



Financial Market Trends



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Foreword

This publication appears twice a year with each issue providing a brief update of trends and prospects in the international and major domestic financial markets of the OECD area.

The main part of the publication focuses on analyses of, and statistics and charts on, financial matters of topical interest or longer-term developments in specific sectors of the international markets or major domestic financial markets. Periodically, a small number of articles within one field of financial sector developments, constituting the so-called “special focus” for the particular issue, may be included. Within the realms of the special focus – or on other topics of general interest – external contributors from relevant organisations in OECD member countries may occasionally be invited to contribute.

Queries concerning the contents of the bulletin should be addressed to the Financial Affairs Division of the OECD Directorate for Financial and Enterprise Affairs (tel.: +33 1 45 24 91 27, +33 1 45 24 15 34 and +33 1 45 24 96 61).

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The cut-off date was 23 October 2006

Conventional signs:

.. Not available \$ US dollar

– Nil

Discrepancies in totals are due to rounding

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Achevé de rédiger le 23 octobre 2006

Légendes :

.. Donnée non disponible \$ dollar des États-Unis
 – Néant

Les chiffres ayant été arrondis, leurs sommes ne correspondent pas toujours aux totaux

Highlights of Recent Trends in Financial Markets

I. Overview

After some significant corrections in the second half of May and in early June, major equity markets have resumed their growth, in some cases regaining levels reached before the May-June contraction. Against a backdrop of healthy corporate balance sheets, robust earnings growth and low default rates, investor sentiment has remained positive, as reflected in these equity market developments and compressed credit spreads. However, there are signs of increasing nervousness, which include the May/June market turbulence and somewhat increased levels of historical and implied volatility. The increased nervousness may reflect in part downward revisions to economic forecasts.

After some major corrections in May and June, equity markets recovered well and despite heightened uncertainty, sentiment in corporate bond markets remained positive.

While central banks have continued to withdraw liquidity, short-term interest rates have been rising but such increases have not been fully matched at the long end. As a result, government benchmark bond yield curves have flattened a bit further. In corporate bond markets, after the turbulence earlier in the year spreads have either moved broadly sideways or declined. Viewed over the whole period since the last meeting, these spreads have risen somewhat, but they remain at relatively low levels. With some exceptions, emerging market bond spreads also remain at relatively low levels, even if they have increased from their historical lows.

In the light of a weakening economic outlook, yield curves flattened as central banks continued to withdraw liquidity.

II. Equity markets

*The equity market
downturn in May
and June wiped out
gains made over
the previous
months...*

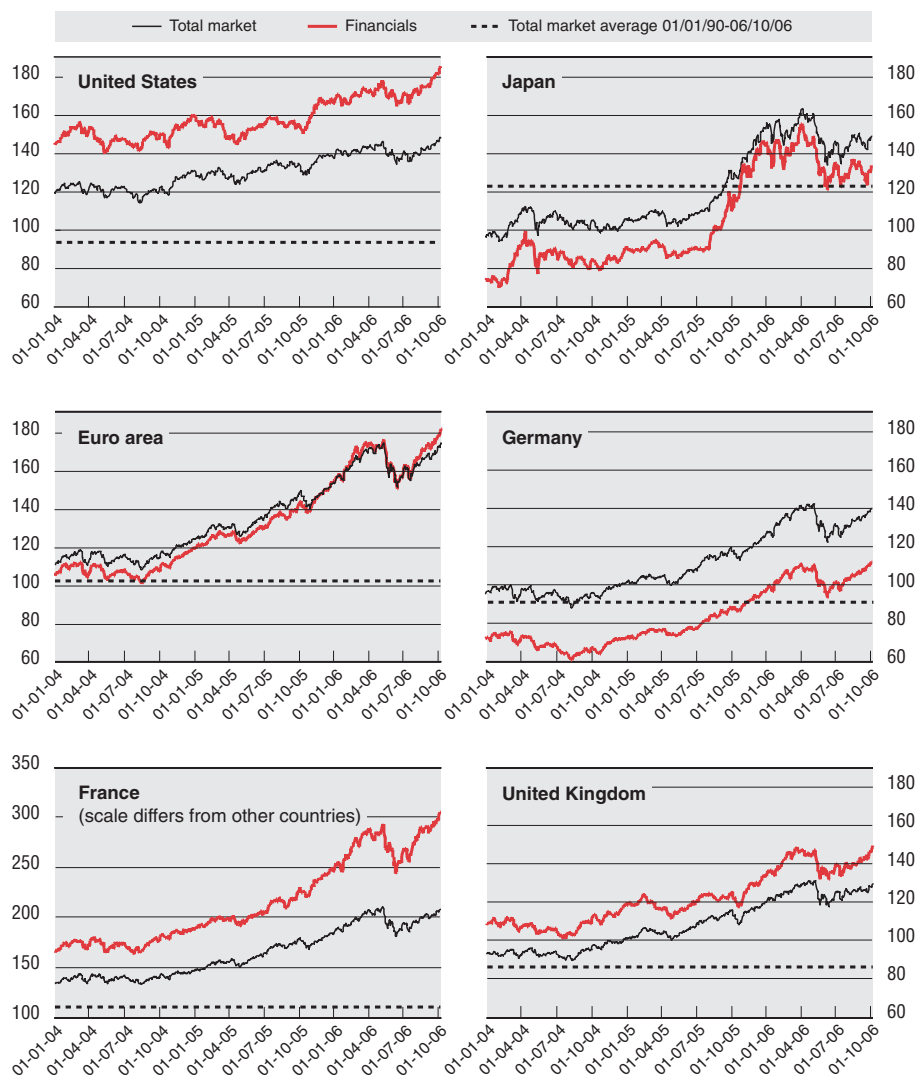
In May and early June, equity markets across the globe experienced major corrections amid investors' fears of increasing inflation, higher interest rates and in some cases slowing growth prospects (Figure 1). As a result, some major markets dropped back to levels that they had reached in the last quarter of 2005, which for some of them implied losses of up to around 20 per cent from their recent peaks. Those losses were particularly steep in markets where strong gains had been recorded previously, like in Japan or the euro area. Cumulative declines in the Japanese broad market index brought the index on June 13 to its end-of-October 2005 level, a decline of over 20 per cent from its peak on 9 May. The euro area broad market index fell more than 17 per cent over the same period, falling back to January 2006 levels. For the US broad market index, the corresponding loss was slightly less than 9 per cent, but the decline nevertheless wiped out within a few days gains that had been-made since the previous November.

*... and volatility
increased over fears
of weakening
economies,...*

In the course of these downward adjustments, volatility of major indices increased substantially, breaking through long-term averages (measured from the beginning of 1990 to date), and continued to rise even after markets had started to regain some strength (Figure 2). Volatilities subsequently receded only in July and August, but have remained above their pre-correction levels of early May, indicating some heightened uncertainty on the part of investors about the future direction of equity markets. The fact that for all major indices historic volatility, a backward-looking measure, has remained well below implied stock market volatility, a forward-looking measure (based on option contracts), corroborates this view.

Figure 1. Major stock markets

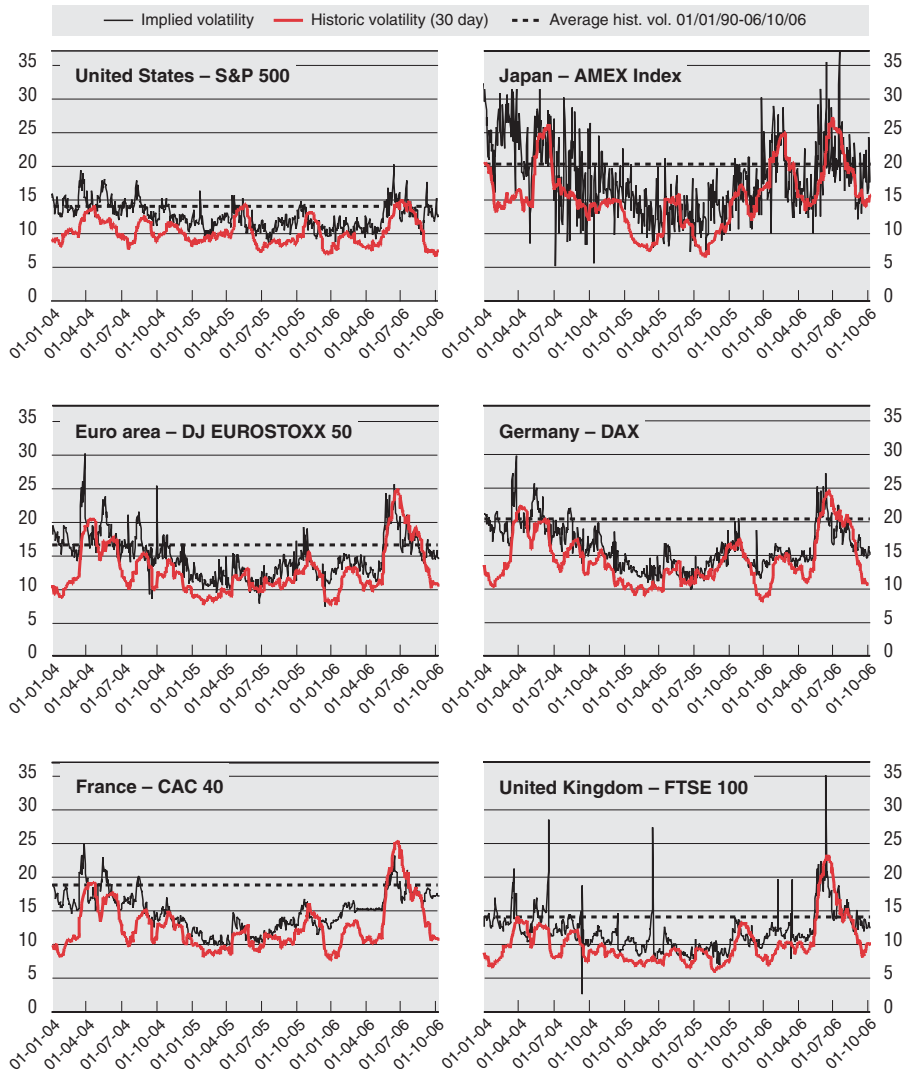
Total market and financial sector equity price indices, 1 Jan 1998 = 100



Note: Datastream indices. Daily data until 6 October 2006.

Source: Thomson Financial Datastream.

Figure 2. **Stock markets: implied and historic volatilities**



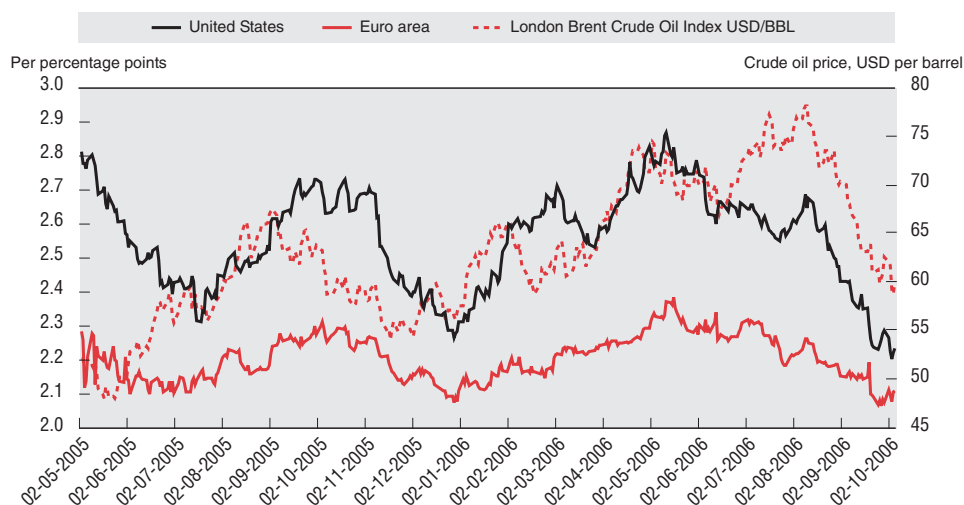
Note: Daily data until 6 October 2006. Historic volatilities are monthly volatilities calculated from daily data. Implied volatility can be interpreted as market expectation of risk (future volatility) and is derived from at-the-money call option prices (interpolated) using the Black-Scholes formula. The Cox-Rubinstein binomial method is used for American style options.

Source: Thomson Financial Datastream.

Nonetheless, since the May-June correction, equity markets have resumed their upward path and many major equity price indices have regained levels attained before the downturn. Such developments have been supported by positive earnings reports and a favourable growth outlook for the euro area and Japan as well as a drop in oil prices, which relieved some concerns among market participants about upward pressure on inflation. In the course of the oil price decline, inflation expectations, as measured by the difference in yields of nominal and inflation-indexed bonds, fell back (Figure 3). On the basis of the improving output-inflation trade-off, some market participants adopted the view that the Fed would be more at liberty to support an expected slowing US economy. In Europe, the recent rise of the ECB's policy rate early in October was viewed favourably, supporting a jump in share prices to five-year highs. Financial markets shrugged off the recent increases in oil prices early in October, following OPEC's announcement of possible cuts in production, but it cannot be excluded that risks of higher and volatile oil prices remain.

...but markets have resumed their growth path over the past few months,...

Figure 3. Implied inflation expectations and crude oil price



Note: Daily data until 6 October 2006. 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.

Table 1. Overall and sectoral stock market performance in major economies

	United States	Japan	Euro area	Germany	France	Italy	United Kingdom	Canada
<i>Broad stock market indices</i>								
	WILSHIRE 5000	NIKKEI 225	DJ EURO STOXX	DAX 30	CAC 40	MILAN MIBTEL	FTSE 100	S&P/TSX COMP.
Pct.chg. Dec. 05-Oct. 06	6.1%	4.0%	13.3%	13.0%	11.8%	10.9%	7.6%	4.6%
P/E Oct. 06 ^b	17.5	27.2	15.1	14.0	14.1	16.1	13.6	14.6
P/E avg. Jan. 90-Oct. 06 ^b	21.2	47.6	16.2	16.8	15.2	19.0	17.0	18.9
<i>Telecom, Media, IT^a</i>								
Pct.chg. Dec. 05-Oct. 06	5.7%	0.3%	1.2%	-2.5%	-5.3%	-7.4%	3.3%	16.4%
P/E Oct. 06	24.6	27.7	17.6	19.8	13.7	17.0	14.8	29.3
P/E avg. Jan. 90-Oct. 06	29.2	60.6	21.7	30.9	19.4	21.1	23.7	28.5
<i>Financial^a</i>								
Pct.chg. Dec. 05-Oct. 06	10.1%	-6.9%	18.8%	17.1%	23.3%	18.8%	12.4%	8.3%
P/E Oct. 06	14.2	23.0	13.7	12.4	12.8	17.9	13.5	14.4
P/E avg. Jan. 90-Oct. 06	15.3	61.2	15.7	18.8	12.5	20.3	16.5	13.7
<i>Of which: Banks^a</i>								
Pct.chg. Dec. 05-Oct. 06	9.2%	-7.5%	19.9%	16.8%	25.9%	22.2%	9.6%	9.7%
P/E Oct. 06	13.8	18.8	14.0	11.0	11.9	17.2	11.9	13.2
P/E avg. Jan. 90-Oct. 06	14.2	93.8	13.3	13.6	10.8	16.2	14.1	13.1
<i>Insurance Companies^a</i>								
Pct.chg. Dec. 05-Oct. 06	4.4%	3.1%	14.2%	16.0%	14.5%	7.2%	13.6%	4.2%
P/E Oct. 06	12.0	34.6	12.3	11.5	11.1	17.1	12.2	14.6
P/E avg. Jan. 90-Oct. 06	17.4	43.8	20.6	32.7	13.8	29.4	18.8	13.9
<i>Life insurance companies^a</i>								
Pct.chg. Dec. 05-Oct. 06	5.5%	8.8%	13.5%	13.8%	13.7%	-3.6%	12.8%	3.9%
P/E Oct. 06	14.4		12.1		8.5	19.9	12.0	15.1
P/E avg. Jan. 90-Oct. 06	14.8		24.9		10.1	37.3	19.3	15.0

Note: Calculations based on monthly averages (October 2006 data are until 6 October only). Earnings per share, the denominators of the price-earnings ratios, are based on the latest annualised rate reflecting the last financial year or derived from an aggregation of interim period earnings. For France, the current earnings per share are a forecast provided by local sources. For the United Kingdom, the earnings are calculated by a rolling 12 months method of analysis based on interim, final and annual accounts.

a) Datastream indices. The Insurance index includes non-life insurance companies, insurance brokers and other insurance companies; it does not include life insurance companies.

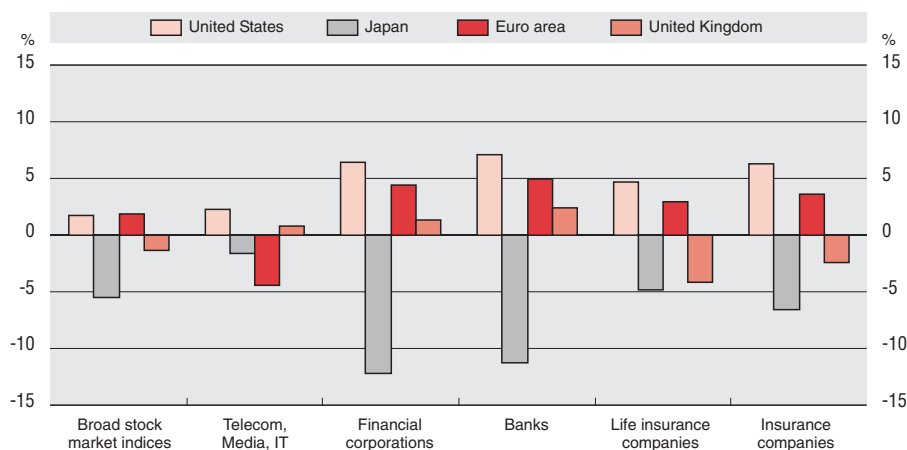
b) From Datastream Total Market indices.

Source: Thomson Financial Datastream.

