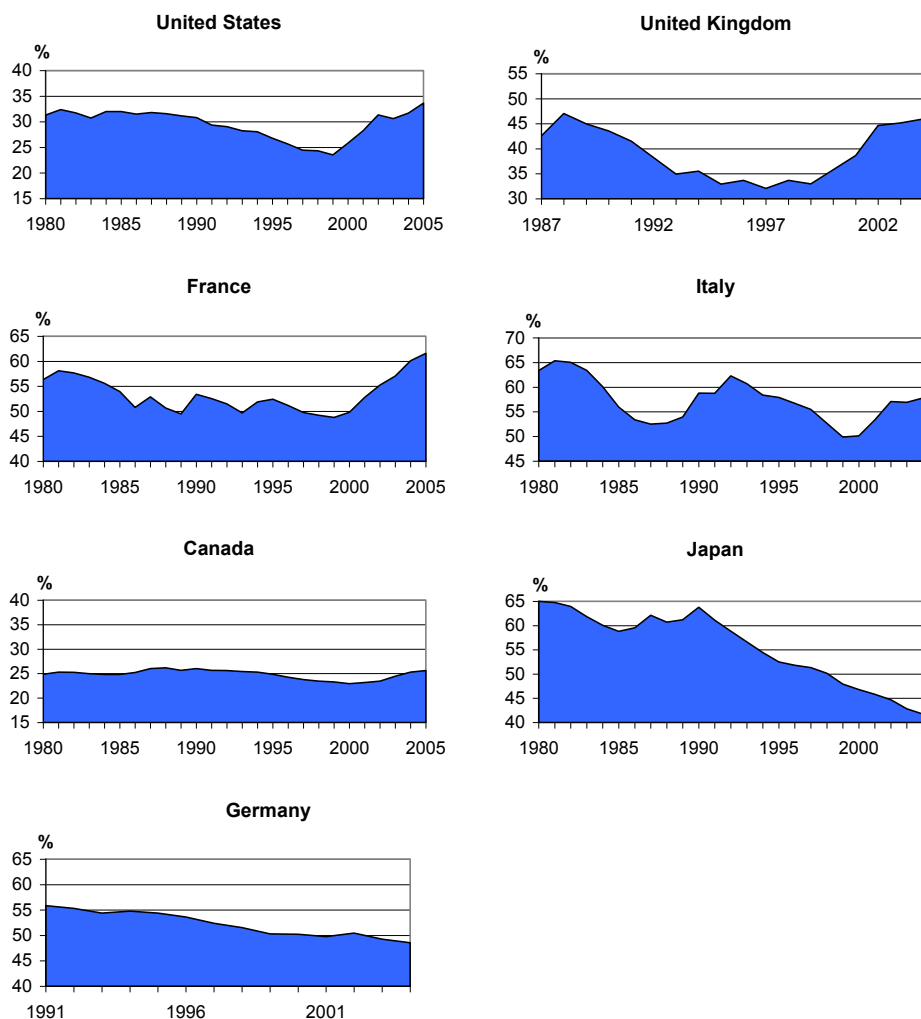
This observation applies equally if volatility is either measured in terms of levels or changes of the value of market sensitive assets relative to disposable income. Thus, as real estate has come to represent a growing share of total household assets, the volatility of household net wealth may have declined over time. In fact, looking at simple standard deviations of changes in net wealth as of nominal disposable income over two different sample periods, the empirical evidence is consistent with this hypothesis for most G7 countries (Table 1).

This pattern may not last

This effect has mainly reflected the fact that real estate assets have exhibited lower price volatility over the period examined than financial assets such as equity. Moreover, real estate and financial asset prices have tended to be negatively correlated. It is not clear, however, whether this pattern will continue to hold going forward. Indeed, most recent data show that the (negative) correlation between real estate and some financial assets such as equities may have diminished somewhat. One must also acknowledge that there are risks associated with real estate assets, including the fact that they are typically relatively illiquid and non-diversifiable from regional and local price fluctuations. In addition, these assets are typically highly leveraged.

Figure 1. Real estates share by households

In per cent of total household assets

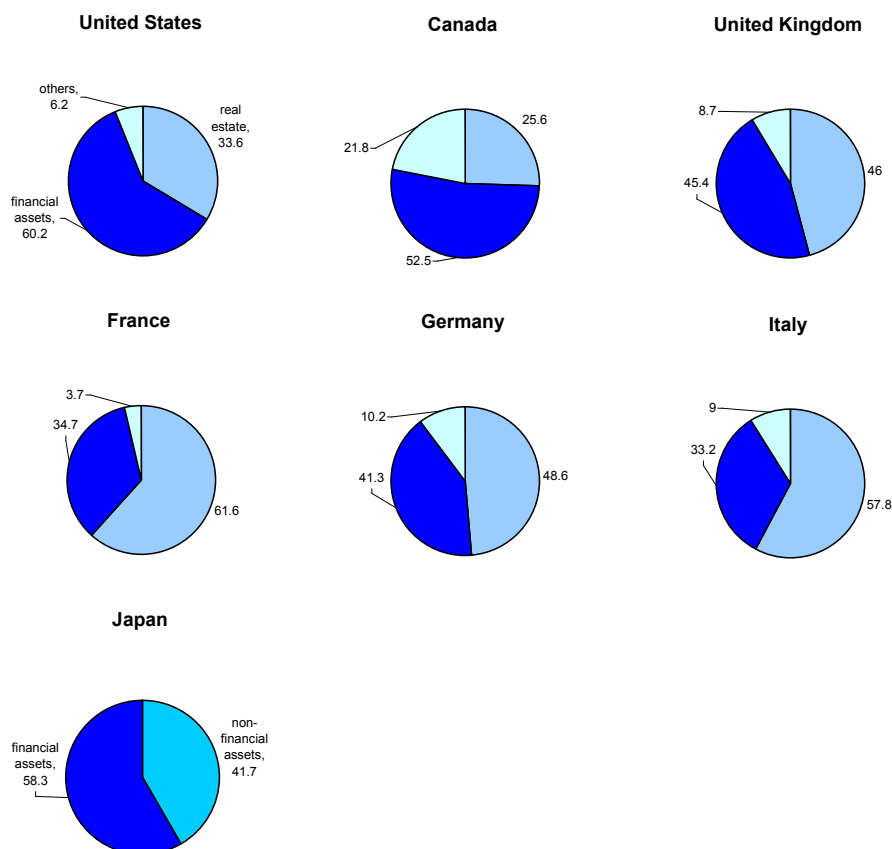


Note: Only residential estates are included in real estates for the UK and Canada. Real estate for Japan is approximated by non-financial assets. Period between 1980 and 2004 or 2005, except for the UK (1987-2004) and for Germany (1991-2004).

Sources: U.S. Board of Governors of the Federal Reserve System; INSEE; OECD; Secretariat calculations.

Figure 2. Composition of household asset portfolios

Share of total assets in per cent



Notes: Data from 2005 for the US, France, Canada and from 2004 for the other countries. Only residential estates are included in real estates for the UK and Canada.

Sources: U.S. Board of Governors of the Federal Reserve System; INSEE; OECD; Secretariat calculations.

Table 1. Household balance sheets volatility measures

In per cent						
Net wealth / disposable income	Market sensitive assets / disposable income (in ratios)		Net wealth / disposable income	Market sensitive assets / disposable income (changes in ratios)		
	without real estate	including real estate		without real estate	including real estate	
United States	9.92	21.07	14.81	4.58 **	7.14 **	4.94 **
Japan	14.03	25.26	16.23	6.10 **	8.67 **	6.82 **
Germany	4.24	18.48	6.24	1.52 **	4.46 *	1.88
France	15.31	33.10	21.06	5.17 **	15.16 **	6.08 **
Italy	22.19	47.34	26.52	5.22 **	10.17 **	6.57 **
United Kingdom	11.03	18.92	12.30	6.95 **	10.20 **	7.10 **
Canada	10.60	20.20	15.57	2.23 **	3.82 **	2.64 **

Notes: Market sensitive assets are calculated as total financial assets minus deposits. Each measure is calculated as a ratio to disposable income. *Volatilities of the ratios* are calculated as standard deviation divided by the mean for the period. (See also IMF, Global Financial Stability Report, April 2005, Table 3.1). In addition, *volatilities of the changes in the ratios* are calculated in a comparable way. Data is annual from 1980 to 2005 (1991 to 2004 for Germany and 1987 to 2004 for the United Kingdom). In the case of Japan, real estate assets are approximated by non-financial assets. * and ** denote stationarity at the 5% and 10% level of significance, respectively.

Sources: National statistical accounts and OECD Secretariat calculations.

Increases in household mortgage indebtedness

Developments in the aggregate

Household financial obligation ratios have been relatively stable so far

In recent years, rising house prices have been supported by rising household incomes and low interest rates, but interest rates may rise from current moderate levels. Rising interest rates tend to increase debt service payments, and such a development could precipitate rising household financial distress, especially where a significant part of mortgage debt is at variable rates or on short re-pricing schedules.¹ The ratio of mortgage debt service to household disposable income has risen over the past few years in several countries. In some of them, the rise in mortgage debt has been offset by reductions in other forms of debt, however. As a result, financial obligations ratios of households (that are homeowners) seem not to present

much cause for concern in most countries, as these ratios have, on average, been relatively stable.

Mortgage loan maturities can extend to 60 years

Moreover, the substitution from consumer to mortgage debt that has taken place in many cases has not only allowed households to run lower debt service ratios than otherwise, but it has also implied a lengthening of maturities, which in the case of fixed-rate loans tends to reduce their exposure to interest rate risk. Within the category of mortgage loans, there has also been a lengthening of mortgage loan maturities in several countries. For example, in Spain, the average length of new mortgage loans has risen from around 10 years a decade ago to 26 years currently. In Belgium, some recent mortgages had maturities of 35 years or more (although 20 years remained the dominant maturity). In Portugal and Finland, mortgage loan maturities can now even extend to 50 and 60 years, respectively.

Developments across different income categories

Some households are more vulnerable to housing market fluctuations and interest rate hikes than others...