**...with little evidence
of overvaluation, as
fundamentals have
remained broadly
unchanged.**

Looking at price-earnings (P/E) ratios of major indices, there is little indication that share prices are overvalued (Table 1). The P/E ratios of all G7 broad stock market indices and those of almost all sectoral indices are below their long-term averages (measured from the beginning of 1990 to date), despite the strong growth of some major indices. For example, most of the

Figure 4. **Recent sectoral stock market performance in major economies**
Percentage changes from April until October 2006



Note: Calculations based on monthly averages. Indices as specified in Table 1.

Source: Thomson Financial Datastream.

European indices have grown over 10 per cent over the year to date. This corroborates the temporary nature of the May-June correction on equity markets and the positive investors' sentiment thereafter which put share prices back on a growth track.

Financial sector indices outpaced the broader market in all G7 economies except in Japan, where the negative performance of banks dragged the financial index down. Despite the positive performance of the insurance sector since the beginning of the year, over the past six months also this sector also showed a negative performance (Figure 4). Facing rising refinancing costs and often locked in at low long-term returns, many Japanese banks are bearing the costs of adjustment to the Bank of Japan's new regime. By contrast, euro area banks have been the best performers over the year to date, as reflected in a rise in the euro area banking index of almost 20 per cent (Table 1). However, more recently, as measured over the past six months, the US banking index outpaced its G7 peers with a gain of almost 10 per cent growth. However, flattening yield curves and a cooling housing market may put more pressure on banks in particular in the US, where they have also taken on sizable exposures to the household sector by issuing more non-traditional mortgage instruments and extending loans to sub-par borrowers.

The G7 financial sectors performed well, but bank indices in Japan declined, and while growing strongly elsewhere banks may come under pressure from flattening yield curves and a cooling housing market.

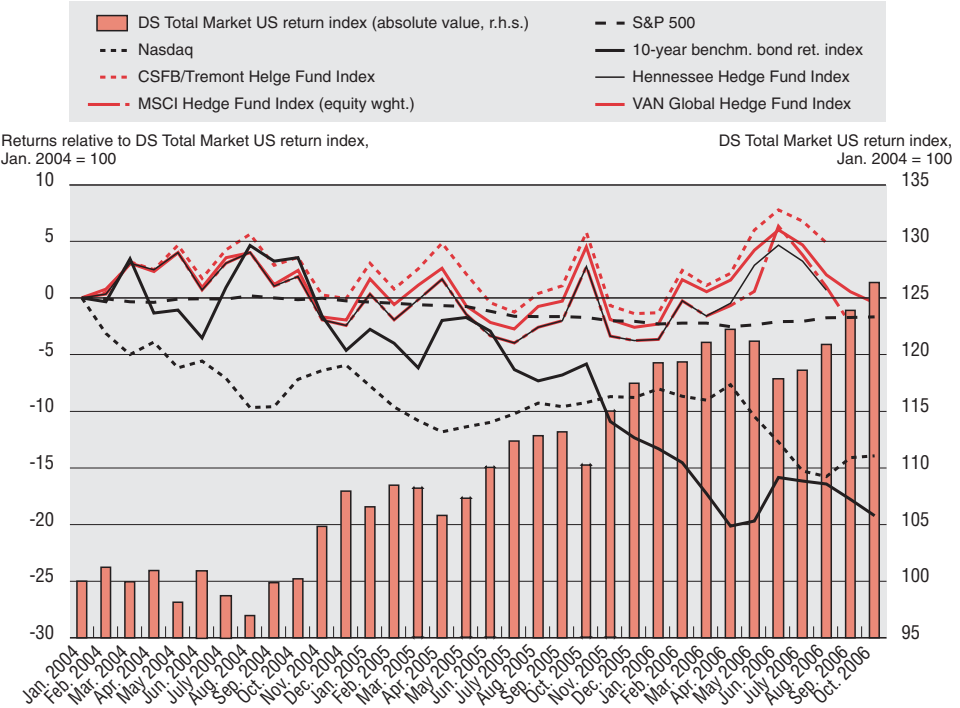
After a difficult previous last year the US insurance sector has fared much better.

The US insurance sector, which had suffered from the hurricane season last year (and the New Orleans disaster in particular), seems to have come out well through this year's more benign heavy weather season, improving their balance sheets through higher insurance charges, which reflect the previous heavy damages, and also due to the fact that more homes are being built along the costal danger zones which require higher insurance.

Hedge funds performed well during the equity market decline.

The run on hedge funds which was particularly strong last year has been slowing, but hedge funds continue to be popular investments. They have weathered the storm of stock market declines in May and June by benefiting from heightened volatility, and thus outperformed other investments during that period (Figure 5). Also, market observers

Figure 5. **Relative performance of US securities and hedge funds**
Returns relative to broad market (DS total market index 2004 = 100)



Note: October 2006 data are based on averages until 6 October.
Source: Thomson Financial Datastream.

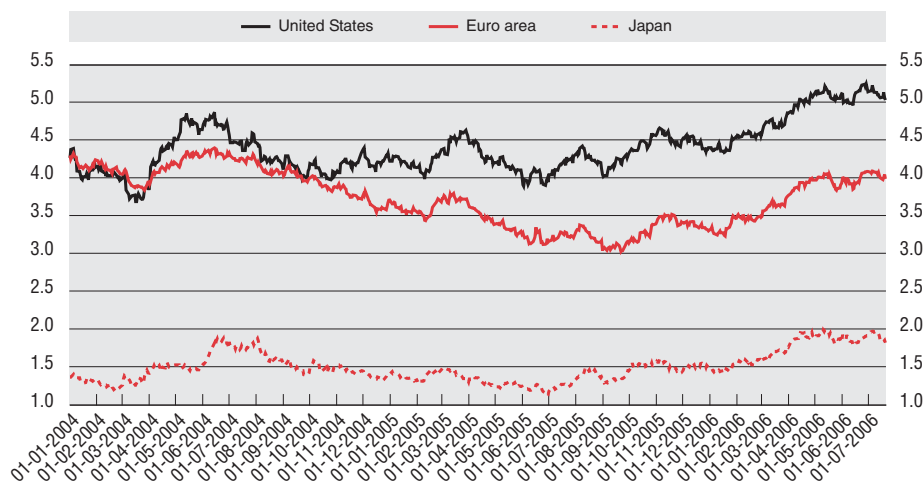
reported that there were no signs of crowded trades during the downturn and they were also relaxed about the risk that hedge funds might need to sell into a falling market in the event that margins calls could urge them to raise collateral for risky investments. Hedge funds' performance was less favourable more recently, and correlation with equity market indices declined as stock market volatility eased.

III. Bond markets and interest rates

Bond markets have been driven by uncertainties over the economic outlook and expectations regarding the reaction of major central banks to inflationary pressures. The upward trend of major benchmark bond yields which had started early this year was halted by developments around the equity market correction in May and early June (Figure 6). The equity market sell-off led to bidding up of bond prices as investors looked for safer assets. As a consequence, in the course of a month, from around mid-May to mid-June, major benchmark bond yields dropped around

Bond markets have ebbed and flowed on account of increased uncertainties about the economic outlook,...

Figure 6. 10-year government benchmark bond yields



Note: Data are of 6 October 2006.

Source: Thomson Financial Datastream.

20 basis points. Bond market volatility has remained low overall. While volatility dropped slightly for US and euro area benchmark bond returns, it increased for the Japanese benchmark yield.

*...weighing the
impacts of a cooling
housing market
versus those
of increasing oil
prices ...*

Much of the uncertainty over the outlook for growth and inflation that affected the long end of the yield curve was driven by the uncertainties concerning the impact of a cooling US housing market, which some expected to pull down consumer spending and weigh on the US economic outlook. At the same time, inflationary pressures have been building up as previous oil price increases have been creeping into core inflation. As well, there are some arguments that an inverse relationship between house prices and rents could put upward pressure on the CPI through rental costs if house prices fall or increase more slowly.¹ But, empirical evidence on such an effect is not conclusive. Rather, it seems that at times there has been a lagged positive relationship between house prices and the CPI, implying that a cooling housing market would have dampening effects on consumer price inflation and, in that event, on long-term interest rates.

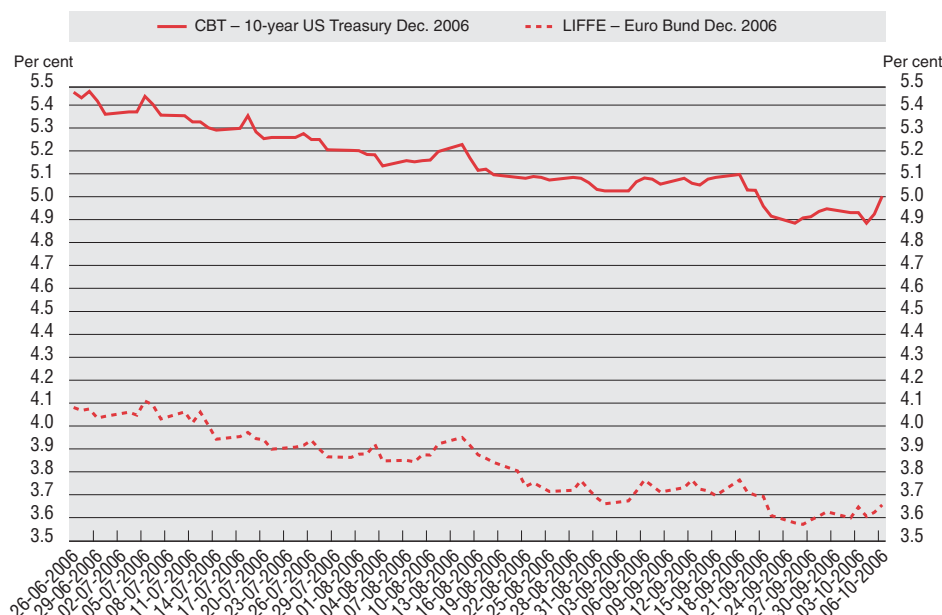
*...and driving down
long-term interest
rate expectations,...*

For both the US and the Euro area, a bullish bond market sentiment has driven down expectations on long-term bond yields over the past few months (Figure 7). December futures for 10-year US Treasuries declined about 50 basis points over the past four months, and a decline of similar magnitude has been observed for Euro Bund futures. These movements are in line with downward revisions to growth and lower inflation expectations stemming from lower oil prices, but perhaps also to beliefs that central banks' would remain vigilant regarding inflation.

*...while central
banks continued to
withdraw liquidity.*

In fact, as central banks around the globe continued to withdraw liquidity (Figure 8), yield curves generally have flattened (Figure 9). In the US, while the Fed, after its last quarter point increase at the end of June, which lifted the Fund rate target to 5.25 per cent, had given indications of a pause in future tightening moves, the ECB after its rise of the repo rate to 3.25 per cent early in October, raised speculation as to a further upward move in December. Expectations on US short-term interest rates, as implied by forward rates and future contracts,

Figure 7. Changes in interest rate expectations in major markets
Long-term interest rate futures, December 2006 contracts



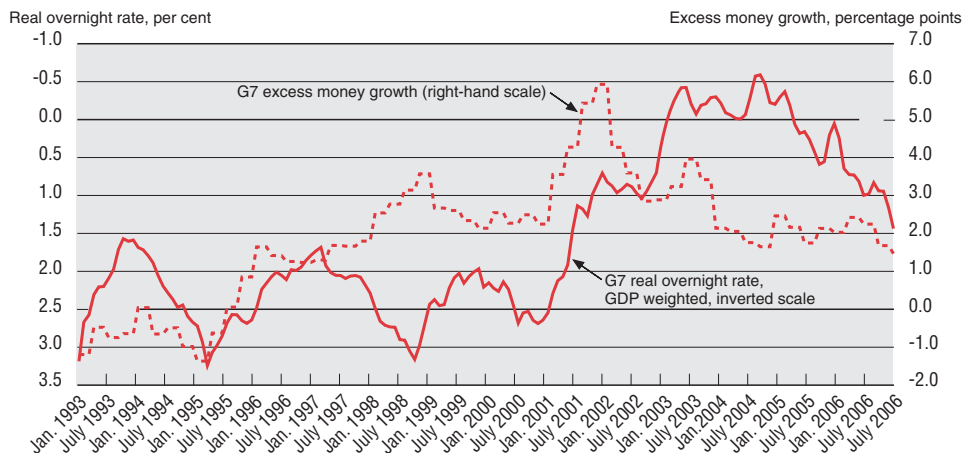
Note: Daily as of 6 October 2006.

Source: Thomson Financial Datastream.

point to some monetary easing by the Fed next year (Figure 10). Conversely, judged by the same measures, investors expect some further tightening by the ECB by the end of this year. For next year, expectations are basically flat for euro area short-term interest rates. In Japan, where the BOJ ended its monetary easing policy in May, expectations regarding interest rates are more volatile. While expectations on future short term interest rate moves have been pointing upwards, they have dropped substantially over the past few months. In the United Kingdom, where the Bank of England increased its policy rate to 4.75 per cent early in August, there are no strong expectations as to future rate increases. In Canada, expectations for Canadian short-term interest rates point downwards for the next year, echoing sentiment in the United States. Such expectations would imply that, after the Bank of Canada had raised its call rate to 4.25 per cent at the end of May, tightening would have come to a halt for some time ahead.

Figure 8. Proxies for global liquidity developments

G7 real overnight rate, GDP weighted; inverted scale, and actual money growth minus potential real GDP growth, in percentage points



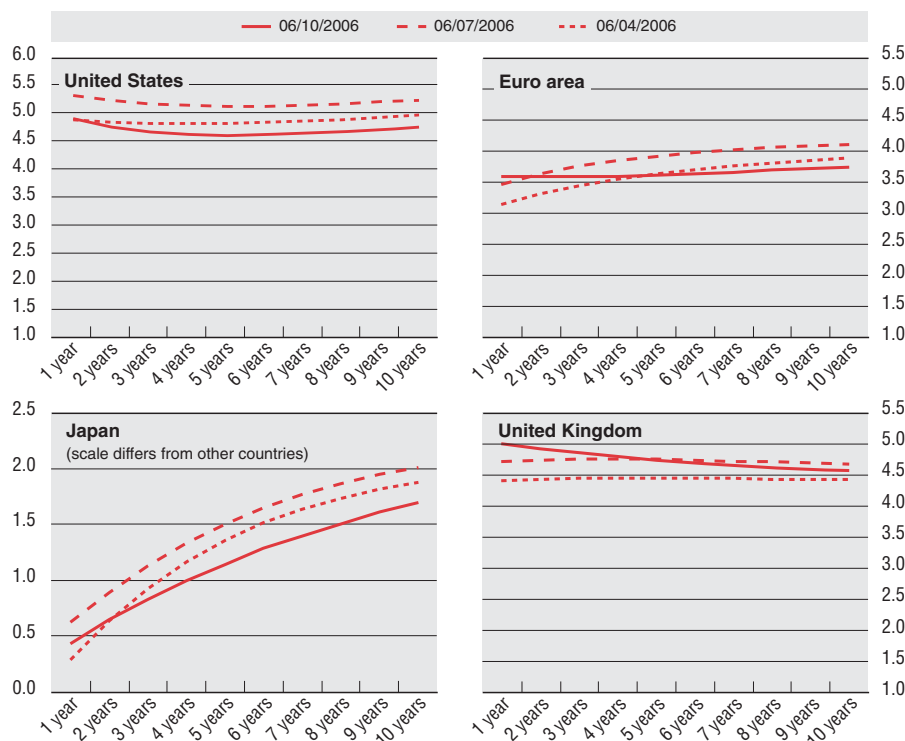
Note: The global liquidity indicator based on real interest rate developments follows C. Borio and W. White (2004), "Whither monetary and financial stability? The implications of evolving policy regimes", BIS Working Paper No 147. The measure shows a weighted average of real overnight rates in G7 countries; for France and Germany, the Euro Overnight Index Average (EONIA) is used from 1999 onwards. The weights are based on USD GDP, and real rates are calculated by deducting three-month moving averages of year-on-year CPI changes from nominal overnight rates, including projected CPI changes in cases where most recent data have not yet been available. The other indicator focuses on G7 excess money growth (again as GDP-weighted average). Actual nominal money growth is the year-on-year growth of quarterly broad monetary aggregates; potential real GDP growth is corrected for trend velocity growth, i.e. it is a residual money growth measure derived from the quantity equation assuming zero inflation. Trend velocity growth is based on average velocity growth 1980-2002 in the respective economies, except for the euro area, where it is based on the mid-value of the range for velocity growth as assumed by the European Central Bank in deriving the quantitative reference value for monetary growth (0.75).

Source: Thomson Financial Datastream.

**Credit markets
reflected a positive
sentiment...**

Credit markets seemed to have continued to reflect a positive investors' sentiment. In the wake of the equity market sell-off in the second half of May and early June, corporate spreads have risen somewhat both in the United States and the euro area. But spreads of investment-grade over benchmark bond yields are still hovering around their 5-year averages in the United States, and have remained below such averages in the euro area (Figure 11). High-yield spreads are well below their 5-year averages on both sides of the Atlantic, and investment-grade as well as high-yield spreads have eased somewhat more recently (Figure 12).

Figure 9. Yield curves



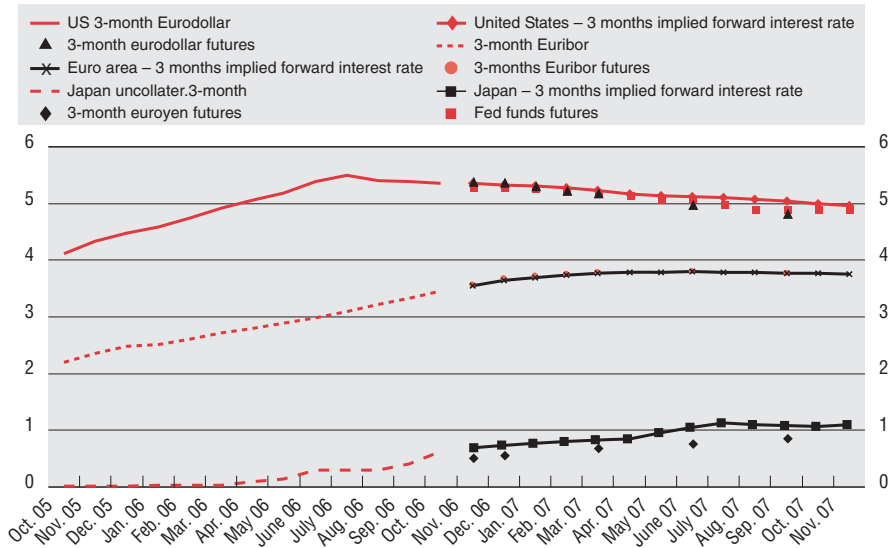
Note: Monthly averages of daily data.