Observations based on aggregate data may not always be the most relevant, however. Ultimately, the impact of any deterioration in household sector income also depends on the distribution of debt across different income categories. In many constituencies the bulk of household sector debt is backed by solid income positions. Nonetheless, in some mortgage markets the participation of highly-leveraged and relatively lower-income households may also be on the rise, although detailed data on debt by income groups was available to us only for a small number of countries. For example, in the United States, the Federal Reserve's tri-annual Survey of Consumer Finances shows that lending to the households in the lowest income quintile rose, but only slightly from about 14% in 2001 to about 16% in 2004 (Table 2). In Portugal, while ratios of debt over income can be relatively high for some middle-income households, they are generally low for less wealthy households (Table 3). Nonetheless, some households, especially younger households with lower incomes, are considered to be somewhat more vulnerable to adverse interest rate or house price developments than other households. In several other countries, there appears to be

very limited evidence that the volume of mortgage debt owed by lower-income households has increased, although in some of them data availability does not allow one to draw firm conclusions. For example, in Italy, the share of mortgage debt held by lower income households and the share of these households' mortgage payments to disposable income have even declined slightly, the same as for the other households. Similarly, the incidence of extreme housing cost burdens among the lowest-income quintile has decreased in Australia (Table 4). For further related evidence, see Girouard *et al.* (2007).²

Table 2. United States: Family holdings of debt, by selected characteristics of families, 1989-2004 surveys

Percentage of indicated families with any debt secured by primary residence

Survey Year	1989	1992	1995	1998	2001	2004
All families	39.46	39.13	40.98	43.10	44.64	47.89
<i><u>Percentiles of income</u></i>						
Less than 20	7.54	10.32	10.56	11.01	13.81	15.72
20-39.9	23.31	22.01	26.04	24.11	26.75	29.97
40-59.9	37.89	35.34	37.65	43.75	44.37	51.53
60-79.9	56.29	56.46	59.26	63.36	62.10	65.61
80-89.9	70.39	68.18	69.83	73.52	76.86	76.96
90-100	74.11	74.78	72.93	73.03	75.40	76.26

Source: Response to the OECD Committee on Financial Markets' Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006; see also <http://www.federalreserve.gov/pubs/oss/oss2/2004/bulletin.tables.pub.nominal.xls>.

...although most new mortgage market participants are middle-income rather than lower income households

Summarising, it appears that while mortgage lenders in most OECD countries have extended finance to a wider range of households, most of the new market participants are middle-income rather than lower income households. This finding suggests that a large part of the debt is held by wealthier households who spend a smaller proportion of their disposable income on their debt servicing. It also suggests that debt has increased steeply in recent years whereas we have experienced steeper increases in net wealth thanks to higher house prices and stock market recovery following the 2000 crash, which may have dampen some possible negative effect of increasing debt.

Table 3. Portugal: Household debt by classes of total wealth

Income groups		Per cent of households with debt in respective group	Average debt-over-income ratio in respective group ^a	Average debt-over-income ratio of the lowest 25% income quintile in respective group ^a
Low income quintile	Income group 1	16.2	1.73	7.86
	Income group 2	21.3	2.67	6.92
	Income group 3	21.4	5.32	12.82
	Income group 4	25.5	5.47	14.99
Middle income quintile	Income group 5	28.3	14.34	30.82
	Income group 6	36.3	13.36	25.18
	Income group 7	37.6	9.59	20.54
	Income group 8	40.0	10.52	27.14
High income Quintile	Income group 9	42.4	7.15	17.17
	Income group 10	34.1	5.70	16.16

^a Debt over monthly income.

Notes: For example, households included in “Income group 1” are in the sample 10% less wealthy and those in “Income group 10” are in the 10% most wealthy group of households. Data from Portuguese Household Wealth and Indebtedness Survey of 2000.

Source: Response to the OECD Committee on Financial Markets’ Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006.

Table 4. Australia: Housing Cost Burden by Income Quintile

Income Quintile	Burden 30-50% of gross income		Burden 50% or more of gross income	
	(per cent of number of households)			
	2002/03	2003/04	2002/03	2003/04
1	14.2	14.6	19.7	14.7
2	14.3	12.6	3.4	3.2
3	9.6	9.8	1.0	1.9
4	5.6	8.7	0.6	1.8
5	4	6.2	0.5	1.2
Total	9.7	10.6	5.8	5.1

Source: Response to the OECD Committee on Financial Markets' Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006; based on *Survey of Housing Occupancy and Costs* 2003/04, ABS Cat No. 4130.55.001).

The role of new mortgage products

Heightened competition between lenders resulted in products which facilitate wider participation in the mortgage market

Wider participation of households has been facilitated by product innovation, which in turn has been spurred by heightened competition among mortgage loan providers. Many mortgage products, especially non-traditional ones, which historically have been used mainly or exclusively by higher-income borrowers, are now offered to a much wider spectrum of borrowers. The new mortgage products that are increasingly becoming available offer various advantages, including lower initial borrowing costs and a wider range of choices for prospective homebuyers. The contractual features of some of these new products are such that it is easier for households to overcome liquidity constraints. For example, "interest-only" loans, which are now widely available in many OECD countries (Table 5), or "amortisation-free" mortgage loans allow the deferral of the payment of the principal for a given period or even until the end of the loan.

Table 5. Availability of interest-only mortgages

Australia	widely available
Belgium	widely available ^a
Canada	limited availability ^a
Denmark	widely available
Finland	not widely used
France	widely available ^a
Germany	widely available ^a
Greece	not widely used
Hungary	limited availability ^a
Ireland	widely available ^a
Italy	widely available ^a
Netherlands	widely available
Portugal	widely available ^a
Slovak Republic	not available
Spain	not common ^b
Sweden	widely available ^a
Turkey	not available
United Kingdom	widely available ^a
United States	widely available

Notes:

(a) Countries for which assessments were made by London Economics (2005). These assessments were included in the questionnaire that was circulated.

(b) In Spain, interest-only loans are not common. Some products allow to defer the repayment of a significant part of the loan to the final payment and others allow some initial principal payment exclusion periods. The share of such products is low, however.

Source: Responses to the OECD Committee on Financial Markets' Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006; and London Economics (2005), *The Costs and Benefits of Integration of EU Mortgage Markets*, Report for the European Commission GDG-Internal Markets and Services. August 2005.

Clearly, by itself, the added flexibility that many new mortgage products provide is helpful as it facilitates participation of a wider set of households in the mortgage market and enables households to match payments more closely to their income flows. But it also allows the need for both banks and households to monitor the consistency between payment obligations and income flows to seem less pressing, as debt-service problems may be less readily apparent, which in turn may lead to complacency, with risks being underestimated.

III. Long-term risks faced by households

Under-estimating long-term risks can lead to over-borrowing

Households may take on too much debt, as they may not only overestimate their subsequent income growth, but also underestimate the long-term risks that they face. To the extent that households perceive that short-term mortgage-related market risks are rather limited, they may erroneously extrapolate this observation and underestimate the longer term market risks that they are facing. As a result, households may choose consumption and investment patterns that may not be sustainable over the medium to long-term.

In this context, household mortgage-related risk exposure needs to be seen against the background of a trend shift in the exposure of households to a variety of risks, especially those related to pensions, where households have become more directly exposed to financial and longevity risks. The long-term implications of the new risk profiles are still untested. Indeed, many of the changes in products, pricing and risk profiles have occurred against a backdrop of very favourable macroeconomic and financial markets conditions and are yet to be tested in a more difficult environment.

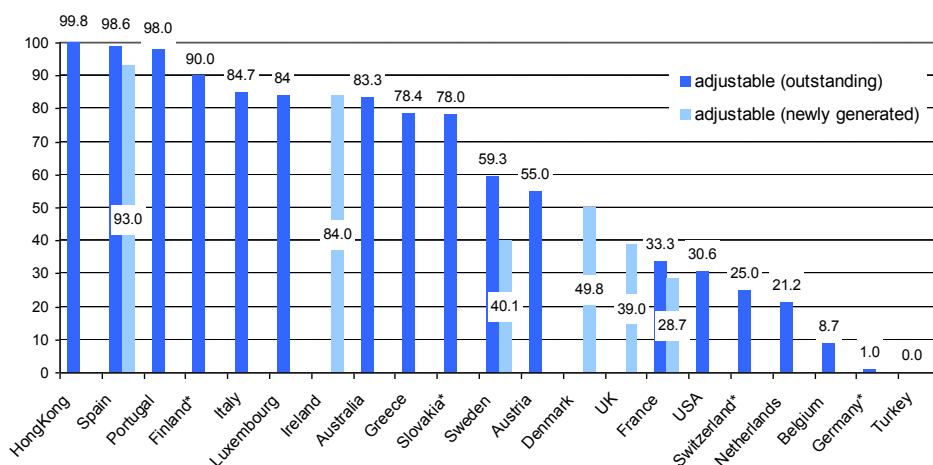
Some products delay the impact of factors, such as interest rate rises, which can exacerbate the burden of debt

Some new products tend to delay the impact of adverse shocks such as interest rate increases on the actual debt burden, among other things by specifying an initial period in which mortgage rates remain unchanged. In the United States, for example, the use of hybrid adjustable-rate mortgages. Adjustable-rate mortgages (ARMs) account for almost a third of new housing loans (Figure 3). The stock of ARMs as a share of total housing loans outstanding is

still relatively low in absolute terms at about 20%, but it is growing. It is growing in particular in the area of sub-prime mortgages, where about two out of three mortgage loans have adjustable rates. Most of these, in turn, are hybrids, where interest rates are fixed for the first few years.

Figure 3. Share of mortgage loans with adjustable interest rates

In per cent of total mortgage loans, newly generated or outstanding, respectively



Notes: * Not specified concerning whether data are in terms of newly generated loans or of outstanding in the questionnaire response. If mortgages with fixed rate for less than 5 years are taken into account as adjustable rate mortgages, it reaches 80.13% for Sweden, 14.82% for Belgium and 32.69% for Netherlands in terms of newly generated contracts. The percentage is in terms of a total amount for Australia, Belgium, Denmark, and Ireland, in terms of number of contract for the United States. It is not specified for the other countries. Values are from 2004 for Portugal, 2005 for the United Kingdom and France, averages from 2003-2005 for Luxembourg, and 2006q1 or q2 for all other countries. For Spain, the value for outstanding is from 2002 and the one for newly generated loans is from 2006q1. In Turkey, variable rate mortgages are *currently* not available, although they were available in the past.

Source: Responses to the OECD Committee on Financial Markets' Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006.