Source: Thomson Financial Datastream.

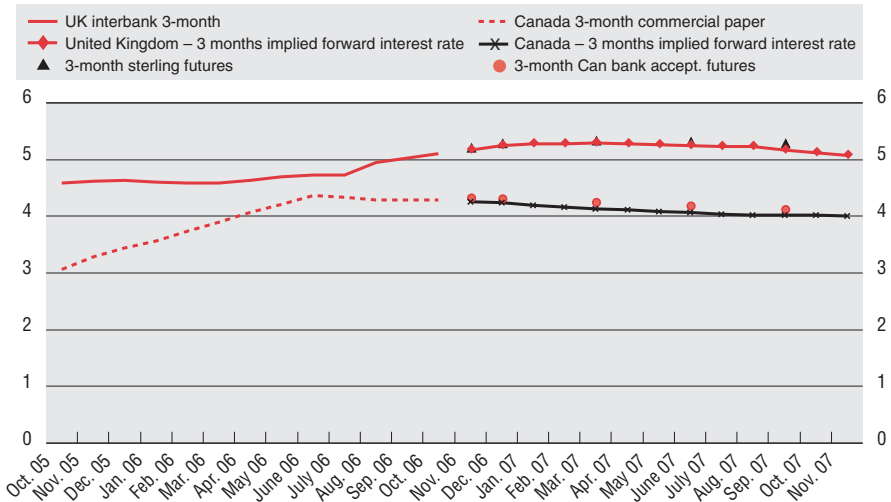
Investors have remained positive and apparently have not yet viewed the credit cycle as nearing a turning point. Default rates have been declining on a global level (Figure 13), and downgrade ratios have been low. However, looking ahead, default rates are forecast to slightly increase in the near future, and downgrade ratios have already been rising over the past two quarters in the United States as well as in Europe.² Nonetheless, with more companies on the downgrade watch list than in 2005, many observers expect the credit quality to deteriorate further for US and euro area companies. In the United States, the risks are related to the expected cooling in the economy, and in Europe, the rising wave of mergers and acquisitions may overextend some borrowers' capacities.

...but credit spreads, while still low, have edged up, suggesting some more risk aversion.

Figure 10. Implied forward and futures short-term interest rates
a) United States, euro area and Japan



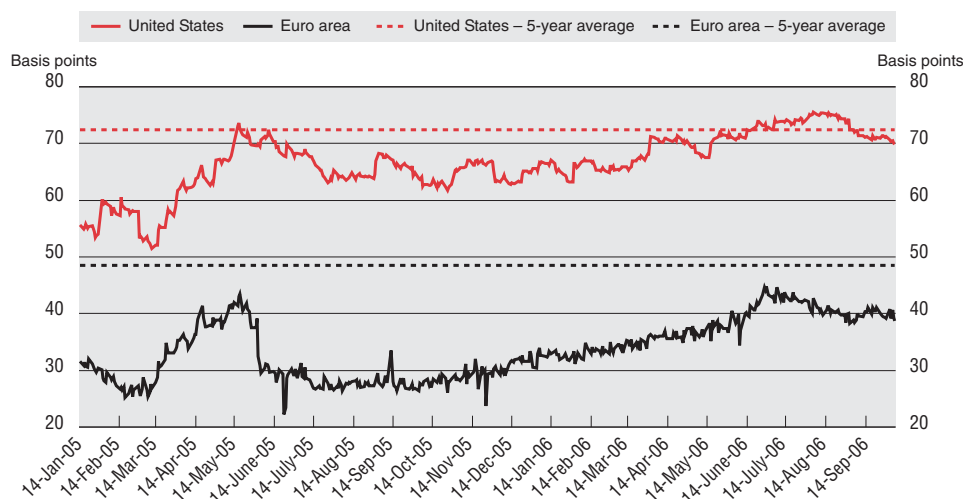
b) United Kingdom and Canada



Note: Data as of 6 October 2006. Actual rates: United States: 3-months eurodollar middle rate; euro area: Euribor 3 month offered rate; Japan: uncollateral. 3-month middle rate; United Kingdom: Interbank 3-month offered rate; Canada: commercial paper 3-month middle rate; monthly averages. Implied forward rates are derived from zero-bond yield curves. Eurodollar futures: 3-month (CME); Euribor futures: 3-months (LIFFE); United Kingdom: 3-month sterling futures (LIFFE); Canada 90-day bank acceptance futures (ME).

Source: Thomson Financial Datastream.

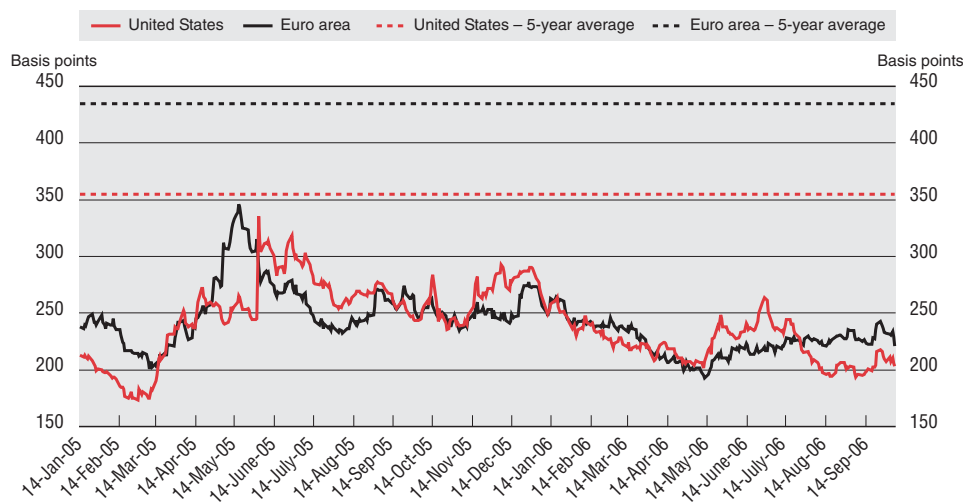
Figure 11. Investment-grade corporate bond spreads



Note: Daily data until 6 October 2006. Aggregate 5-7 year corporate AA bond yields minus 5-7 government benchmark bond yields (Merrill Lynch indices) for the United States; and JP Morgan Maggie government spread of investment grade credit, all sectors, all maturities (5-6 yrs on average), for the euro area.

Source: Thomson Financial Datastream, OECD.

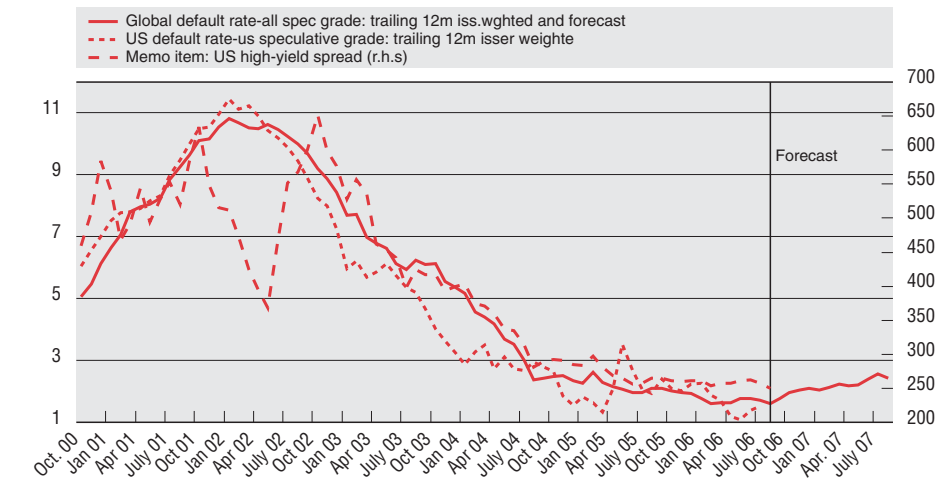
Figure 12. High-yield bond spreads



Note: Daily data until 6 October 2006. Aggregate corporate high-yield bond yields minus aggregate corporate BAA bond yields (Lehman indices) for the United States; JP Morgan Maggie government spread of high yield credit, all sectors, all maturities, for the euro area.

Source: Thomson Financial Datastream.

Figure 13. **Global corporate default outlook**
Global speculative-grade default rates, Moody's Investors Service



Source: Moody's Investors Service, Thomson Financial Datastream..

IV. Foreign exchange markets

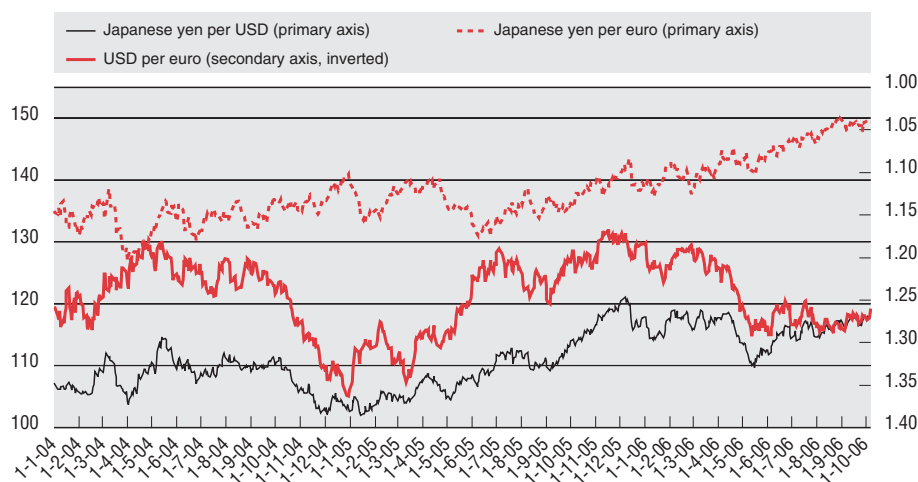
The US dollar's decline came to a halt in May,...

...benefiting from returning investors.

Changing growth and interest expectations have also been the driver for major exchange rates over the past few months. While adjustments to the high US current account deficit have put the US dollar under structural pressure and on a downward path against the euro and the Japanese yen, the May-June global equity market downturn temporarily brought and end to this trend (Figure 14). Since around mid-May the dollar started to fluctuate more widely against both the euro and the yen, and has recently moved sideways within a narrower band of variation.

In mid May, when the global equity market sell-off caused major drops of share prices around the world, the dollar was boosted by investors returning to the world's reserve currency. The fact that during this period the dollar also made strong gains against selected high-yielding currencies, like the New Zealand dollar and the South African rand, after both countries unveiled sharply higher current account deficits, was an indication for some observers that the dollar had also been benefiting from an unwinding of carry trades, many of which had been established by US-based hedge funds. After that boost to the dollar, a posi-

Figure 14. Major exchange rates



Note: Daily data until 6 October 2006.

Source: Thomson Financial Datastream.

tive outlook for the euro area and expectations of higher European interest rates again strengthened the European currency against the dollar. However, the ECB's upward moves in policy rates rather were modest in relation to some expectations of more substantial interest rate increases and of a more positive growth outlook, which took away some support for the euro.

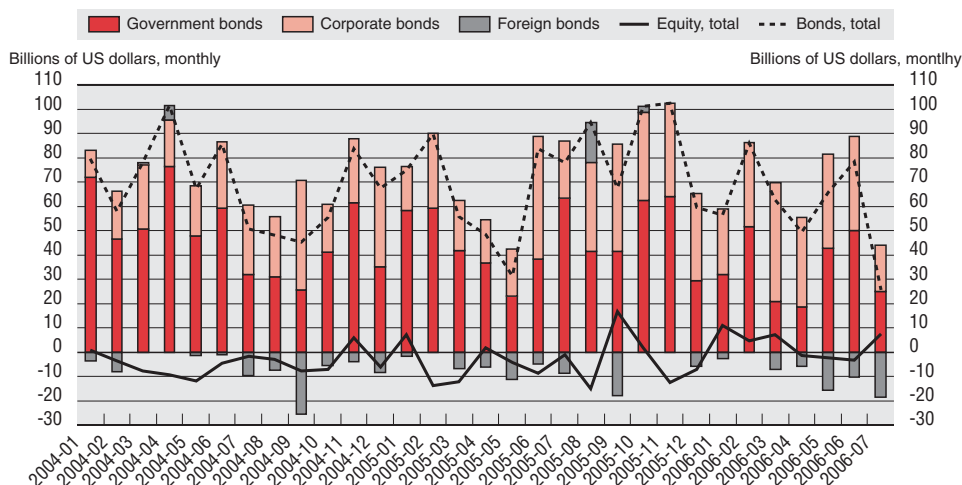
In Japan, where the economy has only slowly been recovering from deflation, and where the growth outlook has recently been revised downwards, the yen has continued to lose strength against the euro. European and Japanese officials, around the time of the G-7 meeting in mid-September, indicated that they would prefer a stronger yen against the euro. While it lent some support for the currency, this "verbal intervention" has so far not been backed up by explicit policy actions. But as some observers noted, such an officially expressed disagreement with actual exchange rate developments may increase trading risk and, thus, encourage speculative sellers of the yen to give greater consideration to the possibility of sudden movements against their position. The greater risk of sudden reversals is thought to discourage carry trades which are said to have played an important role in the recent weakness of the yen.

The yen lost strength against the euro, little appreciated by European and Japanese leaders.

Capital inflows into the US have been supporting the current account deficit,...

So far, any currency adjustments to global imbalances have been smooth, and despite a recent decline in June capital inflows into the US have been comfortably supporting the dollar in the face of an increasing current account deficit (Figure 15). With a total of over USD 855 billion over the 12 months ending in July, major foreign investments in US assets were mostly in US government bonds. Net inflows in equity increased in July, stemming somewhat against the outflow in bonds.

Figure 15. Net portfolio flows into US by category



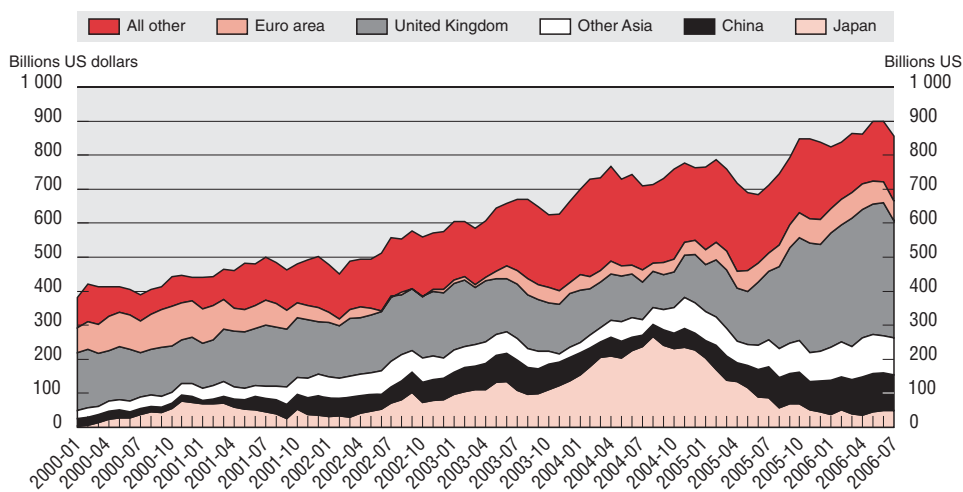
Note: Net portfolio flows are net purchases of assets by foreigners from US residents (gross purchases - gross sales). Bonds comprise US and foreign bonds; government and corporate bonds as shown here are US bonds only; equity comprises US and foreign equity.

Source: Thomson Financial Datastream.

... with inflows from China increasing.

While Japan with a share of 30 per cent is still the major holder of US treasuries abroad, other countries in the Asian region are becoming more important in this respect. Inflows from China in particular, which is currently holding about 15 per cent of US treasuries abroad, have increased substantially over the past few years, outpacing the net inflows from Japan (Figure 16). Major net inflows are still attributed to the United Kingdom, although given London's role as an international financial centre the origin of such flows is less

Figure 16. **Annualised net portfolio flows into US by region**
12-month trailing sums, billions of US dollars



Note: Net portfolio flows are net purchases of assets by foreigners from US residents (gross purchases – gross sales).

Source: Thomson Financial Datastream.

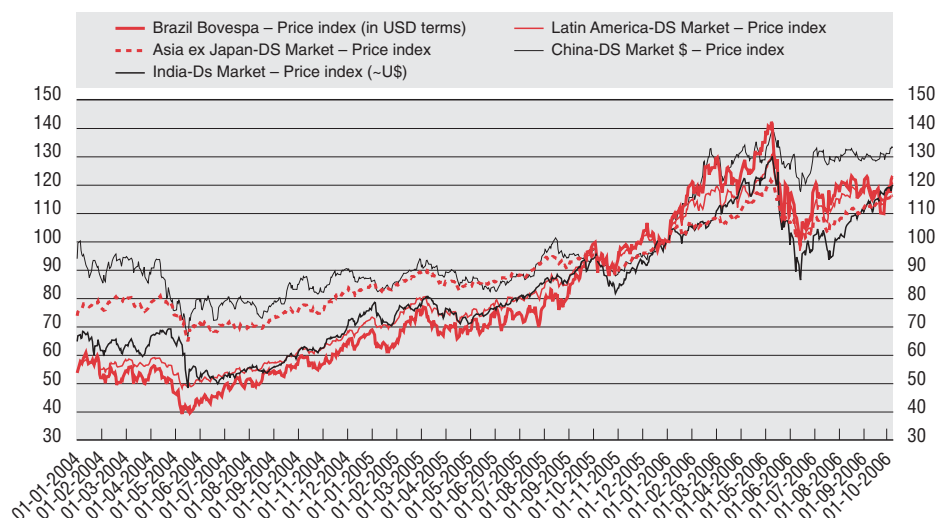
clear. There is some indication that these flows include substantial investments by oil exporters, who are investing the oil surpluses in US and other assets abroad.

V. Emerging markets

Emerging markets had been hit hard by the stock market downturn in May and June. After record inflows last year, these stock market turbulences triggered some of the biggest weekly outflows from emerging market funds in two years. The unwinding of trades by leveraged investors caused major emerging stock markets to tumble (Figure 17) and raised emerging market spreads to temporary highs (Figure 18). Among the regional equity indices shown, Latin American was hit hardest, declining over 35 per cent from its 10 May peak to a new low on 13 June. On a national level, the Indian stock market, which not so long ago profited from strong foreign investments, was hit even harder, losing almost 48 per cent over the same period, from a peak on 10 May to 13 June until. The Asian overall index (excluding Japan) declined almost 23 per cent from 8 May to 13 June.

Emerging stock markets were hit hard by the global equity sell-off in May and June, ...

Figure 17. **Stock market performance in selected emerging economies**
Equity price indices, 3 Jan. 05 = 100, in US dollar terms



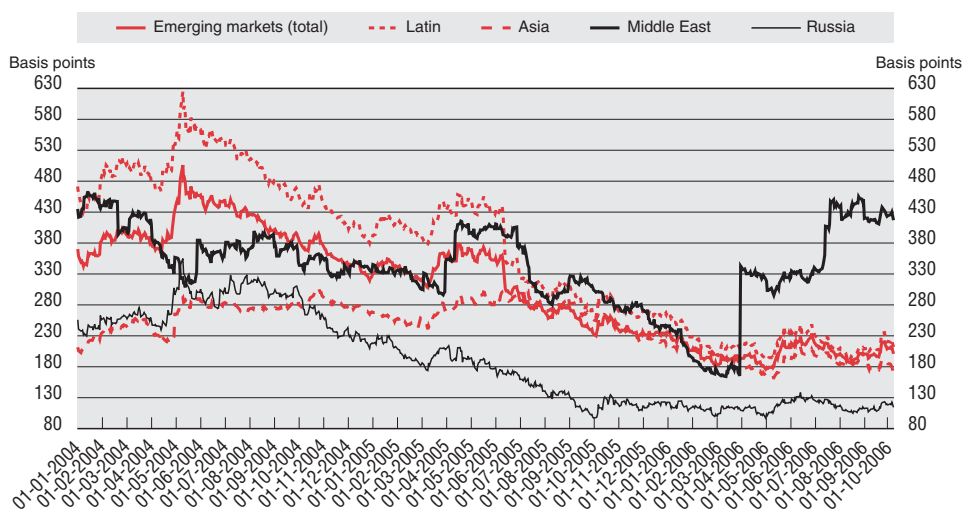
Note: Daily data until 6 October 2006.

Source: Thomson Financial Datastream.

*...but have
recovered since as
fundamentals have
remained solid...*

While these markets have not regained their early-May peaks, they have nevertheless recovered substantially. While some investors have not returned after the heavy sell-off, unchanged positive fundamentals have been supporting the markets so far. While corporate downgrade ratios have recently deteriorated slightly, in particular in Latin America, for emerging markets as a whole they remain well below US and European ratios.³ Moreover, in terms of volume, upgrades over the first three quarters of 2006 by far outweigh downgrades, which, largely owing to the negative US performance, is not the case for developed countries. Furthermore, sovereign bonds of emerging markets improved their credit quality overall, reporting eight upgrades and only two downgrades in the third quarter of 2006. Four of those upgrades took place in the Asia/Pacific region. The two downgrades, one in the Eastern Europe, Middle East and Africa region, were by far outweighed by upgrades in volume terms.

Figure 18. Emerging market bonds spreads



Note: Daily data until 6 October 2006. JP Morgan EMBI Global blended spreads over US benchmark bond yields. EMBI Global covers US dollar denominated Brady Bonds, Eurobonds, Traded Bonds and local market debt instruments issued by sovereign and quasi-sovereign entities.

Note also that, according to information from JP Morgan, the strong drop from 10 to 13 June 2005 in the Latin American and, consequently, in the emerging markets total index is due to an intra-month rebalancing triggered by the Argentina debt exchange. As a result of the rebalancing, Argentina defaulted debt (with spreads of 5000 b.p. and above) was partially replaced with performing debt with much lower spreads.

Source: Thomson Financial Datastream, OECD.

Positive fundamentals are also behind international investors' increasing interest in holding emerging market securities denominated in the issuer's own currency. Implicit in such developments are expectations of sustained economic and financial stability in emerging markets, outweighing risk considerations, and changing long-held views about structural weaknesses inherent in developing markets. So far, new market advances, improved financing terms and improved market access for emerging markets have contributed to a "virtuous circle"⁴ which should further boost economic progress.

Looking at the various regions, in Latin America the Brazilian Bovespa index has generally outperformed the overall Latin American equity index over the past few months. With a strong current account position Brazil has been able to accumulate reserves and has been moving towards an

... and economic and financial stability has increased investors confidence...

... in Latin America,...

investment-grade rating. But growth has remained below its large emerging market peers. Given such developments, along with the still relatively high interest rates, some international investors have shifted their investments from equity toward fixed-income. Should growth resume at a higher pace and interest rates come down as widely expected, such a trend could be reversed.

*...and in Asia,
despite the recent
difficulties,...*

Investors have also stayed confident with respect to investments in Asia, despite the difficulties the region has been facing recently. In Indonesia, a country still under the spell of the bird flu and having been hit by a tsunami in July, the government announced early in October that it will repay early its remaining obligations to the International Monetary Fund. This positive record has been backed by the country's strong economic recovery and its healthy balance of payments position. In Thailand the government had been overthrown by a military coup in September. While the baht slightly weakened on the event and stock markets and banks closed on the day of the coup, no longer-lasting negative effects became evident on the markets. The Philippines, where an ambitious plan to boost economic growth had been announced, successfully placed about USD 750 million in sovereign bonds at the end of July, despite the country's high level of debt.

*... and in China,
where reforms
continued,...*

In China, the renminbi has appreciated substantially, continuing a rise which had already started in May. Important reforms are being undertaken to open up the Chinese economy and its financial markets, and these developments may have a bearing on exchange rate dynamics.⁵

*... as well as in the
MENA region,
which offers
profitable
investment
opportunities
despite remaining
security risks.*

Following a decline in line with other EMBI spreads, the Middle East index spread increased substantially in the second quarter of this year, driven by investors' fears over the continuing political instability in the region, in particular the on-going civil conflict in Iraq and the recent war in Lebanon. However, the Arabian markets share price index which had started to decline from speculatively high levels already in November last year, turned towards a recovery in July and its volatility has decreased, owing to a positive economic outlook for the Middle East and North Africa (MENA) region

more generally. The strong economic performance is underpinned not only by high oil prices but also economic reforms. Liberalising investment regimes and modernising financial markets has been high on the agenda of many governments of MENA countries. The fact that privatisations, especially in the Gulf countries, have usually been significantly oversubscribed indicates that such reforms have been increasing profitable investment opportunities for foreign as well as local investors, thus taking advantage of the region's wealth and local savings.

Notes

1. In the United States, housing items (including energy costs and furnishing) account for about 40 per cent in the consumer price index, with 23 per cent being attributed to imputed rents ("Owners' equivalent rent of primary residence") and only about 6 per cent to actual rents ("rent of primary residence").
2. Standard and Poor's, Global Fixed Income Research, *Global Corporate and Sovereign Rating Actions: Third Quarter 2006*.
3. Based on Standard and Poor's, Global Fixed Income Research, *Global Corporate and Sovereign Rating Actions: Third Quarter 2006*.
4. See also *A Virtuous Circle of Success in Sight*, Commentary by John Lipsky in The Straits Times, Singapore, 18 September 2006.
5. See also the article on financial sector reforms in China in this issue of *Financial Market Trends*.

L'actualité récente des marchés des capitaux

I. Vue d'ensemble

Après quelques mouvements de correction importants fin mai et début juin, les principaux marchés ont renoué avec la croissance et à peu près regagné le terrain cédé à cette occasion, ce qui traduit l'attitude toujours positive des investisseurs. Face au ralentissement de la croissance économique cette attitude repose dans une large mesure sur des paramètres fondamentaux qui sont demeurés solides, comme la bonne santé des bilans des entreprises, la croissance vigoureuse de leurs bénéfices et la faiblesse des taux de défaillance. La baisse des prix des obligations s'est interrompue et les rendements obligataires, quoique instables, sont pour l'essentiel restés hésitants depuis la mi-mai. Les écarts de rémunération des obligations de sociétés, tout en étant restés relativement faibles, se sont un peu creusés ces derniers mois.

Tandis que les banques centrales continuaient de retirer des liquidités du marché, les taux d'intérêt à court terme ont progressé, mais ces augmentations n'ont pas été entièrement répercutées dans le compartiment du long terme. Face à un coup de froid sur le marché du logement, notamment aux États-Unis, et au renchérissement du pétrole, les observateurs ont craint de plus en plus que les risques de détérioration des perspectives économiques ne se matérialisent. Toutefois, la récente baisse des prix de l'or noir est venue un peu apaiser les tensions inflationnistes qui s'étaient accumulées depuis un an. Cette accalmie – ainsi que l'amélioration de la crédibilité des banques centrales

Après un mouvement important de correction en mai et juin, redressement des marchés d'actions et des marchés des obligations de sociétés bénéficiant toujours de l'attitude positive des investisseurs,...

... mais avec la détérioration des perspectives économiques, les courbes de taux se sont aplaties, tandis que les banques centrales continuaient de retirer des liquidités du marché.

dans la lutte contre l'inflation – se reflète également dans un recul des anticipations d'inflation.

*Des rendements
toujours
intéressants pour
les investisseurs
étrangers sur les
marchés émergents.*

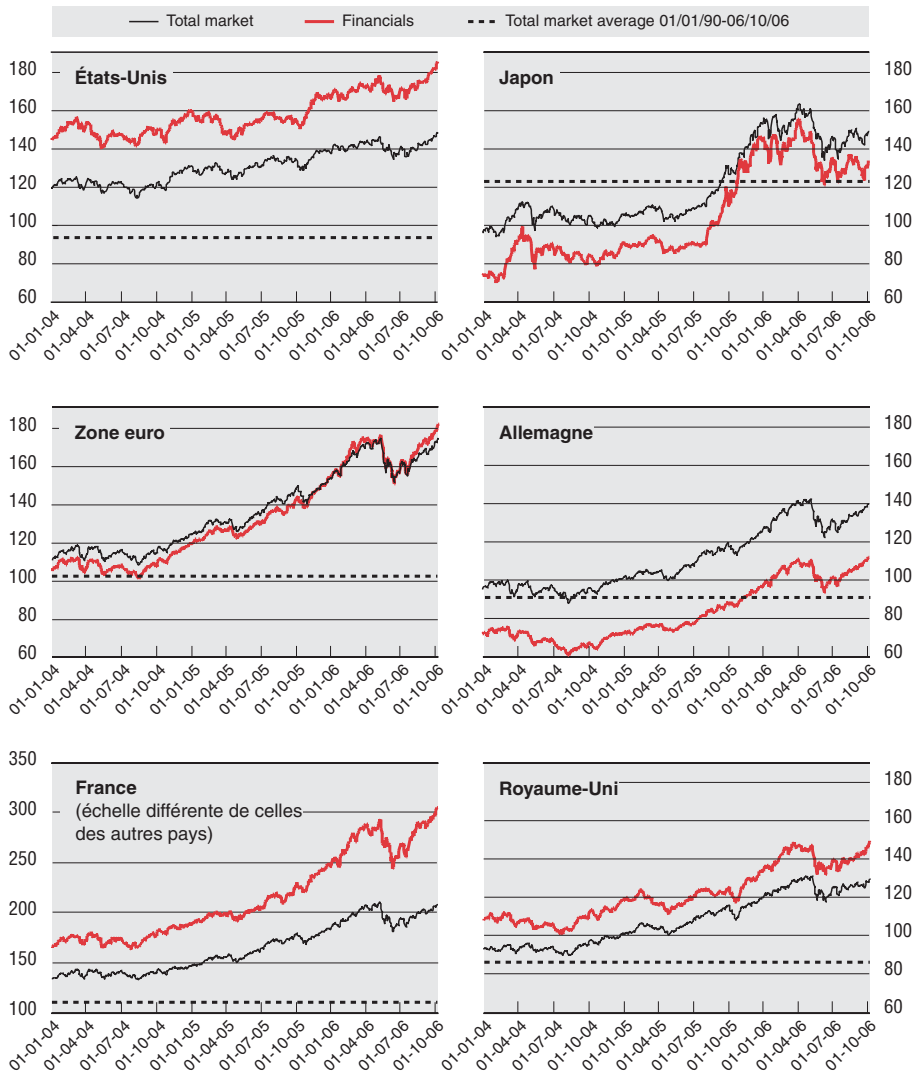
Les marchés émergents, pourtant durement touchés par le retournement du marché en mai-juin, se sont bien rétablis, grâce à des conditions macroéconomiques favorables et des programmes de réforme qui ont permis d'améliorer la solvabilité des marchés émergents – entreprises et emprunteurs souverains confondus – et renforcé l'attrait exercé par leurs émissions sur les investisseurs étrangers.

II. Marchés d'actions

*Le repli
des marchés
d'actions de
mai-juin a effacé
les gains des mois
précédents...*

En mai et début juin, partout dans le monde, les marchés d'actions ont subi des mouvements de correction considérables, au moment où certains risques de surexposition se sont concrétisés, les investisseurs craignant une accélération de l'inflation, une hausse des taux d'intérêt et un enlisement de l'économie (graphique 1). Après avoir atteint des sommets aux alentours du 9 mai, certains grands marchés sont revenus aux niveaux qu'ils avaient enregistrés au dernier trimestre de 2005, ce qui impliquait pour certains d'entre eux des reculs de l'ordre de 20 %. Ces reculs ont été particulièrement sensibles sur des marchés ayant précédemment affiché de fortes hausses, comme au Japon ou dans la zone euro. Le 13 juin, l'indice généraliste japonais est revenu brusquement à son niveau de fin octobre 2005, soit une baisse de plus de 20 % par rapport à son sommet du 9 mai. Pour sa part, l'indice généraliste de la zone euro a reculé de plus de 17 % durant la même période pour s'établir de nouveau à son niveau de janvier 2006. En ce qui concerne l'indice généraliste américain, la perte correspondante a été légèrement inférieure à 9 %, ce qui a néanmoins effacé en quelques jours les gains enregistrés depuis novembre 2005.

Graphique 1. Principaux marchés d'actions
Indices du marché total et des valeurs du secteur financier,
base 100 au 1^{er} janvier 1998 = 100



Note : Indices Datastream. Données quotidiennes jusqu'au 6 octobre 2006.

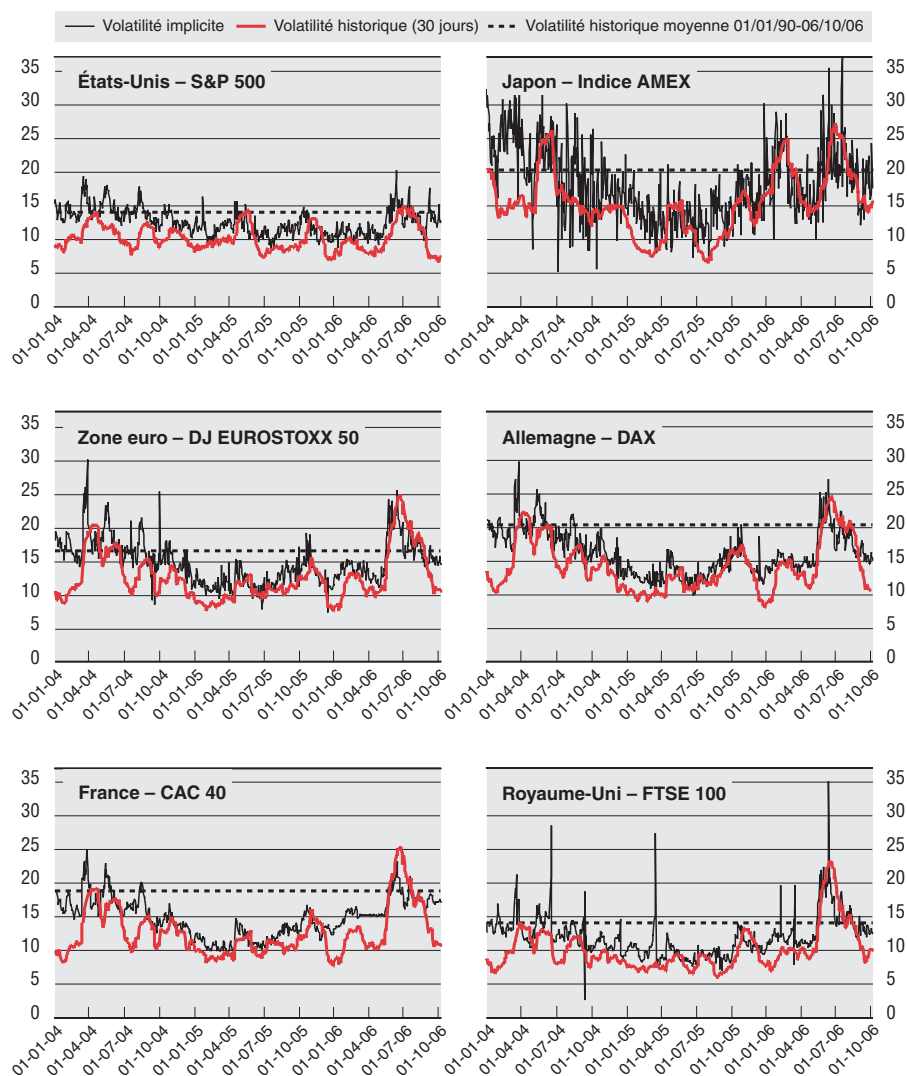
Source : Thomson Financial Datastream.