So far, despite the fact that mortgage rates have risen about one percentage point, the various new mortgage products have not yet experienced much of an increase in their contractual rates. Only a few contracts have had their terms reset so far, while the vast majority of mortgage

contracts have not been reset since recent Fed policy moves (an estimated 80% of all mortgage contracts). But the rise of mortgage rates may contribute to a deterioration of credit quality in a *gradual* fashion, and households may overlook this risk. This effect may be particularly strong in the case of households that are relatively new to the mortgage market.

Box 1. Financial pressures for renters

On a different but related issue, household sectors in some countries may also be subject to financial pressures due to increasing housing rents, affecting those households that have not participated in the wealth gains from rising house prices. This issue may have limited potential financial stability implications, consisting mainly of the risks that renters would be unable to service their unsecured debt, but the risk may not be negligible. While rents in many jurisdictions are subject to controls, they nevertheless tend toward a long-run equilibrium relationship with real estate prices.³ House prices have grown faster than rents in many countries and, while housing markets may be cooling, rents still appear to be in the process of adjusting to the higher levels in some countries. Thus, at least until the adjustment is completed, rents may continue to rise reflecting largely earlier surges in prices of owner occupied dwellings.

A case in point may be the United States where the housing market is cooling, while rents may continue to move upwards. A large part of the annualised increase in consumer price indices in the third quarter of 2006 was due to the increase in the price of “shelter”, even if part of this increase may have reflected developments in owners’ equivalent rent of primary residence rather than developments in actual rents. In the euro area the same component of inflation has shown a subdued development, although developments may differ across countries. In Italy, for example, the ratio of annual rent to disposable income increased from 13% in 1995 to 19% in 2004. For renters with the lowest income, the burden of annual rent raised from 21% in 1995 to 25% in 2004. In the Netherlands, rents as a percentage of net income (net rental cost) increased from around 20% in 1990 to around 24% in 1998, although most recent data available suggests that they have since remained broadly stable (data for 2002). In Belgium, developments in rents do not present a significant concern, as rental prices are heavily regulated and the private rental market is quite small.

IV. Possible implications for banks

Profits

*Bank profitability
would decrease if
mortgage lending
slowed*

Given that lending to households has been an important contributor to banking sector profitability in several areas, any significant deceleration in mortgage lending growth would be expected to have a negative affect on bank profitability. The standardisation and computerisation of mortgage loan approvals has advanced rapidly and has allowed banks to deal more efficiently with a larger number of mortgage requests. As a result, more mortgage loans have been granted. A significant decline in mortgage related earnings may raise serious questions about bank profits, given currently compressed maturity yield spreads, limits to further credit-card market growth and the risk that consumer-credit quality may weaken. Concerns were expressed in some CMF member countries with respect to the profitability of credit institutions in a competitive residential mortgage market environment.

Moreover, the capacity to deal with delinquencies may not have advanced at the same pace as the standardisation and computerisation of mortgage loan approvals. There are certainly non-negligible fixed costs associated with delinquency proceedings. Thus, if there were widespread problems in servicing loans, *e.g.* in the form of many small borrowers becoming delinquent, the collection process could turn out to be relatively more costly than in the past for a similar credit volume at stake. This situation would further reduce profits.

Credit risk

*Concerns about bank
exposure to credit risk
are limited*

The credit risk accumulation on bank balance sheets may be limited, however, which is why banks in several countries have seemed comfortable accepting somewhat looser mortgage lending standards, *e.g.* as reflected in rising loan-to-value ratios. Historically, this type of lending has not been a cause of major financial distress of banks, except in the case of some smaller institutions with geographically concentrated exposures that suffered from

regional housing price booms and busts. Currently, there may be fewer concerns about mortgage lending than about unsecured lending in some countries, including the United Kingdom. In the latter, even though the volume of mortgages more than 12 months in arrears are increasing, the level of this category of delinquency is still only at around 0.1% and, thus, significantly lower than the levels of the early 1990s, which peaked at 1.5% in 1993. In France, banks may be less exposed to the credit risk than to the interest rate risk associated with their residential mortgage business. By contrast, in Spain, the opposite applies, as the overwhelming share of mortgages is based on adjustable rates.

*Mortgage
delinquencies remain
low*

In the United States, mortgage delinquencies remain low, although delinquencies on sub-prime mortgages, which represent 15% to 20% of the total residential mortgage stock, have risen substantially in recent months. This rise has been concentrated among adjustable-rate sub-prime loans, which is probably related to interest rates resetting – as the first reset tends to occur much earlier for sub-prime ARMs than for prime ARMs.⁴ Most US mortgages are fixed-rate, however, and most adjustable-rate mortgages are so-called “hybrids” that have payments fixed for some period of time. As a result, payment resets are expected to have only a very gradual effect on aggregate household financial obligations. Mortgages with non-traditional payment schedules such as “interest only” and “negative amortisation” loans have become more popular in the United States. There is no exact information on the prevalence of non-traditional mortgages, but the available information suggests they may represent 15% to 20% of the mortgage stock. While it is true that they are more prevalent in regions with high house prices (suggesting that affordability concerns may have contributed to their popularity), the often large payment changes – associated with these mortgages beginning to amortise – are many years ahead for most of these mortgages, so they should not put upward pressure on financial obligations for some time. There are risks to individual households related to recent developments in mortgage finance, but there do not seem to be large risks to the US household sector as a whole.

Securitisation is a significant factor in the expansion of mortgage lending, providing a degree of protection for originators

Securitisation allows risks to be removed from the balance sheet. These techniques are used more extensively in the United States than in other areas such as Europe, even if activity in the latter is growing fast (e.g. in Italy) and far more rapidly this year than previously expected. In Spain, issuance of mortgage-backed securities has grown significantly, but the credit risk transfer associated with these transactions has been limited as the originating bank retains the bulk of the credit risk. In Australia, securitisation has allowed banks to transfer a significant part of their credit risk exposure to foreign investors and domestic pension funds and insurance companies. In the United States, sub-prime loans, which present relatively greater default risks, are heavily securitised, with banks buying typically just the triple-A tranches, while lower-rated ones are more widely spread among investors. The market for mortgage-backed securities in the United States appears to have performed relatively strongly despite the cooling housing market, including even the subset for securitisations of mortgage loans to sub-prime borrowers.

Increased sub-prime and non-traditional mortgages have made the securitisation process more difficult

Nevertheless, banks are still exposed to the risk of getting stuck in a falling market with illiquid residential (and commercial) property exposures that have been accumulated over a period of perhaps several months and that were intended for sale into a securitisation. In this context, the increased share of sub-prime and non-traditional mortgages has made the securitisation process more difficult, as risk managers are still developing techniques to model these non-traditional instruments so as to price them.⁵ In addition, there is always the potential for problems to arise in complex instruments. Even when banks do not retain any formal residual interest in their sponsored securitisations, they may be under pressure to provide implicit support in order to defend their market share and longer term access to the market.

Banks are also somewhat vulnerable to the effect a slowed housing market would have on general macroeconomic activity

Banks are exposed to developments in housing markets and household mortgage debt over and beyond their direct lending to households and their investments in mortgage-backed securities, as any cooling of housing market developments may affect them through the adverse effects that such a development would have on consumer spending and broader macroeconomic activity. Consumer spending

has benefited in many countries from booming housing markets, especially where equity extraction has been a widespread practise. Looking ahead, there is a risk that the adjustment in the housing market may be protracted. With inflation currently low, it could take a long time to bring real prices back to their equilibrium levels. So far, however, effects on consumption have been limited in those countries where prices have stagnated or fallen. In this context, it should also be noted that statistical models have generally failed to identify a robust relationship between aggregate debt payment s of households and aggregate consumption.

Housing market shocks should not cause critical capital losses to banking systems...

Stress tests have been conducted in many countries, in several of them with an explicit focus on large shocks to house prices and mortgage credit quality (e.g. a 20% fall in real value of house prices or a 200% increase in the probability of default on mortgage loans). The results of the various exercises have been reassuring, as they have tended to show that banking systems would be able to absorb the associated losses without suffering critical capital losses. Indeed, financial conditions for banking sectors as a whole are strong. These sectors have been mostly highly profitable and they are generally well capitalised.

Reputational risk

...although legal and reputational risks should not be overlooked

Residential mortgage business may bring about additional issues for banks over and above the possibility that households may default on their loans. An increase in household delinquencies at any particular bank may have adverse effects on the institution's reputation, even if the effects on its capital may be limited. Moreover, some of the new products can have uncertain risk potential, as a result of their complexity. As these products are now sold to a wider spectrum of customers than was traditionally the case, there is a risk of mis-selling. Allegations of mis-selling could adversely affect a bank's reputation and raise substantive legal issues. In this context, it is not unthinkable that some of the risk transfers from financial institutions to households, including those related to risks associated with mortgages, will be marked as excessive in the future by evolving juridical standards. Most of the complex mortgage products are concentrated at large institutions, thus leaving them relatively more exposed to this kind of risk than smaller banks.

The crisis of open-ended real estate funds in Germany: a tale highlighting the value of reputation for banks

As reputation appears to be an increasingly important parameter in competitive markets, especially for large internationally operating institutions, the risk of reputation loss can indeed be considerable. That there are significant reputational risks in bank's dealings with its clients was illustrated by the crisis in open-ended real estate funds in Germany. Attempts by one German bank to preserve its reputation and, perhaps, political pressures explained its decision to compensate investors for losses incurred in its open-ended real estate funds, although it was not legally obliged to do so. These funds registered large inflows over the last couple of years in Germany, but their performance was relatively poor. Investors began to withdraw funds in 2005, and this process accelerated and resulted in a rapid "race for the exit" motivated by investors' concerns that the fund would be re-evaluated, perhaps with substantial capital losses for them. As the assets of the fund were considerably less liquid than liabilities, three funds were forced to close, meaning that further withdrawals would not be allowed. Before eventually re-opening its real estate fund in March 2006, one German bank promised to compensate all investors that had invested within a specific period prior to the initial closure of the fund, so that they would not suffer any capital losses as a result of the re-evaluation of the fund.