***... et la volatilité
s'est accrue par
crainte d'un
ralentissement
économique,...***

Au cours de ces ajustements à la baisse, la volatilité des principaux indices s'est sensiblement accrue au point de devenir supérieure aux moyennes de long terme (mesurées depuis le début de 1990) et elle a continué de s'accroître alors même que les marchés commençaient déjà à retrouver de leur vigueur (graphique 2). Les indicateurs de volatilité ne se sont repliés qu'en juillet et août, mais sont restés supérieurs à leur niveau antérieur au mouvement de correction du début mai, ce qui témoigne d'une certaine exacerbation des incertitudes de la part des investisseurs quant à l'orientation future des marchés d'actions. Le fait que la volatilité historique de tous les grands indices, qui est une mesure rétrospective, est restée bien inférieure à la volatilité implicite des marchés d'action, qui est une mesure prospective (fondée sur les contrats d'option), vient corroborer cette observation sur l'incertitude grandissante des investisseurs.

***... mais ces derniers
mois les marchés
ont retrouvé leur
trajectoire
de croissance,...***

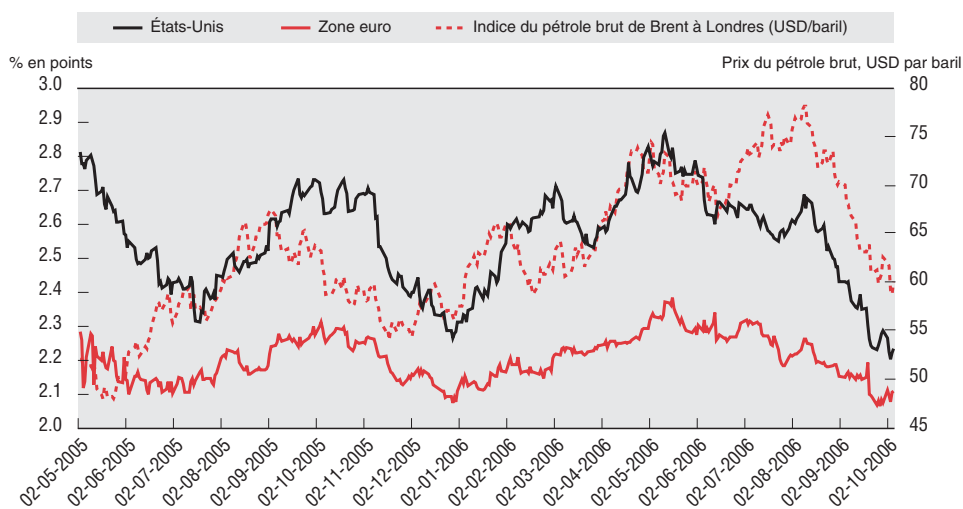
Toutefois, après le mouvement de correction de mai-juin, les marchés ont renoué avec la croissance et nombre de grands indices boursiers ont retrouvé les niveaux qu'ils avaient atteints avant ce repli. Ces évolutions ont été favorisées par des nouvelles positives en matière de bénéfices et les perspectives de croissance favorables pour la zone euro et le Japon, ainsi qu'une baisse des prix du pétrole qui est venue apaiser les tensions inflationnistes. Durant cette phase de reflux des prix du pétrole, les anticipations d'inflation, mesurées par l'écart de rendement entre obligations classiques et obligations indexées, ont diminué (graphique 3), ce qui améliore l'arbitrage entre production et inflation et encourage l'idée que la Fed serait prête à soutenir une économie américaine en cas de ralentissement. En Europe, le récent relèvement du taux directeur de la BCE début octobre a favorisé l'optimisme des investisseurs et porté les cours des actions à un niveau sans précédent depuis cinq ans. Cela étant, même si les marchés de capitaux ont fait fi des récentes augmentations des prix du pétrole début octobre, ces hausses ont montré que le risque de connaître des prix de l'or noir plus élevés et plus instables demeure.

Graphique 2. **Marchés boursiers : volatilités implicites et historiques**

Note : Données quotidiennes jusqu'au 6 octobre 2006. Les volatilités historiques sont des volatilités mensuelles calculées à partir des données quotidiennes. On peut considérer que la volatilité implicite est égale à l'anticipation par le marché du risque (volatilité future) et elle est calculée à partir des prix d'options d'achat à parité (interpolées) à l'aide de la formule de Black-Scholes. La méthode binomiale de Cox-Rubinstein est utilisée pour les options à l'américaine.

Source : Thomson Financial Datastream.

Graphique 3. Anticipations implicites d'inflation et prix du pétrole brut



Note : Données quotidiennes jusqu'au 6 octobre 2006. Les anticipations implicites (« point mort d'inflation ») sont égales aux différences de rendement entre les obligations d'État de référence à 10 ans et les obligations indexées sur l'inflation (indices Merrill Lynch des obligations d'État indexées sur l'inflation).

Source : Thomson Financial Datastream.

**...sans donner
de signes
de surévaluation,
car les paramètres
fondamentaux sont
restés à peu près
inchangés.**

Si l'on examine les coefficients de capitalisation des résultats (CCR) des principaux indices, on ne perçoit guère de signes que les actions sont surévaluées (tableau 1). Les CCR de l'ensemble des indices boursiers généralistes des pays du G-7 et ceux de presque tous les indices sectoriels sont inférieurs à leurs moyennes de long terme (mesurées depuis le début de 1990), malgré la forte progression affichée par certains grands indices. C'est ainsi que la plupart des indices européens ont enregistré une hausse de plus de 10 % depuis le début de l'année. Cela vient corroborer le caractère temporaire du mouvement de correction de mai-juin sur les marchés d'actions et l'attitude positive des investisseurs par la suite, qui a permis de remettre les cours des actions sur les rails de la hausse.

Tableau 1. Évolution des indices boursiers généralistes et sectoriels dans les principales économies

	États-Unis	Japon	Zone euro	Allemagne	France	Italie	Royaume-Uni	Canada
<i>Indices boursiers généralistes</i>								
	WILSHIRE 5000	NIKKEI 225	DJ EURO STOXX	DAX 30	CAC 40	MILAN MIBTEL	FTSE 100	S&P/TSX COMP.
Var. % déc. 05-oct. 06	6.1 %	4.0 %	13.3 %	13.0 %	11.8 %	10.9 %	7.6 %	4.6 %
CCR oct. 06 ^b	17.5	27.2	15.1	14.0	14.1	16.1	13.6	14.6
CCR moy. janv. 90-oct. 06 ^b	21.2	47.6	16.2	16.8	15.2	19.0	17.0	18.9
<i>Télécom, Média, informatique^a</i>								
Var. % déc. 05-oct. 06	5.7 %	0.3 %	1.2 %	-2.5 %	-5.3 %	-7.4 %	3.3 %	16.4 %
CCR oct. 06	24.6	27.7	17.6	19.8	13.7	17.0	14.8	29.3
CCR moy. janv. 90-oct. 06	29.2	60.6	21.7	30.9	19.4	21.1	23.7	28.5
<i>Valeurs financières^a</i>								
Var. % déc. 05-oct. 06	10.1 %	-6.9 %	18.8 %	17.1 %	23.3 %	18.8 %	12.4 %	8.3 %
CCR oct. 06	14.2	23.0	13.7	12.4	12.8	17.9	13.5	14.4
CCR moy. janv. 90-oct. 06	15.3	61.2	15.7	18.8	12.5	20.3	16.5	13.7
<i>Dont : Banques^a</i>								
Var. % déc. 05-oct. 06	9.2 %	-7.5 %	19.9 %	16.8 %	25.9 %	22.2 %	9.6 %	9.7 %
CCR oct. 06	13.8	18.8	14.0	11.0	11.9	17.2	11.9	13.2
CCR moy. janv. 90-oct. 06	14.2	93.8	13.3	13.6	10.8	16.2	14.1	13.1
<i>Sociétés d'assurance^a</i>								
Var. % déc. 05-oct. 06	4.4 %	3.1 %	14.2 %	16.0 %	14.5 %	7.2 %	13.6 %	4.2 %
CCR oct. 06	12.0	34.6	12.3	11.5	11.1	17.1	12.2	14.6
CCR moy. janv. 90-oct. 06	17.4	43.8	20.6	32.7	13.8	29.4	18.8	13.9
<i>Sociétés d'assurance vie^a</i>								
Var. % déc. 05-oct. 06	5.5 %	8.8 %	13.5 %	13.8 %	13.7 %	-3.6 %	12.8 %	3.9 %
CCR oct. 06	14.4		12.1		8.5	19.9	12.0	15.1
CCR moy. janv. 90-oct. 06	14.8		24.9		10.1	37.3	19.3	15.0

Note : Les calculs sont établis à partir de moyennes mensuelles (pour octobre 2006, les données vont jusqu'au 6 octobre seulement). Les bénéfices par action qui représentent le dénominateur des coefficients de capitalisation des résultats (CCR), sont calculés à partir du dernier taux annualisé correspondant au dernier exercice ou à partir d'une agrégation des résultats des périodes intermédiaires. Pour la France, les bénéfices courants par action sont une prévision fournie par des sources locales. Pour le Royaume-Uni, les bénéfices sont calculés à l'aide d'une méthode d'analyse glissante sur 12 mois s'appuyant sur les comptes intermédiaires, définitifs et annuels.

a) Indices Datastream. L'indice des valeurs des assurances couvre les sociétés d'assurance non vie, les courtiers en assurance et les autres sociétés d'assurance, à l'exclusion des sociétés d'assurance vie.

b) D'après les Indices du marché total calculés par Datastream..

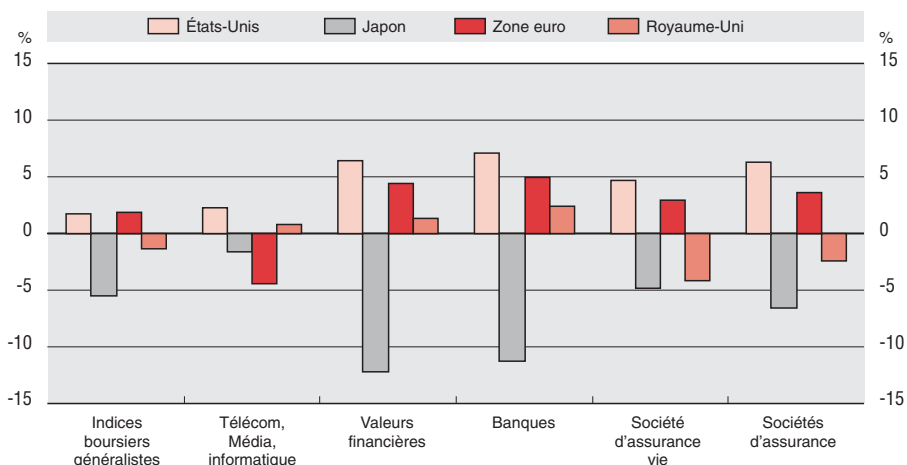
Source : Thomson Financial Datastream.

De bonnes performances des secteurs financiers des pays du G-7, mais un repli des valeurs bancaires au Japon ; ailleurs, les banques risquent de subir les effets de l'aplatissement de la courbe des taux et d'un coup de froid sur le marché du logement.

Les indices des valeurs financières se sont mieux comportés que les indices généralistes dans toutes les économies du G-7 hormis le Japon où les mauvais résultats des banques ont fait baisser l'indice local des valeurs financières. Malgré les performances positives affichées par les sociétés d'assurance depuis le début de l'année, ce secteur a lui aussi enregistré de mauvaises performances ces six derniers mois (graphique 4). Aux prises avec un gonflement de leurs coûts de refinancement et souvent enfermées dans une faible rentabilité à long terme, de nombreuses banques japonaises subissent le coût de l'ajustement au niveau régime monétaire de la Banque du Japon. En revanche, les banques de la zone euro ont figuré parmi les premiers de la classe depuis le début de l'année, avec une progression de près de 20 % de l'indice des valeurs bancaires local (tableau 1). Plus récemment, sur les six derniers mois, l'indice américain des valeurs bancaires a fait mieux que les indices correspondants des pays du G-7 avec une hausse de près de 10 %. Toutefois, l'aplatissement de la courbe des taux et le coup de froid sur le marché du logement risquent d'exercer des pressions supplémentaires sur les banques,

Graphique 4. Performances récentes des indices boursiers sectoriels dans les principales économies

Variations en pourcentage d'avril à octobre 2006



Note : Les calculs reposent sur des moyennes mensuelles. Les indices correspondent à ceux du tableau 1.
Source : Thomson Financial Datastream.

notamment aux États-Unis où elles ont pris plus de risques *vis-à-vis* du secteur des ménages en multipliant les émissions d'instruments hypothécaires non traditionnels et en accordant des prêts à des emprunteurs de qualité inférieure.

Le secteur américain de l'assurance, qui avait souffert de la saison des ouragans l'an dernier (et plus particulièrement de la catastrophe de la Nouvelle-Orléans), semble avoir bien traversé la saison des intempéries de cette année, qui a cependant été plus clément. Les entreprises du secteur ont amélioré leurs bilans en relevant leurs tarifs d'assurance en fonction des dommages considérables subis précédemment et aussi parce qu'on construit de plus en plus de maisons le long des zones dangereuses du littoral qui donnent lieu des primes d'assurance plus chères.

La ruée sur les fonds d'arbitrage qui avait été particulièrement forte l'an dernier s'est ralentie. Cela étant, ces fonds restent des placements intéressants. Ils ont résisté à la tempête boursière de mai-juin en mettant à profit l'accentuation de la volatilité et ils ont ainsi pu afficher de meilleures performances que d'autres formules de placement durant cette période (graphique 5). En outre, les observateurs estiment qu'il n'y a pas eu de signe d'embouteillage des transactions durant cette phase de repli et n'ont pas eu à redouter que les fonds d'arbitrage se trouvent contraints de vendre en pleine phase de baisse au cas où les appels de marge les obligeraient à trouver des nantissements pour leurs investissements à risque. Les performances des fonds d'arbitrage ont été moins bien orientées ces derniers temps et leur corrélation avec les indices boursiers a diminué avec l'apaisement de la volatilité des marchés d'actions.

III. Marchés obligataires et taux d'intérêt

L'évolution des marchés obligataires a été dictée par des incertitudes quant aux perspectives économiques et des attentes *vis-à-vis* de la réaction des banques centrales aux tensions inflationnistes. Apparue au début de l'année, la tendance à la hausse des rendements des principales obligations de référence a subi un coup d'arrêt au moment du mouvement de correction des marchés d'actions en mai et

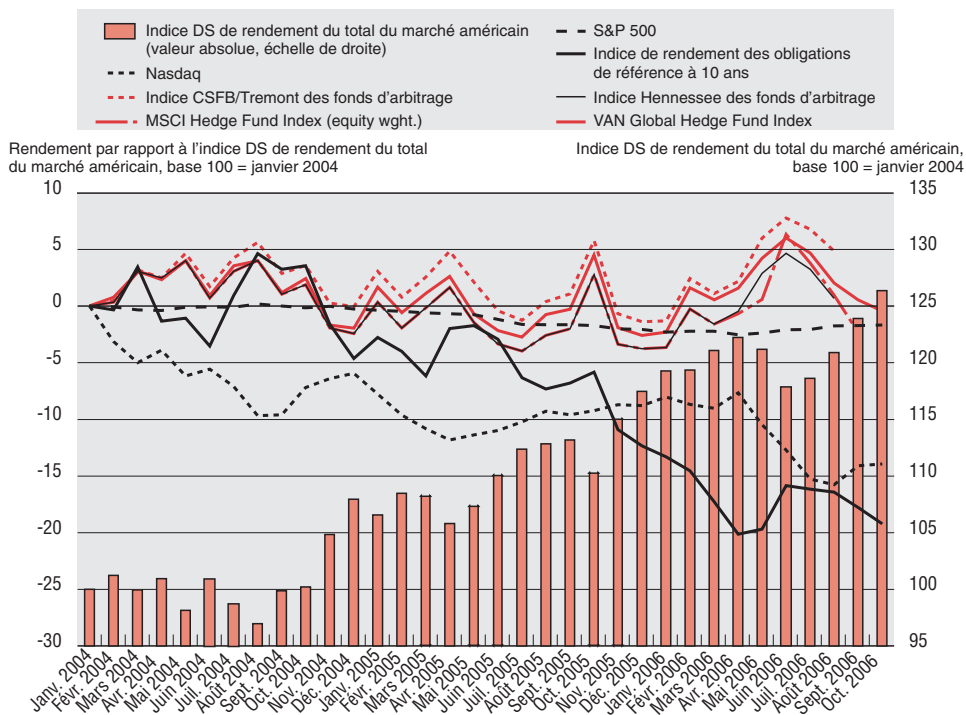
Après une année 2005 difficile, nette amélioration pour le secteur américain des assurances.

Bonnes performances des fonds d'arbitrage durant le repli des marchés d'actions.

Des marchés obligataires désorientés par les incertitudes entourant les perspectives économiques,...