V. Conclusions and selected policy issues

Significant vulnerabilities are concentrated in specific groups of the household sector

Discussions of household mortgage debt developments suggest that the consequences of the situation regarding financial stability appear to be limited overall, at least over the *short term*. The level of concern expressed by policymakers in OECD countries is mostly low to moderate. What is noticeable, however, is that this level has not decreased in any country and has actually increased in several countries (Table 6). Nonetheless, the general view is that significant vulnerabilities are concentrated in specific and rather small groups within the household sector, so that the wider macroeconomic consequences of the materialisation of risks and any effect on financial stability would likely to be limited.

There may be a broader lack of understanding of long-term mortgage risks...

Nonetheless, taking a long-term perspective, there is concern that households more generally do not fully appreciate the various long-term risks they are exposed to, including a softening in asset prices and particularly house prices, and risks to the macroeconomic outlook such as a rise in energy prices.

Table 6. General level of concern over housing market developments

How would you qualify your overall level of concern about residential mortgage loans and how has it changed over the past few months?			
(responses shown below as of September 2006)			
Level of concern:	Level of concern has:		
	<i>decreased</i>	<i>remained broadly unchanged</i>	<i>increased</i>
very high			
high		Slovak Republic	
moderate		Belgium Czech Republic France Poland United States	Greece Hungary Portugal Spain Turkey
low		Australia Austria Denmark Finland Hong Kong, China Italy Luxembourg Sweden United Kingdom	
very low			

Source: Responses to the OECD Committee on Financial Markets' Questionnaire on *Household sector debt, housing markets and new mortgage products*, September 2006.

...while the direct exposure of households to other risks, such as longevity risk, appears to be increasing

This concern is exacerbated by developments in other areas including in particular those regarding pension provision, which are having the effect of increasing the direct exposure of households to investment and longevity risks. Policymakers are aware of this development and are already taking measures to begin to improve financial literacy levels of individuals and the information available to them,⁶ although the effect of some of these measures is likely to materialise only rather slowly. In any case, policymakers recognise that developments in household balance sheets bear further close monitoring.

As well as raising household awareness of such risks, policy can play a role...

Policy may have a role to play that goes over and beyond ongoing efforts to raise households' awareness of their cumulative risk exposures and improve households' (intellectual and other) capacities to deal with these risks. In particular, it could include facilitating the development of financial market instruments that would help both households and banks to manage the risks that the former are facing.

...in supporting the development of financial market instruments that facilitate management of those risks

In the present context, housing-related financial markets could in principle allow banks and households to diversify or hedge their real estate holdings or exposures to related risks. For example, exchange-traded futures and options based on house price indices for several cities in the United States were launched at the Chicago Mercantile Exchange (CME) in May 2006. It is uncertain, however, whether households would be able to participate directly in that market and the term of contracts is relatively short with a maximum of twelve months and the liquidity currently seems to be limited. These contracts are likely to be more directly useful mostly to banks that have mortgage risk exposure to residential areas as a whole. What is interesting to note, however, is that the launch of this derivatives market was facilitated by the availability of the so-called *Case-Shiller Indexes*, which were developed by two economists (Case and Shiller) and represent movements in housing price values.⁷ This observation points to the hypothesis that policy could play a role in improving the statistics underlying the pricing of risks and making such statistics more easily available to market participants, so as to support the development of markets for such products.

Notes

1. Explicit empirical analyses of the effects of interest rate increases on the costs of household mortgage loans have been conducted in some countries. See *e.g.* Bank of Italy, “Survey of Household Income and Wealth”, *Economic Bulletin*, No. 42, March 2006.
2. Nathalie Girouard, Mike Kennedy and Christophe André, “Has the rise in debt made households more vulnerable?”, Economics Department Working Paper No. 535, ECO/WKP(2006)63, January 2007.
3. In several countries, the growth of rental prices is effectively capped, however. For example, in the Netherlands, even after some loosening of current restrictions to rent increases, about half of all homes would fall under a regime with capped rental increases.
4. “A supervisory perspective on enterprise risk”, Remarks by Ms Susan Schmidt Bies, Member of the Board of Governors of the US Federal Reserve System, at the American Bankers Association Annual Convention, Phoenix, Arizona, 17 October 2006. Note that the classification of loans to sub-prime or not is subject to some controversy, however.
5. US regulators were reported to have worked on a draft joint guidance on such mortgages.
6. For example, the Austrian Financial Market Authority (FMA) released “Minimum Standards for Granting and Managing Foreign Currency Loans” in October 2003. Furthermore, in cooperation with the FMA, the Österreichische Nationalbank created a brochure that provides a clear and concise overview of the risks for households associated with foreign currency loans.
7. In another recent example, the Zurich Cantonal Bank began offering mortgages where interest or principal payments were indexed to Zurich house prices. See also Groome, T, N. Blancher, F. Haas, J. Kiff, W. Lee, P. Mills, S. Nakagawa, P. Ramlogan, O. Khadarina, Y. Sook Kim, (October 2006) “The Limits of Market-Based Risk Transfer and Implications for Managing Systemic Risks”, *IMF Working Paper* WP/06/217.

Part IV

Emerging Markets

Government Debt Management and Bond Markets in Africa

Hans Blommestein and Greg Horman

This article presents highlights from the forthcoming OECD cross-country study Public Debt Management and Bond Markets in Africa.

Debt managers from an increasing number of emerging market jurisdictions face challenges similar to those of their counterparts from advanced markets due to competitive pressures from global finance and the related need to implement OECD leading practices in this policy area. The article shows that OECD standards in public debt management and related market operations are, therefore, of great importance for public debt management and bond market development in Africa. Several African debt managers have introduced the leading debt management practices of OECD countries, use them for designing new debt strategies (including for managing contingent liabilities), and have made impressive progress in developing their local government securities markets. Many countries in the region are taking advantage of debt reduction initiatives. Avoiding falling back into positions of unsustainable debt is identified as a key challenge for many African governments.

OECD financial policy makers are increasingly interested in developments in emerging markets, including those on the African continent. Moreover, emerging markets (including the latest emerging market region, Africa) are an increasingly important asset class for investors from the OECD area. Thus, the policy conclusions and priorities identified here are of interest to not only African countries but also the OECD area and other emerging market countries. Local bond markets in several African countries have gained in strength in terms of liquidity and maturity structure, making them more attractive for important categories of OECD investors and less vulnerable to exchange rate shocks.

Government Debt Management and Bond Markets in Africa

Hans Blommestein and Greg Horman*

I. Introduction and overview

***OECD cross-country
study on public debt
management and
bond markets in
Africa***

This article presents highlights from the forthcoming OECD cross-country study on public debt management and bond markets in Africa.¹ The study benefited from the policy conclusions and recommended strategic priorities that emerged from the *First OECD Forum on African Public Debt Management*, held in December 2006 in Amsterdam,² and the suggested critical operational issues in developing efficient and liquid primary and secondary bond markets from the *First Regional Workshop on African Debt Management and Bond Markets*, held in April 2007 in Johannesburg.³

***Policy analysis draws
on leading practices
identified by the
OECD Working Party
on Debt Management***

The policy analysis draws heavily on the leading practices identified by the OECD Working Party on Debt Management, as they serve in practice as a global standard in this area of government financial management.⁴ Debt managers from an increasing number of emerging market jurisdictions face challenges similar to those of their

* The authors are from the Financial Affairs Division of the OECD Directorate for Financial and Enterprise Affairs, where Hans Blommestein is the Head of the OECD Public Debt Management and Emerging Financial Markets programmes and Greg Horman is Consultant and the technical expert for the OECD project on African Debt Management. The opinions expressed and arguments employed in this article do not necessarily reflect the official views of the OECD or of the governments of its member countries.

counterparts from advanced markets due to competitive pressures from global finance and the related need to implement OECD leading practices in this policy area. The article shows that OECD standards in public debt management and related market operations are, therefore, of great importance for public debt management and bond market development in Africa. Several African debt managers have introduced the leading debt management practices of OECD countries, use them for designing new debt strategies (including for managing contingent liabilities), and have made impressive progress in developing their local government securities markets. Many countries in the region are taking advantage of debt reduction initiatives. Avoiding falling back into positions of unsustainable debt is identified as a key challenge for many African governments.

Emerging markets are an increasingly important asset class, including Africa

OECD financial policy makers are increasingly interested in developments in emerging markets including those on the African continent. Moreover, emerging markets (including the latest emerging market region, Africa) are an increasingly important asset class for investors from the OECD area. Thus, the policy conclusions and priorities identified here are of interest to not only African countries but also the OECD area and other emerging market countries. Local bond markets in several African countries have gained in strength in terms of liquidity and maturity structure, making them more attractive for important categories of OECD investors and less vulnerable to exchange rate shocks.

This article proceeds as follows. Section II identifies some of the main policy issues and questions in debt management and government securities markets in Africa. Section III looks in closer detail at challenges for local-currency bond markets in African countries and the development of debt strategies. Both of these sections include a cross-country overview and country examples. Section IV considers the management of contingent liabilities, drawing on principles developed in the OECD area and the experience of South Africa. Section V closes with policy recommendations and priorities.

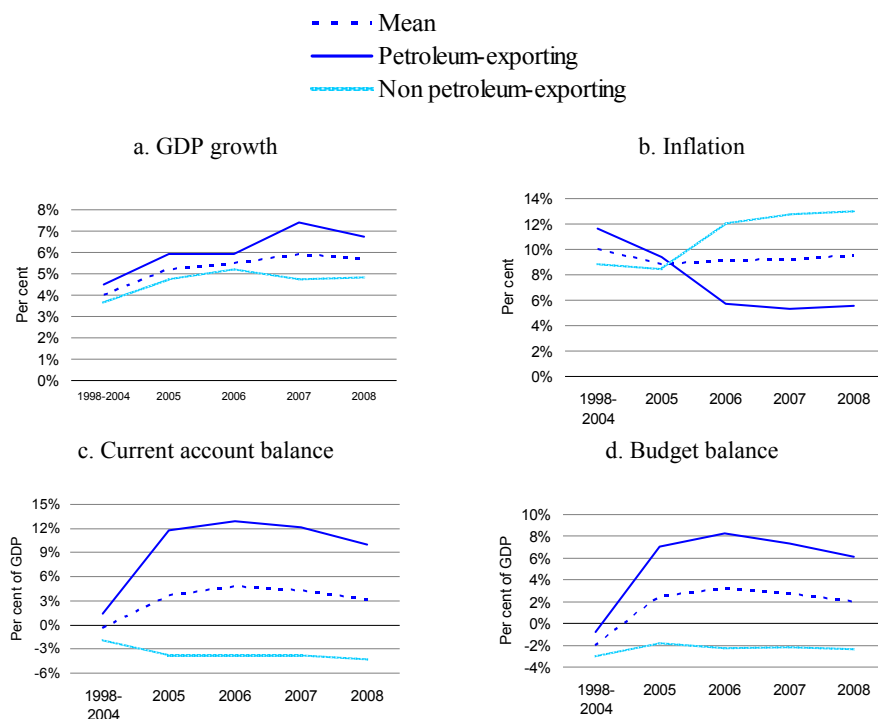
II. Review of policy issues and questions

Cross-country overview

African economies are diverse

At a single-country level, it is difficult to generalise about debt management and government securities markets in Africa. African countries are very diverse in terms of their economies, debt situations, debt management practices and capacity, and government securities markets. Taking a cross-country perspective, however, allows a number of common trends to be identified.

Figure 1. Macroeconomic performance of African countries

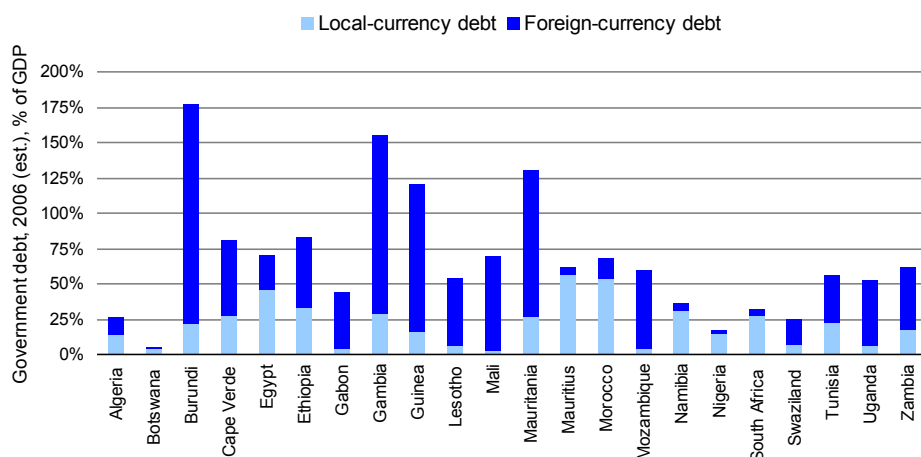


Source: OECD Development Centre and African Development Bank, *African Economic Outlook* 2007.

GDP growth continues to be strong and macroeconomic conditions have improved

Turning first to the macroeconomic background, growth continues to be strongly on track in Africa.⁵ From being on average around 4% in the period of 1998 to 2004, annual GDP growth since then has been between 5% and 6% (Figure 1a). Across the continent, the average inflation rate is now around 9%, with markedly different experiences between net exporters and net importers of petroleum (Figure 1b). Current account balances show a diverse picture but have improved for much of Africa, notably the petroleum-exporting countries (Figure 1c). At the same time, budget balances have improved. They are materially positive for petroleum-exporters and have remained stabilised at a deficit of between 2% and 3% of GDP for the others (Figure 1d).

Figure 2. Currency composition of government debt in African countries



Source: IMF, country authorities, authors' calculations.

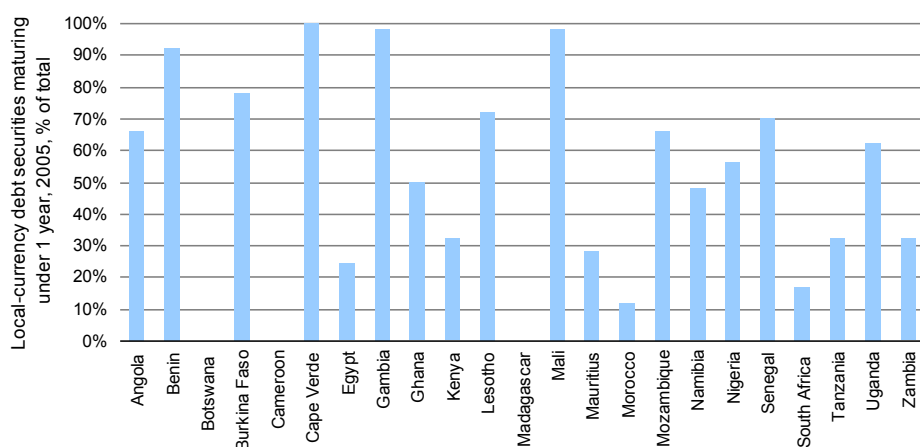
Debt levels are still a problem

Over recent years, a number of countries have benefited from external debt relief under multilateral debt relief initiatives. That said, in many countries, debt levels are still a problem, especially in view of structural vulnerabilities. Similarly, after debt relief, risk-based debt sustainability needs to remain a focus of debt strategy, supported by sound macroeconomic policies.

Foreign-currency debt predominates, and local-currency debt is mainly short-term

Foreign-currency debt predominates in African countries (Figure 2). This situation is typically a consequence of a reliance on concessional multilateral and bilateral funding and rudimentary domestic markets, but some African countries now have good access to the international capital markets or have begun to develop their domestic markets. Local-currency debt is predominantly short-term (Figure 3), but some countries successfully issue across the yield curve and out to long tenors. The issuance of local-currency debt in some countries is erratic and in small volumes, leading to problems in developing fungible and liquid instruments and benchmarks. These considerations raise the question of what are the priorities and appropriate policies for developing market-based funding.

Figure 3. Tenor of local-currency government debt securities in African countries



Source: Standard and Poors', country authorities, authors' calculations.

Domestic market needs to be developed

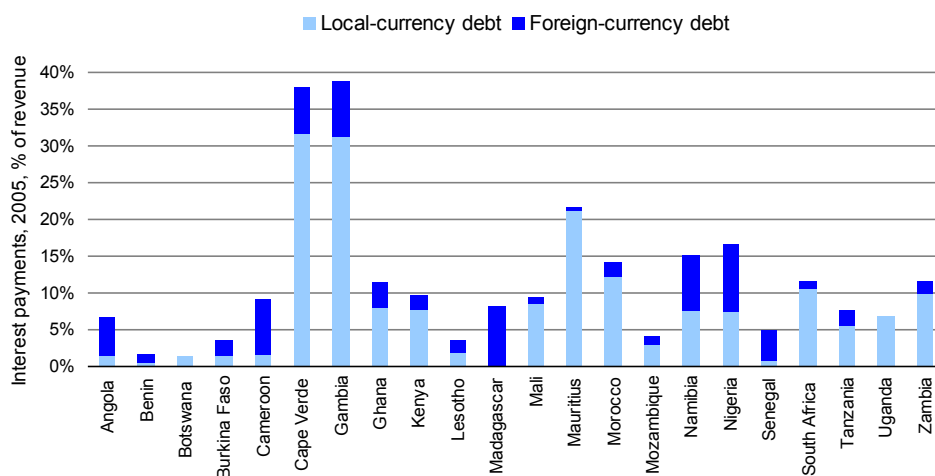
Local commercial banks tend to be the main holders of domestic securities. This reflects weaknesses in the commercial lending operations and, in some cases, excessive requirements to hold government securities. Some countries, however, have relatively vibrant pension funds and other institutional investors, which encourages more diverse ownership. Non-resident holdings are

typically low. Domestic market infrastructure, including settlement and custody systems, is often weak. These considerations raise the question of what priority should be given to developing the domestic market and investor base and the correct sequencing of steps for doing so.

Local-currency debt is relatively costly but minimises exchange rate risk

Interest payments on local-currency debt often consume a larger share of revenues than those on foreign-currency debt, even though foreign-currency debt predominates in nominal terms (Figure 4). This is because local-currency debt is more costly than foreign-currency debt (Figure 5), reflecting the availability of externally sourced funding on concessional terms and high real interest rates in the domestic market. The policy question arises concerning the appropriate balance between minimising cost and minimising risk, in particular taking account of the major risks (interest rate, exchange rate, and refinancing) and possibility of other budgetary shocks, such as from a sudden drop-off in aid inflows.

Figure 4. Interest payments on government debt in African countries

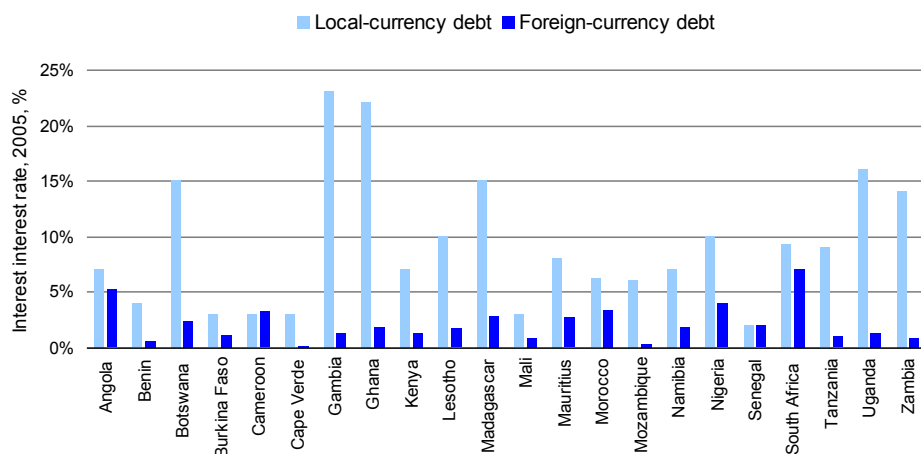


Source: Standard and Poors', country authorities, authors' calculations.

Quasi-government debt is a common feature

Quasi-government debt is a feature in many African countries. For instance, some central banks issue their own bills to manage liquidity or implement monetary policy. This may be a consequence of an absence of a sufficient supply of government securities, but the question arises whether the existence of central bank bills impedes the development of the government securities market. Similarly, there may be pricing anomalies or fragmented liquidity when government securities and central bank bills co-exist. Some debt of state-owned enterprises, other government agencies, or even the private sector is guaranteed as well. With some exceptions, guarantees are not well managed or accounted for in African countries, albeit that situation is not unique to Africa.

Figure 5. Implicit interest rate on government debt in African countries



Source: Standard and Poors', country authorities, authors' calculations.