Graphique 5. Performances relatives des valeurs mobilières américaines et des fonds d'arbitrage

Rendements relatifs par rapport au total du marché généraliste.
(Indice DS du total du marché, base 100 = janvier 2004)

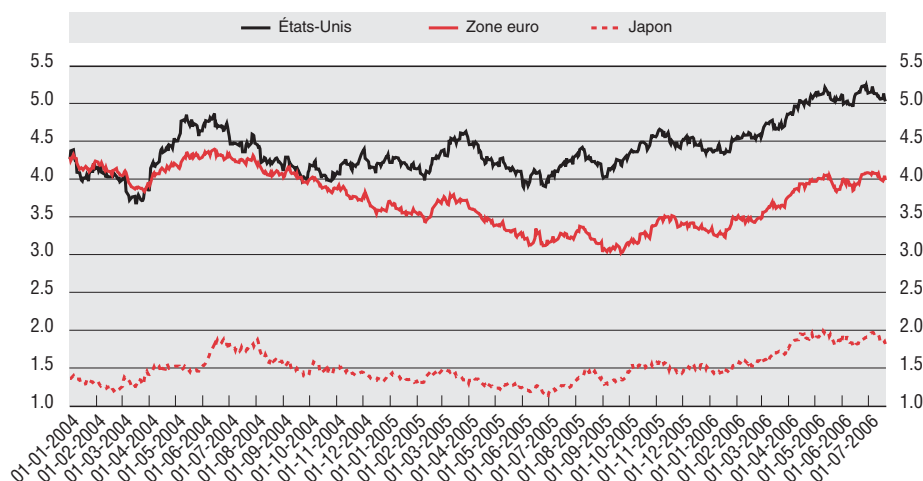


Note : Pour octobre 2006, les données reposent sur des moyennes jusqu'au 6 octobre.

Source : Thomson Financial Datastream.

début juin (graphique 6). Les investisseurs se tournant vers les marchés des valeurs à revenu fixe pour y trouver des actifs plus sûrs, leur désengagement massif vis-à-vis des marchés d'actions a entraîné une ascension du prix des obligations. En un mois, de la mi-mai à la mi-juin, les rendements des principales obligations de référence ont ainsi cédé une vingtaine de points de base. Or, le redressement des rendements qui s'est ensuivi durant la deuxième quinzaine de juin n'a pas été soutenu. Dans l'ensemble, la volatilité des marchés obligataires est restée faible. La volatilité des rendements des obligations de référence diminuait légèrement aux États-Unis et dans la zone euro, alors qu'elle a augmenté au Japon.

Graphique 6. Rendements des obligations d'État à 10 ans



Note : Données quotidiennes jusqu'au 6 octobre 2006.

Source : Thomson Financial Datastream.

Une bonne part des incertitudes entourant les perspectives de croissance et d'inflation pour les échéances longues de la courbe des taux a été influencée par les craintes quant à l'impact d'un coup de froid sur le marché américain du logement dont on pensait qu'il allait peser négativement sur les dépenses des consommateurs et sur les perspectives de croissance économique aux États-Unis. Parallèlement, les tensions inflationnistes se sont accumulées à partir du moment où les précédentes hausses des prix du pétrole se sont répercutées sur l'inflation sous-jacente. De plus, certains ont affirmé qu'une relation inverse entre les prix du logement et les loyers pouvait exercer des tensions à la hausse de l'IPC, par l'intermédiaire des coûts de location si les prix des logements baissent ou augmentent plus lentement¹. Toutefois, les éléments empiriques dont on dispose sur l'existence d'un tel effet ne sont pas concluants. Il semble plutôt qu'il y ait parfois un effet positif différé des prix du logement sur l'IPC, ce qui implique qu'un ralentissement du marché du logement exercerait des effets modérateurs sur la hausse des prix à la consommation et, ce faisant, sur les taux d'intérêt à long terme.

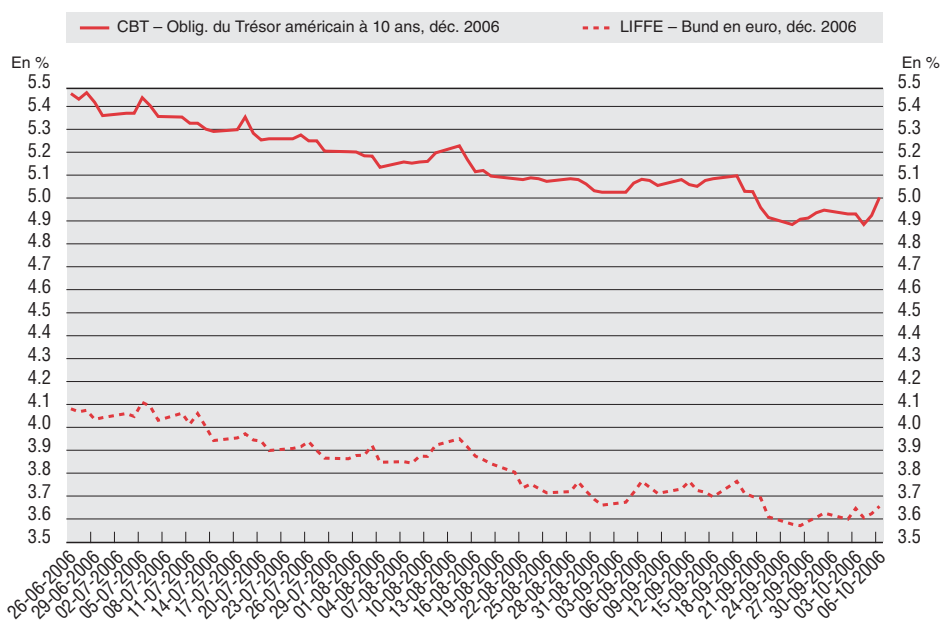
... entre impact d'un coup de froid sur le marché du logement, effet du renchérissement du pétrole...

**... et repli
des anticipations
sur les taux longs,...**

Pour les États-Unis comme pour la zone euro, l'optimisme régnant sur le marché obligataire a modéré ces derniers mois les anticipations relatives aux rendements obligataires à long terme (graphique 7). Les contrats à terme, échéance décembre, sur les obligations du Trésor des États-Unis à 10 ans se sont inscrits en repli de 50 points de base ces quatre derniers mois et on a pu observer un recul du même ordre pour les contrats à terme sur Bund en euro. Tout en étant conforme aux révisions en baisse des prévisions de croissance et au repli des anticipations d'inflation dû au reflux des prix du pétrole, ce phénomène reflète sans doute aussi la crédibilité acquise par les banques centrales dans la lutte contre l'inflation.

**Graphique 7. Évolution des anticipations de taux d'intérêt
sur les principaux marchés**

Contrats sur taux longs, Contrats à échéance décembre 2006



Note : Données au 6 octobre 2006.

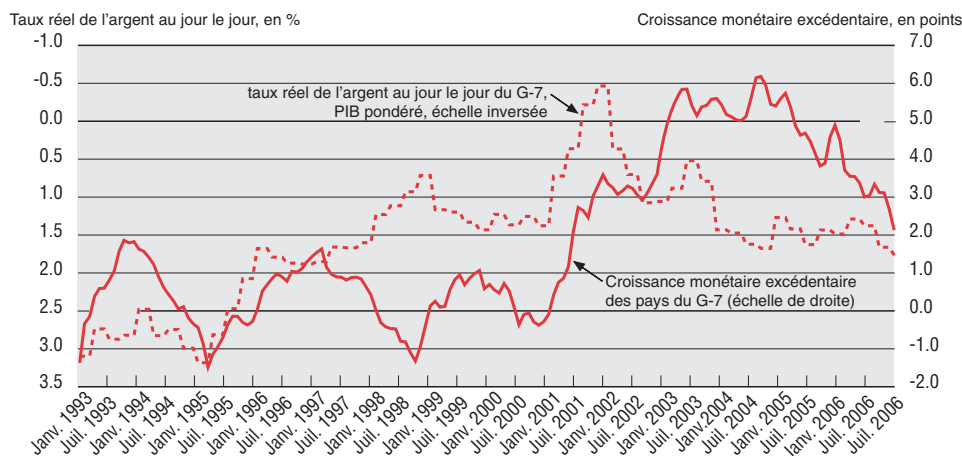
Sources : Thomson Financial Datastream, OCDE.

De fait, les banques centrales continuant partout à retirer des liquidités (graphique 8), les courbes des taux se sont aplaties et se sont même inversées aux États-Unis et au Royaume-Uni (graphique 9). Alors que la Fed, après le dernier relèvement d'un quart de point des taux fin juin qui a porté l'objectif du taux des fonds fédéraux à 5.25 %, avait semblé vouloir observer une pause dans son mouvement de resserrement, la BCE, après avoir remonté le taux de ses prises en pension (le « repo ») à 3.25 % début octobre, a

... tandis que les banques centrales continuent de retirer des liquidités du marché.

Graphique 8. Indicateurs de l'évolution de la liquidité mondiale

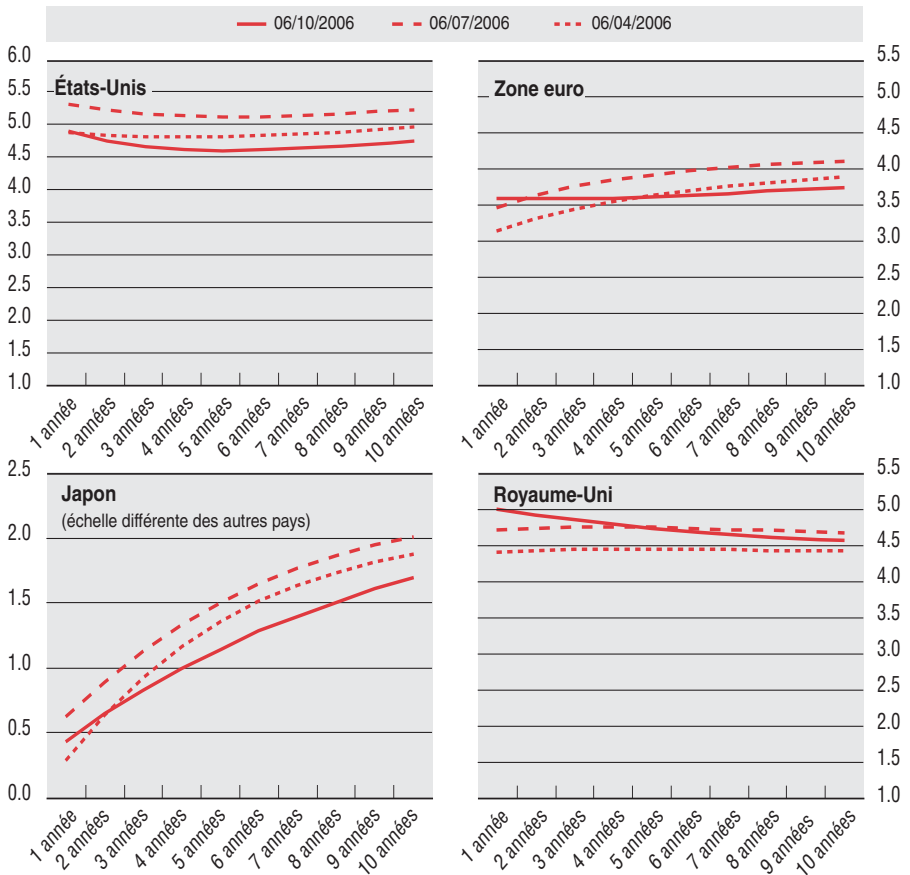
Taux réel de l'argent au jour le jour du G-7, PIB pondéré, échelle inversée, et croissance monétaire effective diminuée de la croissance réelle du PIB potentiel, en points



Note : L'indicateur de la liquidité mondiale fondé sur l'évolution des taux d'intérêt réel est inspiré de Borio et White (2004) « Whither monetary and financial stability ? The implications of evolving policy regimes », *BIS Working Paper* n°147. L'indicateur présente une moyenne pondérée des taux de l'argent au jour le jour des pays du G-7 ; pour la France et l'Allemagne, l'EONIA est utilisé à partir de 1999. Les pondérations reposent sur le PIB en dollar et les taux réels sont calculés en déduisant les moyennes mensuelles sur trois mois des variations de l'IPC en glissement annuel des taux réels au jour le jour, en prenant en compte les projections sur les variations de l'IPC lorsque l'on ne disposait pas des toutes dernières statistiques. L'autre indicateur s'attache à la croissance monétaire excédentaire du G-7 (également en moyenne pondérée du PIB). La croissance monétaire nominale effective est la croissance trimestrielle en glissement annuel des agrégats monétaires larges ; la croissance réelle du PIB potentiel est corrigée de la croissance tendancielle de la vitesse de circulation ; en d'autres termes, c'est un indicateur de croissance monétaire résiduel calculé à partir de l'équation quantitative de la monnaie en prenant pour hypothèse une inflation nulle. La croissance tendancielle de la vitesse de circulation repose sur la croissance moyenne de la vitesse de circulation sur la période 1980-2002 dans les différentes économies, hormis pour la zone euro, où elle repose sur la valeur médiane de la fourchette de croissance de la vitesse de circulation correspondant à l'hypothèse de la Banque centrale européenne pour le calcul de la valeur quantitative de référence de la croissance monétaire (0.75).

Source : Thomson Financial Datastream ; OCDE, *Principaux indicateurs économiques* et Base de données des *Perspectives économiques* ; Banque centrale européenne.

Graphique 9. Courbe des taux

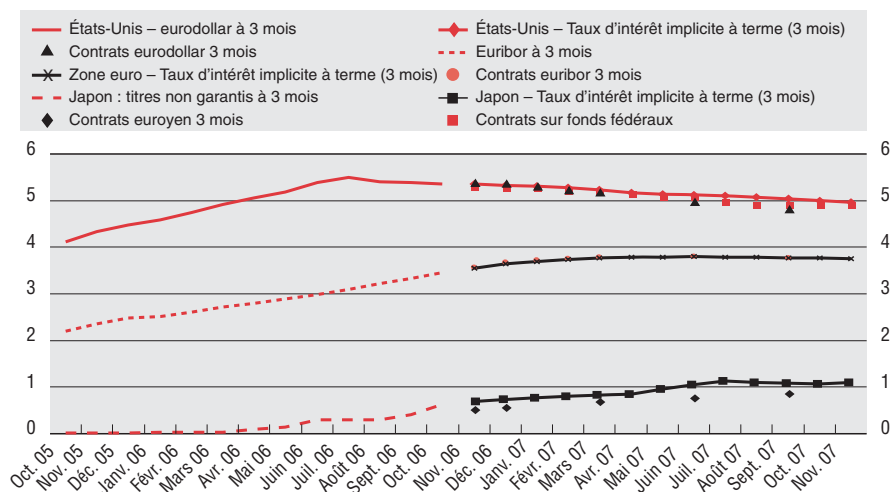


Note : Moyennes mensuelles de données quotidiennes..
Source : Thomson Financial Datastream.

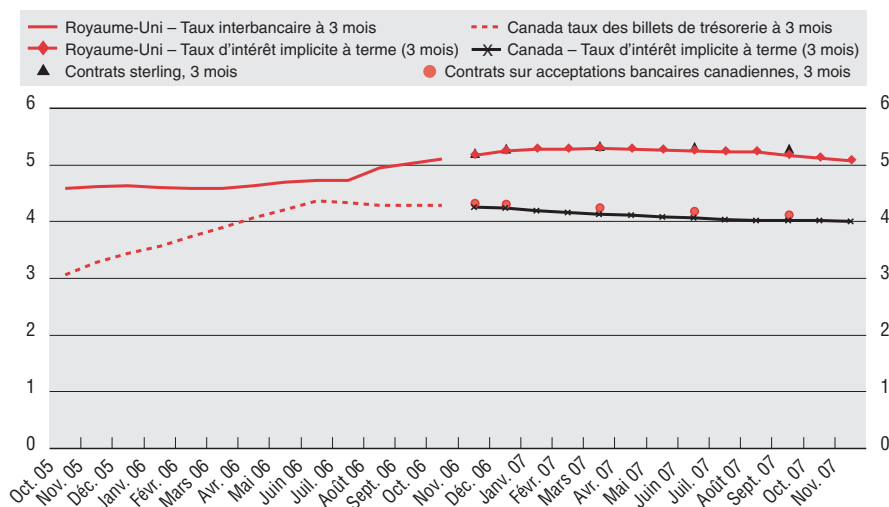
encouragé les rumeurs d'un nouveau relèvement en décembre. Les anticipations relatives aux taux courts aux États-Unis, telles qu'elles ressortent des taux à terme et des contrats à terme, plaident pour un certain assouplissement de la politique monétaire de la Fed l'an prochain (graphique 10). D'après des indicateurs de ce type, les investisseurs attendent de nouvelles mesures de resserrement de la part de la BCE d'ici la fin de l'année. Pour l'an prochain, on table sur une stabilité des taux courts pour la zone euro. Au Japon, où la Banque du Japon a mis un terme à sa politique

Graphique 10. Taux implicites à court terme dans les contrats à terme de gré à gré et standardisés

a) États-Unis, zone euro et Japon



b) Royaume-Uni et Canada



Note : Données au 6 octobre 2006. Taux effectifs : États-Unis : taux médian de l'eurodollar à 3 mois ; zone euro : Euribor à 3 mois ; Japon : taux médian des emprunts non garantis à 3 mois ; moyennes mensuelles ; Royaume-Uni : taux interbancaire offert à 3 mois ; Canada : taux médian à 3 mois des billets de trésorerie, moyennes mensuelles. Les taux implicites à terme sont calculés à partir des courbes de rendement des obligations sans coupon. Contrats à terme sur eurodollar : contrat sur eurodollar à 3 mois (CME) ; contrats à terme sur Euribor (LIFFE) ; Royaume-Uni : contrats à terme sur sterling à 3 mois (LIFFE) ; Canada : contrats à terme sur acceptation bancaire à 90 jours (ME).

Source : Thomson Financial Datastream, OCDE.

d'assouplissement monétaire en mai, les anticipations relatives aux taux d'intérêt sont plus volatiles. Après avoir été orientées à la hausse, les anticipations relatives aux futures augmentations des taux courts se sont inscrites en recul sensible ces derniers mois. Au Royaume-Uni, où la Banque d'Angleterre a porté son taux directeur à 4.75 % début août, on ne s'attend guère à de nouveaux relèvements des taux. Comme dans le cas des États-Unis, les anticipations concernant les taux courts au Canada sont orientées à la baisse pour l'année prochaine, ce qui signifie que les mesures de resserrement devraient prendre fin dans quelques temps après que la Banque du Canada a fixé le taux cible du financement à un jour à 4.25 % fin mai.