Institutional frameworks are often weak

Turning to institutional problems and issues, African countries generally have explicit legal requirements governing debt contracting and servicing, but the framework is not always clearly defined and adequately implemented. The legal requirements for transparency and accountability are often limited. The resources available to debt management are constrained in many countries, again a situation not unique to Africa. This includes the quantity

of staff, their skill levels, and technological resources for managing the debt stock and new debt issuance on a professional basis.

Debt management has links with fiscal and monetary policy

Given the interdependencies between their different policy instruments, it is important that debt managers, fiscal policy advisers, and central bankers share an understanding of the objectives of debt management, fiscal, and monetary policies. The role of central banks is of special relevance for Africa, where many debt management activities continue to be performed by central banks.

Good governance is important

The specific institutional structure for debt management is less important than ensuring that there is good governance and that there are forward-looking policies focused on risk-based debt sustainability. It is worth noting, however, that institutional responsibilities are often fragmented across front and back office functions, across local-currency and foreign-currency debt, and across agencies in Africa countries. In several countries, the focus of debt management as a distinct activity is still heavily on debt recording and servicing. The middle office functions of debt strategy formulation and risk management are often absent. All these factors impede taking an integrated approach to debt management. Co-ordination between debt management and macroeconomic policies is often weak.

Formal debt strategies should be developed

Some African countries have developed formal debt strategies. A formal strategy explicitly balances cost and risk, takes account of demand constraints but often incorporates initiatives to develop the market and new funding sources, and supports macroeconomic stability and debt sustainability. For most African countries, though, debt strategy remains *ad hoc*. Admittedly, the range of funding sources is often narrow, and discretion in terms of the risk characteristics of new debt may be limited. The critical issue here is that opportunities may be missed, at the margin, to improve the structure of the debt or widen the range of funding sources. For countries that have benefited from debt relief, the lack of a formal debt strategy increases the risk of a return to an unsustainable debt position in future.

Country examples

South Africa

In *South Africa*, the Reconstruction and Development Programme in 1993 was the first socio-economic policy and development planning framework for rebuilding South Africa post-apartheid. It focused on meeting basic needs, developing human resources, building the economy, and democratising the state and society. It was followed in 1994 by a white paper on reconstruction and development, which, however, was seen as inadequate to deliver the required economic growth without further macroeconomic and structural policies to accelerate growth. This paved the way for South Africa's current macroeconomic policy, as set out in the 1996 growth, employment, and redistribution (GEAR) strategy. The GEAR strategy established economic targets, including a budget deficit target, and outlined additional financial reforms, such as improvements in revenue collection. An important focus of GEAR was on restoring the international credibility of the economy.

The picture on the debt side over the past decade in South Africa has been impressive. The budget deficit as a percentage of GDP has declined. Debt has increased in gross nominal terms, but net debt has fallen as a percentage of GDP, as have debt servicing costs. The debt portfolio is diversified across instruments and tenors but is dominated by bonds issued in the domestic market, which are attractive from a risk-reduction standpoint. Liquidity in the domestic bond market has grown significantly, while spreads to yields in developed markets have declined. There are both fully developed nominal and real government yield curves.

Debt management arrangements in South Africa are characterised by sound fiscal and monetary policies, co-ordination between debt strategy and monetary policy, stability in the macroeconomy and financial sector, strong credibility of the government in both domestic and external markets (reflected, for example, in an investment-grade credit rating), and high-level buy-in of the debt strategy at cabinet level. An ongoing challenge is to build operational debt management capacity in the finance ministry.

Nigeria

Recent restructuring has resulted in significant amounts of debt in *Nigeria* being cleared. On the domestic side, debt is accounted for by, among other things, \$10 billion of securities and still over \$12 billion of arrears to contractors and others. A strong grasp on contingent liabilities is lacking. Successful initiatives regarding domestic securities have included lengthening the maturity structure and smoothening the redemption profile. There is a system of primary dealers and market makers. While in general the selection of dealers has been careful, dealers have not always behaved well. Banks dominate holdings of government securities, but holdings by pension funds have grown. Much of domestic issuance is undertaken not to fill a funding gap but, instead, to provide securities to the market for its development. Challenges for Nigeria include an economy subject to macroeconomic volatility and the need to improve governance, improve data collection and data quality, strengthen the legal framework for debt management, develop the local market, widen the investor base, and improve the sovereign credit rating.

Kenya

The authorities in *Kenya* began a five-year reform programme in 2005. The current situation is characterised by weak institutional arrangements, scattered organisation, *ad hoc* strategy, and serious understaffing accompanied by high turnover. There is weak co-ordination of debt management with monetary and fiscal policy, which leads to several problems, including a lack of clarity regarding which agency is responsible for domestic debt management. Co-ordination with cash management is poor as well. Until recently, debt recording was not comprehensive and reliable, or the information was not fully exploited. Kenya has benefited from the assistance of MEFMI (Macroeconomic and Financial Management Institute of Eastern and Southern Africa) and other international organisations. There is a need in Kenya to establish a long-term perspective on the domestic market and build relationships with the market. Also needed is high-level political ownership to drive through change in debt management, in particular in securing wide stakeholder participation and buy-in.

Uganda

Uganda has begun formalising its debt management arrangements. Peculiarities of the situation there discourage development of the domestic market. Almost half of the budget is donor funded, and post-debt relief the country is attractive as an external borrower. More participants need to be attracted to the domestic market. There is concern that the situation is dangerous without a formal debt strategy, though. Currently, no one in the government is working on a formal debt strategy, due to limited resources. The authorities identify a need to develop a long-term sustainability path, better analysis of the debt, and better ability to manage risk in future. Separation of fiscal and monetary policy is needed as well. The quality of information on the debt is poor, despite much duplication of effort.

Domestic government securities in Uganda are currently used only for monetary policy operations. Since 2004, the central bank has issued 2, 3, 5, and 10-year government bonds, but issuance of the 5 and 10-year bonds is going to be suspended. Treasury bills are also issued for liquidity management. In conducting monetary policy, the yields on bonds are generally higher than yields on treasury bills, reflecting the term premium for longer-dated securities. Further reliance on long-term securities would increase the budgetary cost of liquidity management.

Member countries of MEFMI

Six of the 13 *member countries of MEFMI* are beneficiaries of debt relief, and for them there is a need to avoid falling back into unsustainable debt positions in future. As a general rule, domestic debt funds the budget deficit on a residual and gap-filling basis, after all forms of grants and concessional external borrowing have been exhausted, although the lower middle-income countries, which are ineligible for concessional borrowing, tend to rely more on their domestic markets. Consequently, there is a need to develop local markets, which currently are characterised as undiversified, small, and lacking in benchmarks, secondary market activity, and institutional investors. MEFMI puts forward that regional harmonisation would contribute to deeper, more liquid, and more diversified sources of borrowing for member countries.

Within countries, there are institutional and legal bottlenecks. Finance ministries have few resources for debt

management, and staff skills are low and often non-existent in terms of middle office functions. Developing capacity in-house is difficult, especially with high turnover and salaries that are uncompetitive with the private sector. Data and debt recording systems are poor, especially for domestic debt. The legal frameworks for debt management are out-dated, but updating them is a lengthy, cumbersome process. MEMFI member countries have received technical assistance from many providers, but it has not always been effective.

Tanzania

In *Tanzania*, the finance ministry lacks the capacity to perform debt management functions on its own. High staff turnover retards continuity of capability, and there are difficulties in recruiting new staff. As a consequence, the ministry relies heavily on staff from the central bank to carry out debt management functions. The government also lacks the capacity to perform cash management. Persistent seasonal excess liquidity characterises the market. The market, however, anticipates the mopping up operations, leading to a high cost of doing so. The introduction of new tradable instruments may alleviate the problem and enable further diversification of the debt portfolio. Tanzania already issues bonds across the yield curve, by means of auctions done using an in-house auction system.

Mauritius

In *Mauritius*, the central bank performs a number of debt management functions on behalf of, and in co-ordination with, the government. The roles and objectives for debt management and monetary policy are specified, allowing for a separation of accountabilities. The central bank issues its own bills for monetary policy purposes but, according to central bank authorities, the existence of central bank bills alongside treasury bills has not posed problems. The central bank advises the fiscal authorities of the effects of government debt levels on the achievement of monetary objectives.

Conclusions

Sound debt management reduces the cost and risk of debt

Sound debt management practices and robust securities markets can help reduce the cost of managing public debt and maintaining it at sustainable levels. Prudent debt management, fiscal, and monetary policies can reinforce

one another in helping to reduce the risk premium in the structure of long-term interest rates. Borrowing limits and sound risk management practices can help to protect the government's balance sheet from debt servicing shocks.

International standards have become of greater importance

International standards in public debt management and related market operations have become of greater importance to African debt managers. They have introduced the leading debt management practices of OECD countries, have made impressive progress in developing their local government securities markets, and are taking advantage of debt reduction initiatives. An important challenge for many African countries is to avoid falling back into positions of unsustainable debt.

An integrated view on debt management is desirable

The division of work for debt management functions across agencies, including the central bank, is less important than ensuring that all the functions (strategy formulation, auctions and other methods of issuance, risk management, debt recording and servicing, and so on) get done as professionally as possible. An integrated view on debt management is desirable. Concentrating debt management activity in one agency may facilitate that, and separation of debt management from the central bank would be consistent with that. African countries, however, are likely to need to rely on central banks to perform some functions over the near and medium term. To that end, clear agency agreements and delineations of responsibilities and decision rights are essential.

Strengthening debt management should be an ongoing process

Strengthening debt management should be undertaken as an ongoing process, not a one-off exercise. It also needs to be seen as part of a country's wider monetary and fiscal development. High-level policy makers have to be brought on board. The delivery of technical assistance to-date has not been uniformly effective and has often lacked good co-ordination across providers.

III. Bond markets and debt strategy

Cross-country overview

Challenges for bond markets and debt strategy in Africa include weaknesses in monetary policy, the structure of local banking sectors, and capital account regimes.

Weaknesses exist in monetary policy

Monetary policy frameworks in Africa are more complex than in the past. Although there is less reliance on an exchange rate anchor, most countries still have a *de facto* exchange rate regime. This means that monetary policy is not transparent, which generates risk. Formal and informal restrictions, including on interest rates, are still widespread. A persistent liquidity overhang remains unaddressed. These weaknesses can retard development of the domestic debt market and can contribute to high interest rates.

Banking sectors are generally non-competitive

The banking sectors in African countries are generally non-competitive. Non-competitive banking sectors typically do not press for financial innovation, may collude in auctions of government securities, tend to hold securities to maturity, and are less likely to build secondary markets. These factors also contribute to high interest rates.

Most countries still restrict portfolio flows

Most African countries still restrict portfolio flows. They justify those restrictions on the grounds of reducing macroeconomic volatility. In the absence of investment options, the controls arguably have a benign effect, but the situation in Africa is changing. The conclusion is that African countries should review their capital account rules and the impact of foreign participation on the sustainability of their debt markets.

There are problems at the micro-structure level

At a more micro-structure level, there are a number of general problems with bond markets throughout African countries. They include a small number of listings, a lack of longer-term maturities, low market turnover, and a lack of investors. Among other things, one consequence is the lack of reliable yield curves, pricing benchmarks, and other financial products to hedge risk. There are solutions, or at least mitigations, to those problems. Macroeconomic and political stability are important prerequisites. Developing market infrastructure, including trading, information dissemination, settlement, and custody systems, is important, as well as putting in place incentives that reinforce good market participation. Building a yield curve of government securities is beneficial to the rest of the financial market.

Split responsibilities, a lack of staff capacity, the relationship with the macroeconomic framework, and a lack of access to domestic markets are further

complications for African countries in developing a debt strategy. Africa shares these challenges with other emerging markets, but the difference is one of degree.

Country examples

South Africa

The bond markets in *South Africa* are relatively advanced. There is a well developed market for government securities, and corporate bonds have seen significant growth in recent years, although the latter still account for only 10% of the bond market. An issue for South Africa is to ensure that the government does not crowd out the corporate market.

Nominal government bonds are highly liquid. Liquidity in the government's inflation-linked securities is not so strong, reflecting buy-and-hold investor behaviour, but the bonds have been cost-effective for the government as issuer. This is an experience commonly seen in other countries with inflation-linked bonds, including several OECD countries. There is no futures market in South Africa. An active repo market exists, however, and market participants see no real downside risk to the lack of a futures market. South Africa's settlement and clearing systems are compliant with international best practice, which reinforces participant confidence. An attempt to launch an electronic trading platform failed, probably attributable in the main to timing, as a central counterparty was lacking at the time. A central counterparty is a necessary, although not sufficient, pre-condition for success.

Non-resident holdings are an important part of the government securities market. The country's investment-grade sovereign rating contributes to that. Non-residents have exhibited an abiding interest in the market and have not withdrawn from the market over the medium and long term even when there has been market volatility.

South Africa has a primary dealer system. One question currently under consideration is whether primary dealers must be domiciled locally, as all currently are, or whether remote participation should be allowed. Interestingly, anecdotal evidence is that much of the market for South African government securities occurs in London. A lack of

good data means that it is not possible yet to establish just how extensive that offshore trading actually is.

Franc zone countries

The *franc zone* consists of 14 countries across the West African Economic and Monetary Union (WAEMU) and Central African Economic and Monetary Union (CAEMU) areas. Government debt portfolios in the franc zone are dominated by multilateral and bilateral external loans on concessional terms. To-date, priority has been given to external funding because of the low savings rate in the region, as well as monetary rules that firmly limit the monetisation of public deficits. Development of the domestic debt market started in the WEAMU in 2001 following the adoption of a new regulation on the issuance of treasury bonds. Although a similar regulation was adopted in the CAEMU region, only one issuance has been organised to date.

As a general rule, in franc zone countries, there are no formal debt policies and benchmarks, aside from IMF conditionality on new loans (for instance, a minimum grant element of 35%), regional convergence criteria (such as the avoidance of new arrears and a limit on total public debt of 70% of GDP), and limits on direct monetary financing of national treasuries (20% of fiscal revenue in the previous fiscal year). That said, national public debt committees have been set up in some countries. In principle, they are in charge of designing debt strategy and policy, as well as ensuring its implementation by having to approve future loans.

There are several challenges to formulating and implementing a debt strategy in the franc zone countries. The lack of a holistic vision on debt results in fragmentation of debt management. External debt, domestic debt, and contingent liabilities are managed without co-ordination or consistency with transparent benchmarks. Regulation in respect of the responsibility for contracting new debt and contingent liabilities, information flows, transparency, audit, and so on, is lacking, although there have been some reforms in this regard. It is argued that within the franc zone, but not exclusive to it, some countries exhibit complacency, even post-debt relief, about accumulating debt to finance development and poverty reduction regardless of the sustainability of debt levels.

The need for capacity building is a major element in improving debt management practices. This includes sensitising authorities so as to build political will for debt management initiatives and securing training on debt strategy formulation consistent with macroeconomic policies and long-term sustainability targets. A regional approach to regulation and debt crisis prevention would offer benefits as well.

Tanzania

Main challenges for a formal debt strategy in *Tanzania* are a background of macroeconomic instability and the need to maintain debt sustainability. The question arises of how to link the debt strategy, and debt management in general, with other macroeconomic policies. This is made more difficult by the existence of other challenges already mentioned, including sub-optimal institutional structures, problems retaining skilled staff, and quality problems with data on the debt stock. There is also the question of how to develop the market further to the next level, particularly in light of a capital account that is not yet fully liberalised.

Kenya

In *Kenya*, the government has successfully restructured much of the domestic debt stock since 2001. The portfolio went from being predominantly short-term to around 70% medium and long-term today. Transparency about the government's borrowing intentions was a major contributor to the success of the restructuring. The Kenyan practice is to publish the volumes, tenors, and calendar of securities to be auctioned. The market in turn responds with information about its demand for volumes and maturities. There are also monthly consultations with investors and intermediaries on planned bond issuance.

The Kenyan authorities cite a number of problems with, or that have an impact on, the government securities market: wide fluctuations in macroeconomic variables, unstable government expenditure patterns, limited money and capital markets, opaque pricing due to a lack of benchmark bonds, limited market participation due to a lack of connectivity with the central securities depository, a lack of formal mechanisms to ensure that government funding requirements are met at least cost and risk, and barriers to market integration within the sub-region.

Malawi

Malawi provides an example of the problem of public perceptions. A treasury bill market there flourished in the early 2000s. The public perception, however, was that the well-connected subscribed to all the stock, and the funds raised were used by the government on poor-quality investment that also benefited the same people.

Conclusions

Debt managers need a multiple objectives framework

For Africa especially, there is a trade-off between, on the one hand, relying on market-based funding and developing the domestic market versus, on the other hand, simple cost and risk considerations. Consequently, debt managers need a framework for dealing with multiple objectives. In many African countries, debt sourced in the domestic market is not currently an active policy choice but, instead, a consequence of donor inflows. Domestic debt can sterilise inflows or satisfy a funding gap when those inflows trail off. Ideally, the debt strategy would encompass the entire debt and also take account of guarantees and on-lending. A comprehensive approach like that takes time to develop, so it is appropriate to start with the biggest sources of risk first. The development and implementation of a holistic debt strategy, including for guarantees and on-lending, is facilitated if all the activities are centralised and controlled in one agency. The strategy should include an explicit link to debt sustainability.

Legal frameworks need to be improved

More work needs to be done on improving the legal framework for debt management. In most countries, who is allowed to borrow is adequately defined. Reform should be focused on transparency requirements and accountability and the requirement to develop a debt strategy. Debt strategy needs to link up with macroeconomic policy, and middle offices have a role to play in that. The quality of debt matters, while securing and maintaining a sovereign credit rating can be effective in disciplining policy makers.

Countries should develop debt strategies

A good first step for many countries in developing a debt strategy would be to codify the existing implicit, or *de facto*, debt strategy. Incremental improvements over time and the use of straightforward analysis, as opposed to sophisticated models, are appropriate too. In all cases, the resulting strategy and sequencing measures need to be

tailored to country-specific circumstances. There is a real need to ensure debt sustainability even after debt relief is granted and even if all borrowing is on concessional terms.

Considerations in developing, communicating, and evaluating the debt strategy include the appropriate time horizon. The time horizon needs to be realistic, given the macroeconomic background. Likewise, the strategy needs to answer whether the benchmarks adopted represent hard rules versus targets around which some discretion is allowed and, if the latter, to what degree. This has implications for predictability, transparency, and accountability. Communication is important. It is important to present the strategy in a way that is simple, straightforward, and convincing for policy makers, the financial markets, and the public.

Countries should restrict their debt management activity to simple instruments

The debt instruments and more complex products, such as swaps, used in implementing the approved debt strategy need to be well understood by debt managers, and the risks associated with them need to be able to be managed. This suggests that, for the time being, most African countries should initially restrict their debt management activity to simple instruments. As a consequence, they will at first not be able to separate the risk characteristics of actual borrowings from the preferred risk composition of the debt portfolio, as many OECD countries have been able to do through the use of derivatives. Later on, when the debt strategy and associated operations are firmly in place, the use of derivatives can be considered. However, their introduction should be accompanied by a governance system with sound risk controls based on OECD best practices.

Higher risk of default could be better managed through dialogue with stakeholders

The risk of default, or (less dramatically but still with important implications for funding costs) of downgrades, is higher for many countries in Africa than in other emerging markets. This disciplines policy makers. It also raises the question of whether African countries would benefit from policy dialogue with other countries on how best to interact with credit rating agencies and to manage relationships with them.

***Wider macroeconomic
and institutional
reforms are needed***

Debt market development needs to be part of wider macroeconomic and institutional reforms, and a priority is to increase the transparency and consistency of monetary policy. Eliminating structural obstacles will lead to greater efficiency in the financial sectors in African countries.

IV. Management of contingent liabilities

***Perspective of the OECD Working Party
on Debt Management***

***Contingent debt is a
latent form of
government debt***

An experts group within the OECD Working Party on Debt Management has formulated a set of best practices in managing explicit contingent liabilities.⁶ The best practices are written from the perspective of debt managers, but they also address how guarantees should be treated more generally, in particular in budget legislation. Government-guaranteed debt is similar to conventional government debt in many ways. Contingent debt is a latent form of government debt. Like conventional bonds, contingent debt is based on contract and is serviced, if necessary, at expense to the taxpayer. Thus, measures of cost and risk should apply jointly to conventional debt and guaranteed debt. Debt managers are well positioned to manage the risks of the joint portfolio.