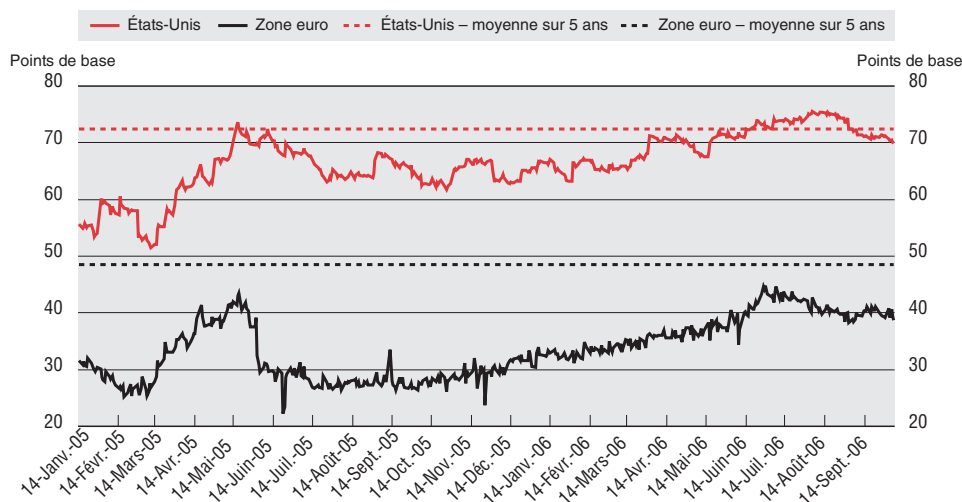
***Attitude positive
des investisseurs
sur les marchés
du crédit,....***

Malgré des perspectives plus ternes concernant la croissance et le resserrement monétaire, les marchés du crédit semblent avoir continué de refléter l'attitude positive des investisseurs. Au lendemain de la vague de vente sur les marchés d'actions durant la deuxième quinzaine de mai et début juin, les écarts de rémunération des obligations de sociétés se sont un peu creusés aux États-Unis comme dans la zone euro. Toutefois, les écarts de rémunération des titres de la catégorie investissement par rapport aux emprunts de référence oscillent encore autour de leurs moyennes sur 5 ans aux États-Unis et ils sont demeurés inférieurs à ces moyennes dans la zone euro (graphique 11). Pour leur part, les écarts de rémunération des obligations à haut rendement sont inférieurs à leur moyenne sur cinq ans des deux côtés de l'Atlantique et ces écarts se sont un peu resserrés ces derniers temps pour la catégorie investissement comme pour les titres à haut rendement (graphique 12).

***... mais un
creusement
des écarts
de rémunération,
certes encore
faibles, qui
témoigne
d'une plus grande
aversion
aux risques.***

Une partie du resserrement des écarts de rémunération s'explique sans doute par la diminution de l'offre après la phase précédente durant laquelle les émetteurs ont essayé de profiter de la faiblesse des taux en accroissant leurs émissions. Mais comme sur les marchés d'actions, les investisseurs ont tenu compte de paramètres fondamentaux positifs et ne pensaient apparemment pas que le cycle du crédit allait parvenir à un point de retournement. Les taux de défaillance des emprunteurs ont diminué à l'échelle mondiale (graphique 13), et les ratios de révision en baisse

Graphique 11. Écarts de rémunération des obligations de sociétés de la catégorie investissement



Note : Données quotidiennes jusqu'au 6 octobre 2006. Rendements agrégés des obligations de sociétés de 5 à 7 ans, notées AA moins rendement des obligations d'État de référence de 5 à 7 ans indices (Merrill Lynch) pour les États-Unis et écart de rendement des titres d'emprunt de la catégorie investissement par rapport aux obligations d'État d'après l'indice JP Morgan Maggie, tous secteurs, toutes échéances (5-6 ans en moyenne), pour la zone euro.

Source : Thomson Financial Datastream.

des notations ont été faibles. Pour la suite cependant, on prévoit une légère augmentation des taux de défaillance dans un avenir proche et les ratios de révision en baisse ont déjà augmenté ces deux derniers trimestres aux États-Unis ainsi qu'en Europe². Devant l'augmentation du nombre d'entreprises placées sur la liste de surveillance des agences de notation par rapport à 2005, bien des observateurs s'attendent à une nouvelle détérioration de la qualité des signatures des entreprises aux États-Unis et dans la zone euro. Aux États-Unis, les risques sont liés au ralentissement de la croissance économique, alors qu'en Europe, la vague montante des fusions-acquisitions risque de mettre à rude épreuve des capacités de certains emprunteurs.

Graphique 12. Écarts de rémunération des obligations à haut rendement

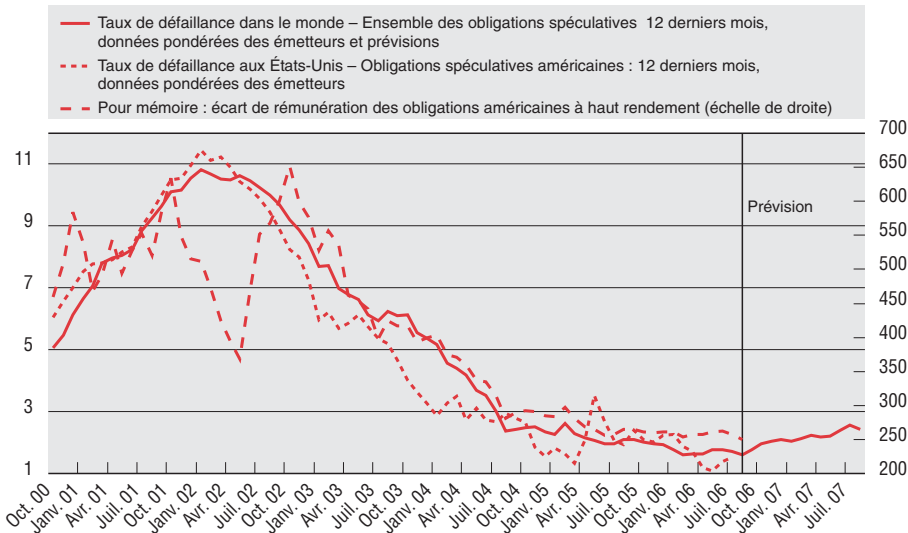


Note : Données quotidiennes jusqu'au 6 octobre 2006. Rendements agrégés des obligations de sociétés à haut rendement diminué des rendements agrégés des obligations notées BAA (indices Lehman) pour les États-Unis ; écart de rendement des titres d'emprunt à haut rendement par rapport aux obligations d'État d'après l'indice JP Morgan Maggie, tous secteurs, toutes échéances, pour la zone euro.

Source : Thomson Financial Datastream.

Graphique 13. Perspectives de défaillance de sociétés dans le monde

Taux de défaillance des emprunteurs de la catégorie spéculative dans le monde, Moody's Investors Service



Source : Moody's Investors Service, Thomson Financial Datastream.

IV. Marchés des changes

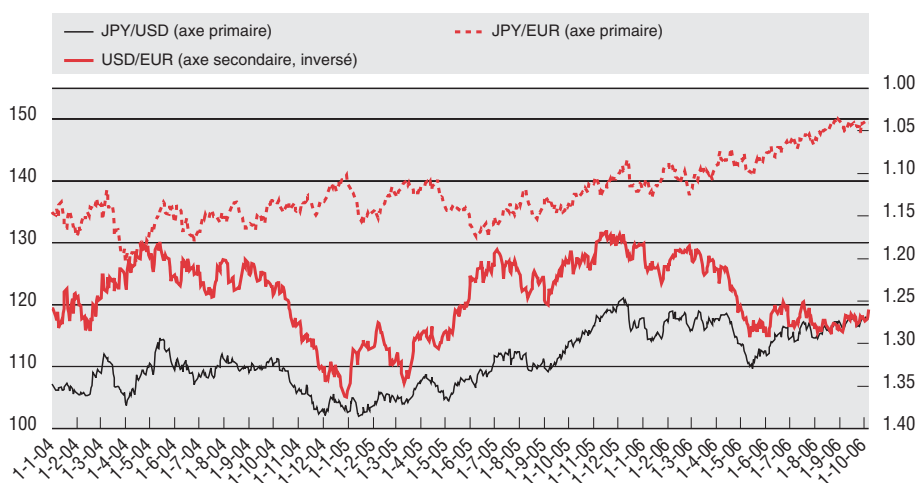
L'évolution des anticipations en matière de croissance et de taux d'intérêt aura aussi été déterminante pour les principaux marchés des changes au cours des derniers mois. Alors que les ajustements à l'ampleur prise par le déficit américain des paiements courants avaient exercé des pressions structurelles sur le dollar des États-Unis et l'avaient placé sur une trajectoire de baisse par rapport à l'euro et au yen, le retournement des marchés d'actions de mai-juin a marqué la fin de cette tendance (graphique 14). Depuis la mi-mai environ, le dollar a commencé à fluctuer plus fortement vis-à-vis de l'euro et du yen avant de se stabiliser récemment dans une fourchette de variation plus étroite.

*Interruption
du recul du dollar
américain en mai,...*

À la mi-mai, lorsque les ventes massives sur les marchés mondiaux d'actions ont partout provoqué de fortes chutes des cours des actions, le dollar a été porté par le retour des investisseurs vers la grande monnaie de réserve mondiale. Pour certains observateurs, le fait que, durant cette période, le dollar a aussi progressé fortement par rapport à un certain nombre de monnaies à rendement élevé, comme le

*... grâce au retour
des investisseurs.*

Graphique 14. Principaux cours de change



Note : Données quotidiennes jusqu'au 6 octobre 2006.

Source : Thomson Financial Datastream.

dollar de Nouvelle-Zélande ou le rand d'Afrique du Sud après que ces deux pays ont fait état d'un creusement marqué de leurs déficits des paiements courants, indique que le billet vert a aussi bénéficié du dénouement d'opérations spéculatives sur écarts de rémunération souvent montées par des fonds d'arbitrages établis aux États-Unis. Après ce coup de fouet donné au dollar, les perspectives positives pour la zone euro et les anticipations de relèvement des taux d'intérêt européens sont venu renforcer davantage la monnaie européenne. Cela étant, les initiatives de relèvement des taux directeurs de la BCE semblent plutôt avoir déçu les espoirs de certains qui attendaient des relèvements plus substantiels et des perspectives de croissance plus positives, ce qui a retiré une partie du soutien dont bénéficiait l'euro.

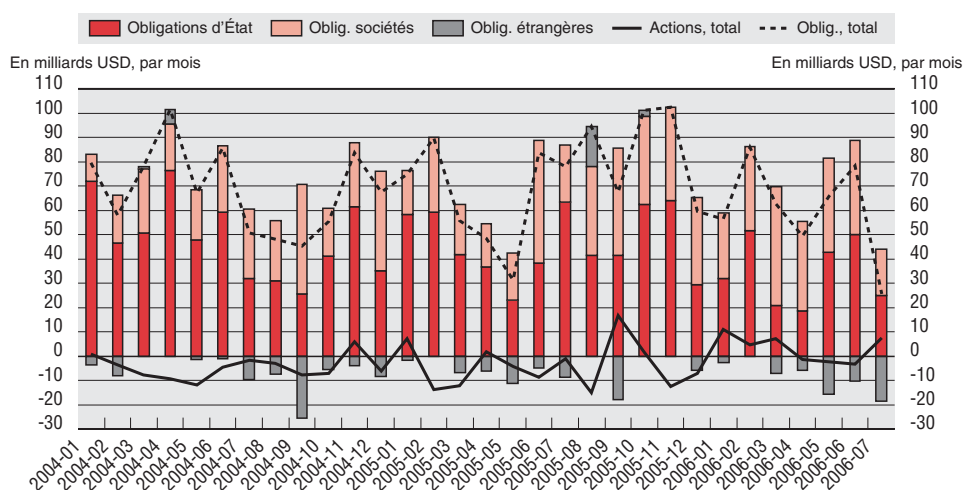
*Un recul du yen
contre euro
peu apprécié
des responsables
européens
et japonais.*

Au Japon, où l'économie ne se remet que lentement de la déflation et où les perspectives de croissance ont récemment été révisées en baisse, le yen a continué de céder du terrain vis-à-vis de l'euro. Même si l'appréciation de la monnaie américaine contre yen a été moins marquée que son redressement vis-à-vis du dollar, les responsables européens et japonais ont récemment indiqué, en marge d'une réunion du G-7 à la mi-septembre, qu'ils préféreraient un yen plus fort par rapport à l'euro ce qui aiderait l'Europe à conquérir quelques parts de marché au Japon. Jusqu'ici cependant, cette « intervention verbale » ne s'est pas traduite par des initiatives concrètes. Mais comme l'ont noté certains observateurs, un tel désaccord exprimé officiellement avec l'évolution effective des cours de change peut accroître les risques de négociation, encourageant ainsi ceux qui spéculent à la vente du yen d'envisager des retournements soudains de leurs positions et de décourager les opérations spéculatives sur écarts de rémunération qui passent pour avoir contribué pour une part importante à la faiblesse récente de la monnaie japonaise.

Jusqu'ici, les éventuels ajustements des cours de change aux déséquilibres mondiaux se sont faits en douceur et, malgré un récent recul en juin, les entrées de capitaux aux États-Unis ont apporté un large soutien au dollar face au gonflement du déficit américain des paiements courants (graphique 15). Avec un total de plus de 855 milliards USD sur 12 mois jusqu'en juillet, les principaux investissements étrangers se sont portés sur les obligations de l'État fédéral américain. Les entrées nettes d'investissement en actions ont progressé en juillet, ce qui a un peu compensé les sorties du marché obligataire.

**Large soutien
des entrées de
capitaux aux
États-Unis face
au déficit
des paiements
courants,...**

Graphique 15. Placements de portefeuille nets de l'étranger aux États-Unis, par catégorie
En milliards USD



Note : Les placements de portefeuille nets sont les achats nets d'actifs par des investisseurs étrangers auprès de résidents des États-Unis (achats bruts – ventes brutes). Les obligations comprennent des obligations américaines et étrangères ; les obligations d'État et de sociétés présentées ici sont uniquement américaines ; les actions comprennent des actions américaines et étrangères.

Source : Trésor des États-Unis, Treasury International Capital (TIC) Reporting System.

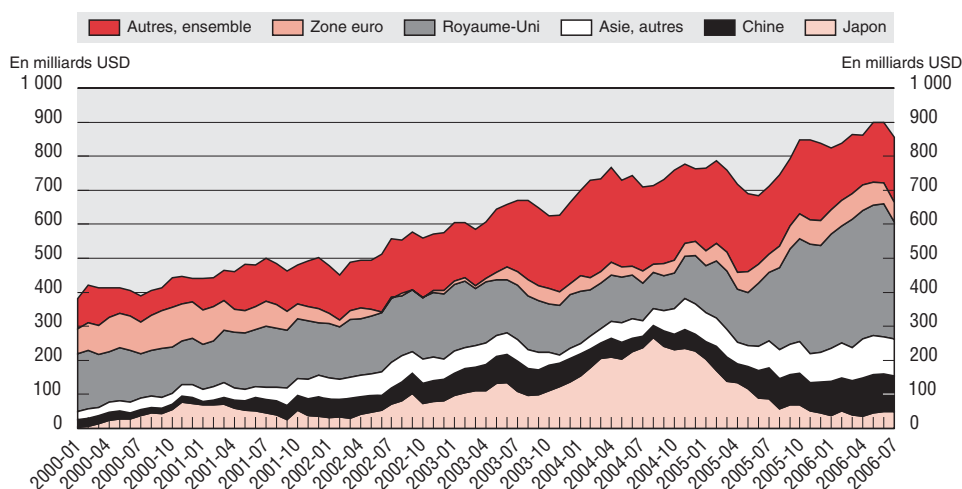
Même si le Japon, avec une part de 30 %, reste le principal détenteur de titres du Trésor des États-Unis à l'étranger, d'autres pays de la région asiatique ont gagné en importance à cet égard. Plus précisément, les entrées d'investissement en provenance de Chine, qui détient actuellement quelque 15 % des titres du Trésor américain à l'étranger, ont sensiblement augmenté ces dernières années, au point de

**... avec une
progression
des entrées
en provenance
de Chine.**

dépasser les entrées nettes en provenance du Japon (graphique 16). Les principales entrées nettes restent attribuées au Royaume-Uni, même si, compte tenu du rôle de centre financier de Londres, l'origine de ces fonds est moins claire. En effet, certains éléments indiquent que ces fonds recouvrent aussi des investissements substantiels des exportateurs de pétrole qui investissent leurs excédents aux États-Unis et sous forme d'autres actifs à l'étranger.

Graphique 16. **Placements de portefeuille nets de l'étranger aux États-Unis, par région**

Montants des 12 derniers mois, en milliards USD



Note : Les placements de portefeuille nets sont les achats nets d'actifs par des investisseurs étrangers auprès de résidents des États-Unis (achats bruts – ventes brutes).

Source : Trésor des États-Unis, Treasury International Capital (TIC) Reporting System.

V. Marchés émergents

Des marchés émergents durement touchés par les ventes massives observées partout dans le monde en mai-juin,...