***It is important to
assess guarantees
against alternative
arrangements***

Before guarantees are granted, it is important to assess them against alternative arrangements, particularly to explicit on-lending. The conclusion made in many OECD countries is that guaranteed debt typically has higher funding costs and may entail higher financial risks for the government. In some cases, though, guarantees may offer sufficient benefits, such as the possibility to use them in a way that allows the government to share credit risks with lenders. There may also be administrative benefits from involving outside lenders in a government-sponsored programme.

***Use of guarantees
necessitates a sound
governance system***

The use of guarantees necessitates a sound governance system. There should be rules for the transparent reporting of the costs of guarantees. The portfolio of guarantees should be published regularly, although it is recognised that this is a challenge for many public accounting systems. The

same protocols for decision-making on the direct use of state resources should apply to guarantees as well. This is likely to involve the use of explicit fees reflecting their market value, so as to avoid implicit subsidies.

Application in South Africa

Sophisticated scheme for managing contingent liabilities is in place

South Africa has in place a sophisticated scheme for managing contingent liabilities. The legal framework requires that the Minister of Finance approve all guarantees and indemnities, just as he must with conventional debt. As part of the framework, an appropriate system for credit administration, measurement, monitoring, and control around guarantees must be maintained. This is backed by high-level political support for limiting the issuance of guarantees, levying fees to equalise their perceived benefits and true borrowing costs, and encouraging entities to borrow on the strength of their own balance sheets and not that of the government.

Principle of optimal management of contingent liabilities applies

The principle of optimal management of contingent liabilities applies. This includes assessing the credit risk of the guaranteed entity, monitoring concentrations of risk, adhering to a limit for total liabilities, and having a holistic view of all contingent liabilities. By principle, guarantees are issued only where appropriate risk management procedures exist, legislative requirements have been met, legal advice has been sought, time limits and termination clauses apply, there is a maximum limit on claims, and there is a demonstrable need for the government to accept such risks.

Applicants for guarantees must supply information

Applicants for guarantees, typically state-owned enterprises, must supply information to the treasury. This includes the rationale for the guarantee (that is, how achieving its corporate plan will be enhanced with the guarantee in place), the proposed amount required, the use of the guaranteed funds, the repayment schedule and maturity of the underlying debt, and financial data from past years and projections for future years. A fee regime applies, the objective of which is to ensure that financially stable state-owned enterprises find borrowing with a guarantee more expensive than borrowing without one, and that less financially stable firms find borrowing too

expensive without a guarantee. The fee itself includes a guarantee fee payable annually, based on the nominal value of the underlying debt, and an administration fee payable up-front.

Contingent liabilities framework has reporting requirements

The contingent liabilities framework also has reporting requirements. A register of guarantees is maintained, and recipients of guarantees must supply updated information to the treasury on a quarterly basis. New figures are compared with previous figures to ensure completeness and accuracy, with deviations investigated. The register itself is subject to annual audit. Comprehensive information on the portfolio of guarantees is reported publicly in the government's accounts. Future work in respect of guarantees includes reviewing the appropriate level of contingent liabilities, measuring and managing the contingent liabilities of public-private partnerships and implementing information delivery enhancements.

V. Policy recommendations and priorities

Sound debt management is a key component of a correct policy mix

African countries are diverse in terms of their debt situation, debt management practices, and government securities markets. Sound debt management is a key component of a correct policy mix. Debt management alone cannot solve macroeconomic imbalances or structural problems, but an appropriate debt level and debt structure can contribute to reducing vulnerabilities.

Challenges in implementing sound debt management practices and developing domestic government securities markets are especially acute for Africa

African countries face a number of challenges in implementing sound debt management practices and developing liquid domestic government securities markets. These challenges are shared with other emerging market countries but, in many cases, are especially acute for Africa. The structure of outstanding debt is complex. Volatility in the macroeconomic environment is high, and economies lack natural stabilising structural characteristics that allow the use of effective counter-cyclical policies. Many countries are still subject to original sin and currently have limited scope to benefit from international risk-sharing. As a consequence, debt managers in Africa face greater and more complex risks in managing their public debt portfolios and executing their funding strategies.

Adopting a risk-based approach would be an important innovation...

Adopting a risk-based approach to debt strategy and debt management operations, however, would be an important innovation. Such an approach supports achieving strategic debt targets based on transparent benchmarks, managing public debt in an integrated manner, and assessing costs and risks to provide information for decisions regarding an optimal debt structure and a sustainable debt position.

...with implications for both primary and secondary market operations

This approach has implications for both primary and secondary market operations. For the primary market, it encourages market-based issuance of government securities at optimal maturities and with an optimal mix of domestic versus external funding, the predictable issuance of benchmark bond lines, the development of a wide and diversified investor base, and potentially the use of a primary dealer system. For the secondary market, it encourages the development of liquid benchmark bond lines along the yield curve, including out to long maturities, with liquidity boosted by a diverse community of investors and intermediaries. The establishment of interest rate and currency benchmarks would help improve the transparency, predictability, and liquidity of the wider domestic fixed income market, with government securities providing both pricing references for other financial instruments and tools for interest rate risk management.⁷

Debt strategy should emphasise the importance of risk management...

Formulating and implementing a debt strategy is a significant analytical and communication exercise. It is complicated in much of Africa by wide fluctuations in macroeconomic and fiscal variables. The range of funding sources is often narrow, and discretion may be limited in terms of the risk characteristics of new debt. It may be helpful to frame the objective as one of minimising risk subject to cost considerations, as opposed to the more typical formulation of minimising cost subject to risk as one way of emphasising the importance of risk management as an integral part of debt management.

...incorporate all debt...

A good start, however, would be to codify the existing implicit debt strategy, identify the most critical and significant risks first, and then make incremental steps toward managing and reducing them. Over time, it should be possible to develop a more integrated strategy that incorporates domestic and external debt, contingent

liabilities, and related financial assets such as on-lending. It is important to present policy choices to decision makers in a way that is simple and straightforward, but analytically robust and convincing. The sophisticated modelling techniques used by some debt managers in the OECD area and in other emerging market countries are not a prerequisite for doing that.

...and encourage debt sustainability

Debt sustainability depends in part on ensuring that the funds raised are used for high-quality investment. This raises the issue of how to create an effective policy environment for addressing the appropriate level of debt, public investment, budget balance, and so on.

Reporting requirements should be strengthened

More timely and reliable data, as well as reporting, on the stock of debt and guarantees is required. For guarantees especially, the data are often completely lacking. Greater control over guarantees depends on securing political will.

Legal reforms are needed

In terms of institutional issues and problems, while the authority to borrow is generally adequately defined in African countries, there are serious weaknesses around transparency, accountability arrangements, and the requirement to develop a debt strategy. Legal reforms are needed.

There is a need to develop human capacity, both externally and internally

There is a need to develop human capacity, both externally and internally, to move forward. The former includes sensitising policy makers about the importance of good debt management. The latter includes finding solutions to problems in recruiting and retaining staff with the appropriate skills to carry out debt management in a professional manner, as well as securing training and technical assistance on, among other aspects, debt strategy formulation and implementation that is consistent with macroeconomic reform and long-term risk-based debt sustainability. Currently, it often falls to central banks to perform debt management functions, which complicates debt management, as well as monetary, fiscal, and macroeconomic policy. There is a need for high-level political leadership and sustained commitment to move to more professional debt management in African countries.

International organisations have a role to play in strengthening debt management in Africa

There is a role for international organisations to do more to strengthen capacity for professional debt management in Africa, while ensuring that the activities of the individual institutions complement, and not duplicate, one another. In this context, it was suggested to circulate at future OECD forum meetings on Africa the critical elements of the work programmes of international and regional organisations involved in debt management and bond markets in Africa. This was welcomed by African officials, arguing that this would strengthen co-operation among the OECD, IMF, World Bank, African Development Bank, Commonwealth Secretariat, and other organisations.

Notes

1. Hans Blommestein and Greg Horman, *Public Debt Management and Bond Markets in Africa*, OECD, Paris, forthcoming. Some of the data prepared by the authors for the study and highlighted in this article also appear in OECD Development Centre and African Development Bank (2007), *African Economic Outlook*, OECD, Paris.
2. The forum is part of the non-member outreach activity of the OECD Working Party on Debt Management and was sponsored by the Swedish International Development Co-operation Agency (SIDA). It is one component of a wider project whose main objective is to develop a policy dialogue with African debt managers. The purpose of the annual forum is to acquaint senior debt managers and other financial officials involved in public debt management and government securities markets in African countries with OECD best practices. The forum focuses on specific problems, issues, and debt management policies of particular relevance to African countries. It provides African debt management officials the opportunity to link up with the global network of debt managers and to exchange ideas and experiences with peers from the region, OECD members, and other developing countries. The OECD works in consultation with the IMF, World Bank, and other agencies in preparing the agenda so as to complement their technical assistance activities.

3. The regional workshops are one component of an OECD policy dialogue with African countries on public debt management and government securities markets. They follow, but are distinct from, the OECD Forum on African Public Debt Management (like the one held in Amsterdam in December 2006). The forum in Amsterdam focused on strategic policy issues, whereas the emphasis of the regional workshop in Johannesburg was on operational and technical aspects of interacting with and developing markets. The workshops provide African debt management officials the opportunity to exchange practical ideas and experiences with peers from the region. The initiative for these complementary workshops came from the African participants themselves.
4. The working party has as an objective to create awareness of the major policy issues in developing sound debt management policies and to share and learn from country case studies and practices. In this way, debt managers from emerging markets become better acquainted with OECD policies, techniques, and experiences in the field of public debt management and government securities markets.
5. OECD Development Centre and African Development Bank (2007), *African Economic Outlook*, OECD, Paris.
6. Lars Hørngren *et al.* (2005), “Explicit Contingent Liabilities in Debt Management,” *Advances in Risk Management of Government Debt*, Hans Blommestein (ed.), OECD, Paris.
7. Hans Blommestein (2007), “A New Strategy for Developing African Bond Markets,” presentation for the G7 High-Level Workshop on Developing Bond markets in Emerging Market Economies, Frankfurt, 9-10 May 2007.

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