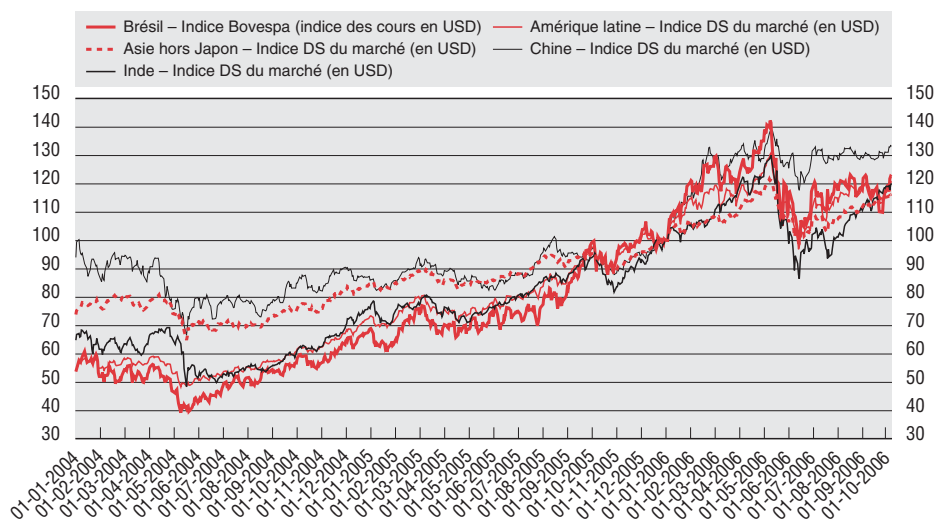
Les marchés émergents ont été durement touchés par le retournement des marchés d'actions de mai et juin. Après avoir enregistré des entrées records d'investissement l'an dernier, ces turbulences boursières ont déclenché les plus fortes sorties hebdomadaires de fonds que ces marchés aient connues en deux ans. Le dénouement de transactions par des investisseurs sur fonds empruntés a déclenché une chute des principaux marchés boursiers émergents (graphique 17) et a par moment porté les écarts de rému-

nération des marchés émergents à des sommets (graphique 18). Parmi les indices boursiers régionaux présentés dans le graphique 17, c'est l'indice latino-américain qui a été le plus mis à mal, reculant de plus de 35 % entre son pic du 10 mai et son nouveau creux du 13 juin. Au niveau national, le marché boursier indien qui, il n'y a guère, profitait d'investissements étrangers considérables, a même été plus durement touchés, cédant près de 48 % durant la même période par rapport à son pic du 10 mai. Pour sa part, l'indice global des marchés asiatiques (hors Japon) a baissé de quelque 23 % du 8 mai au 13 juin.

Même si ces marchés n'ont pas renoué avec leurs sommets du début mai, ils se sont sensiblement redressés depuis lors. Certes, tous les investisseurs ne sont pas revenus après leur désengagement massif, mais les paramètres fondamentaux toujours positifs de ces marchés ont jusqu'ici soutenus marchés. Les ratios des révisions en baisse de la notation des entreprises se sont légèrement détériorés récemment,

... mais qui se sont redressés depuis, grâce à leurs paramètres fondamentaux restés solides...

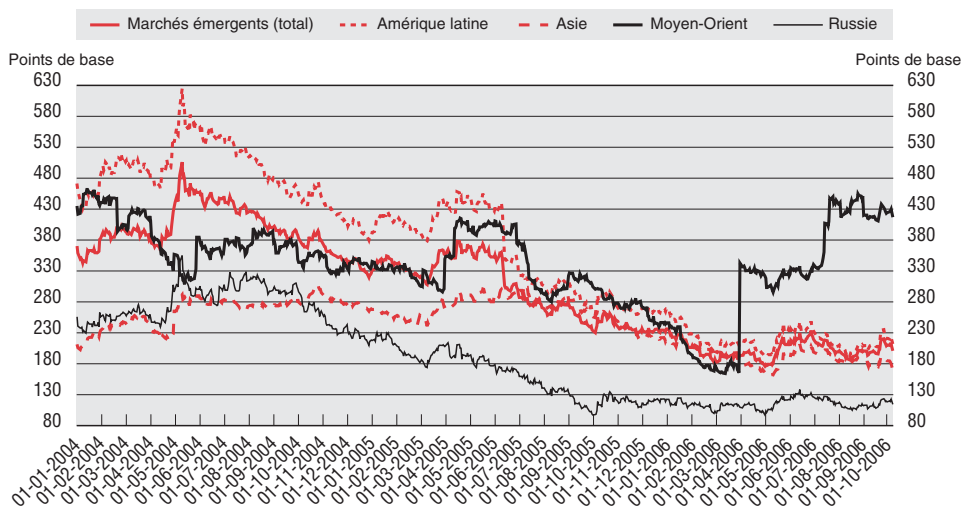
Graphique 17. **Performances boursières dans quelques économies émergentes**
Indices d'actions, base 100 au 3 janvier 2005, en dollars des États-Unis



Note : Données quotidiennes jusqu'au 6 octobre 2006.

Source : Thomson Financial Datastream.

Graphique 18. Écarts de rémunération des marchés émergents



Note : Données quotidiennes jusqu'au 6 octobre 2006. Écarts de rendement interne des titres garantis et non garantis (rendements panachés) composant l'indice EMBI Global de JP Morgan par rapport aux rendements des obligations de référence des États-Unis. L'indice EMBI Global couvre les obligations Brady, les euroobligations, les obligations négociées et les titres d'emprunt des marchés locaux libellés en dollars émis par des entités souveraines et quasi souveraines.

On notera que d'après les informations de JP Morgan, la forte chute du 10 au 13 juin 2005 de l'indice pour l'Amérique latine et donc, de l'indice total des marchés émergents est dû à un rééquilibrage au cours du mois de juin provoqué par la conversion de la dette argentine. Par suite de ce rééquilibrage, la dette argentine en situation de défaut de paiement (avec des écarts de rémunération de 5 000 points de base et plus) a été en partie remplacée par des emprunts productifs assortis d'écarts de rémunération bien inférieurs

Source : Thomson Financial Datastream.

notamment en Amérique latine, mais en ce qui concerne les marchés émergents dans leur ensemble, ils sont restés bien inférieurs aux ratios correspondants aux États-Unis et en Europe³. De plus, en volume, les révisions en hausse des notations au cours des trois premiers trimestres de 2006 sont largement supérieures aux révisions en baisse, ce qui, du fait des mauvaises performances américaines, n'est pas le cas des marchés développés. En outre, les obligations souveraines des marchés émergents ont dans l'ensemble vu la qualité des signatures s'améliorer, puisqu'on compte dans ce segment huit révisions en hausse des notations, contre deux révisions en baisse seulement au troisième trimestre de 2006. Quatre de ces révisions en hausse sont intervenues dans la région Asie-Pacifique. Les deux révisions en baisse, l'une dans la région Europe orientale, Moyen-Orient et Afrique, ont largement été compensées en volume par les révisions en hausse.

Les paramètres fondamentaux positifs expliquent aussi l'intérêt croissant que manifestent les investisseurs internationaux pour les titres des marchés émergents libellés dans la propre monnaie de l'émetteur. Derrière ce phénomène, il y a implicitement des anticipations de stabilité économique et financière durable des économies de marché émergentes, qui prévalent sur les considérations de risque, ainsi qu'une modification des points de vue traditionnels sur les faiblesses structurelles inhérentes aux marchés des économies en développement. Jusqu'ici, les nouvelles avancées du marché, l'amélioration des conditions de financement et celle de l'accès au marché pour les économies émergentes ont contribué à l'apparition d'un « cercle vertueux » qui va stimuler davantage encore le progrès économique.⁴

... et une stabilité économique et financière rassurante pour les investisseurs...

En ce qui concerne les diverses régions, en Amérique latine, l'indice Bovespa au Brésil a surperformé ces derniers mois l'indice global des actions latino-américaines, mais tout récemment il a affiché de moins bonnes performances que l'indice régional. La bonne tenue des paiements courants du Brésil rapproche le pays des notations de la catégorie investissement. Mais ses perspectives de croissance sont, comparées à celles des autres grands marchés émergents, relativement modestes. Avec ces perspectives, ainsi que le niveau encore relativement élevé des taux d'intérêt, certains investisseurs favorisent un transfert des placements en actions vers les placements en valeurs à revenu fixe au Brésil.

... en Amérique latine,...

Les investisseurs sont aussi restés confiants en ce qui concerne les investissements en Asie, malgré les difficultés récentes de la région. En Indonésie, encore sous la menace de la grippe aviaire et frappée par un tsunami en juillet, le gouvernement a annoncé début octobre qu'il allait procéder au remboursement anticipé de ses engagements restants vis-à-vis du Fonds monétaire international. Ce résultat positif a été obtenu grâce au vif redressement économique du pays et à la bonne situation de sa balance des paiements. En Thaïlande, le gouvernement a été renversé par un coup d'État militaire en septembre. Même si le bath s'est légèrement affaibli à cette occasion et si les bourses de valeurs et les banques ont fermé le jour du coup d'État, les marchés n'ont apparemment pas subi d'effets négatifs plus durables

... en Asie, malgré des difficultés récentes,...

de ces événements. Aux Philippines, un plan ambitieux de relance de la croissance économique et de réduction de la pauvreté avait été annoncé pour compléter le programme de réforme des finances publiques en vue de remédier à l'énorme dette du pays qui avait atteint 80 % de son PIB en 2004 et qui était pour moitié libellée en devises. Fin juillet, les Philippines ont réussi à placer sur le marché une émission d'obligations souveraines d'un montant de 750 millions USD.

**... et en Chine
où les réformes
se poursuivent,...**

En Chine, le renminbi s'est sensiblement renforcé fin septembre, prolongeant ainsi un redressement déjà entamé en mai. C'est ainsi que la monnaie chinoise a brièvement franchi fin septembre la barre symbolique de 7.9 CNY pour un dollar. Même si cette progression risque de ne pas durer, des réformes importantes sont en cours pour ouvrir l'économie chinoise et ses marchés de capitaux⁵.

**... mais aussi dans
la région Moyen-
Orient et Afrique
du Nord, qui offre
des possibilités
d'investissement
rentables, malgré
des risques
persistants en
matière de sécurité.**

Après un resserrement conforme à celui d'autres indices obligataires des marchés émergents, l'écart de rémunération de l'indice pour le Moyen-Orient s'est sensiblement creusé au deuxième trimestre de cette année, les investisseurs étant préoccupés par l'instabilité politique persistante dans la région, avec notamment la guerre civile en Irak et le récent conflit au Liban. En revanche, l'indice des cours des actions sur les marchés arabes qui avait connu un repli dès novembre 2005 après avoir atteint des sommets sous l'effet d'une vague de spéculation, a entamé un redressement en juillet et sa volatilité a diminué grâce aux perspectives économiques positives de la région Moyen-Orient et Afrique du Nord. Les bonnes performances de cette région sont soutenues non seulement par la cherté du pétrole, mais aussi par des réformes économiques. La libéralisation des régimes d'investissement et la modernisation des marchés de capitaux figurent en bonne place dans le programme de nombreux gouvernements de la région. Le fait que les émissions d'actions lancées à l'occasion de privatisations, en particulier dans les pays du Golfe, soient habituellement sensiblement sur-souscrites indique que ces réformes ont accru les occasions d'investissements rentables pour les investisseurs étrangers aussi bien que locaux, qui tirent ainsi parti de la richesse de la région et de son épargne locale.

Notes

1. Aux États-Unis, les postes du logement (y compris les coûts de l'énergie et le mobilier) représentent environ 40 % de l'indice des prix à la consommation, dont 23 % attribués aux loyers imputés (« Loyer équivalent pour les propriétaires de leur résidence principale ») et seulement 6 % environ aux loyers effectifs (« location de la résidence principale »).
2. Standard and Poor's, Global Fixed Income Research, *Global Corporate and Sovereign Rating Actions: Third Quarter 2006*.
3. D'après Standard and Poor's, Global Fixed Income Research, *Global Corporate and Sovereign Rating Actions: Third Quarter 2006*.
4. Voir aussi *A Virtuous Circle of Success in Sight*, commentaire par John Lipsky dans The Straits Times, Singapour, 18 septembre 2006.
5. Voir aussi l'article consacré aux réformes du secteur financier chinois dans ce numéro de *Financial Market Trends*.

Abstract: Financial System Reform in China: Discussions with Chinese Authorities

Over the past few years China has emerged as a major player in the global economy with a pivotal position in global production, trade and, increasingly, finance.

In view of China's growing importance in the world financial system, the OECD Committee on Financial Markets (CMF) held a (second) special session in April 2006 with a Chinese Delegation to discuss the situation in the Chinese financial system and on-going policies to reform and strengthen the system.

What clearly emerged from the meeting was the view that serious efforts are being undertaken by Chinese authorities to move forward with financial sector reform. Both Delegates and officials from China highlighted the gradualism that characterises the approach to financial sector reform, noting that the step-by-step approach may have been worthwhile given the complexities of the issues involved and the various interactions between financial sectors, as well as between the financial and the real sectors of the economy.

Financial System Reform in China: Discussions with Chinese Authorities*

I. Introduction and background

Over the past few years China has emerged as a major player in the global economy with a pivotal position in global production, trade and, increasingly, finance. In the context of large imbalances in world growth rates, China has helped sustain world economic expansion, especially in the Asia Pacific region. China is also an important force in global financial flows. The country is one of the world's largest recipients of FDI inflows. Moreover, China, along with other Asian economies, has been accumulating reserves, thereby supporting the present configuration of exchange rates in major OECD regions. The country is now a major investor in key asset markets, such as the international market in government securities.

While growth in China has remained strong, Chinese authorities face the issue of rebalancing the weight of different growth components. Increasingly, the authorities are replacing an earlier focus on reigning in buoyant investment with attempts to achieve better balanced growth. Many international observers have voiced unease over the potential role of Chinese growth for global financial stability, a discussion often couched in terms of the risk of a “hard landing”, that is a rapid deceleration of growth, with possible adverse spill-overs worldwide and especially across the region. Such concerns seem to have somewhat diminished, however. Nonetheless, several other issues remain, and some of them are related to the financial system in the country. For one, the limited role of capital markets

* The present article was written by Sebastian Schich, with help from Yu-Wei Hu and Gert Wehinger. It draws on notes prepared in the context of discussions with Chinese authorities and it has benefited from comments from the latter, as well as from colleagues from the China Desk of the OECD Economics Department. Yu-Wei Hu provided inputs for a discussion note on the Chinese financial system prepared by the author, and Gert Wehinger contributed to a summary monitoring note of the discussions at the meeting. Sebastian Schich and Gert Wehinger are senior economist and economist, respectively, in the Financial Affairs Division of the Directorate for Financial and Enterprise Affairs. Yu-Wei Hu is consultant for the OECD's Insurance and Private Pensions Committee.

implies that there is a concentration of financial risk in the banking sector to a much greater extent than in OECD economies.

In view of China's growing importance in the world financial system, the OECD Committee on Financial Markets (Comité des marchés financiers – CMF) held a (second) special session in April 2006 with a Chinese Delegation to discuss the potential role of China for global financial stability, the situation in the Chinese banking system and on-going policies to reform and strengthen the system.¹ The present note provides background information that was put together to guide the presentations by the Chinese Delegation and their discussions with CMF Delegates in section II. The third section summarises the presentations made by the representatives from China and the subsequent discussions at the meeting.

II. Selected issues regarding financial system reform

Potential role of China for global financial stability

China has become a major player in the global economy and the country has helped sustain world economic expansion, especially in the Asia Pacific region. The dependence of Chinese growth on investment is striking, however. Over the past few years, investment has accounted for more than 60 per cent of annual GDP growth. Even with the new revised GDP figures, China's investment as a percentage of GDP is still exceptionally high by international standards. This heavy skewness of the economy towards investment raises questions regarding the sustainability of growth.

Many international observers have voiced unease over the potential role of China for global financial stability. International observers have emphasised the need to moderate the very high rates of domestic investment and credit growth in an orderly manner so as to avoid systemic disruption. This discussion has often been couched in terms of the risk of a “hard landing”, characterised by a rapid deceleration of growth, with possible adverse spill-overs worldwide and especially across the region, although more recently concerns about a “hard landing” seem to have diminished. Growth in China has remained strong and the profitability of investment high. At the same time, inflation has remained subdued, even though the effects of high oil prices may feed through to headline inflation measures if Chinese authorities choose to deregulate oil product prices. Currently, the latter are still about 30 per cent lower than market prices. Nonetheless, high investment rates continue to be an issue and authorities are looking to dampen investment dynamics by imposing lending restrictions on certain industries – for example, residential real-estate and large industrial projects — and by raising interest rates. Also, efforts are being made to foster the contribution of domestic consumption to growth.

Authorities are developing markets for foreign exchange instruments that will support greater exchange rate flexibility. In this context, Chinese authorities have expressed their preference for a gradual approach to their long-run goal of liberalising the currency regime. This approach reflects the view that an immediate liberalisation may lead to a rapid appreciation of the Chinese Renminbi (RMB), with potentially significant adverse effects on exports and growth. In the meantime, international current account imbalances have grown, and the Chinese policy with respect to the value of the RMB has certainly contributed to this development. Arguably, the longer these imbalances persist or even grow, the more rapid and disorderly could be the eventual adjustment needed. To avoid such a scenario, however, policies probably need to be changed in several places, including measures to stimulate faster growth in Europe, higher savings in the United States and greater exchange rate flexibility in China.

China is also an important force in global financial flows. The country is one of the world's largest recipients of FDI inflows. Moreover, China, along with other Asian economies, has been accumulating reserves, thereby supporting the present configuration of exchange rates in major OECD regions. China is now a major investor in key asset markets, such as the international market in government securities. At the year end 2005, almost a third of China's foreign exchange reserves were invested in US Treasury securities, making the country the second-largest holder of these securities after Japan. In this context, a number of Chinese senior level monetary policy makers have recently publicly reiterated the need to diversify the country's foreign reserves, for example by shifting from US dollars to other currencies, *e.g.* euros. Any change in China's large investment portfolio, even if it would occur in a gradual fashion — which appears likely — could have widespread implications.

High saving rates in Asia, in general, and in China in particular have received considerable attention. For example, developments related to saving in that region have been linked to low yields on long-term government bonds in major OECD markets (hypothesis of a “savings glut”), although there are certainly a number of other important factors at play with respect to the level of long-term interest rates. For one, high confidence in the ability of central banks to maintain inflation at low and stable levels has certainly contributed to this situation. More generally, term premia seem to have declined in several major markets, although there is some uncertainty attached to the role of the different determinants of such premia. Nonetheless, high savings may have been an additional factor. Looking ahead, as the efficiency of the financial system improves, there may be less need for households to rely on high levels of saving rates.

For the Chinese financial system's reform efforts to succeed in bringing about a stable and balanced financial system in the country, banking reform needs to be

accompanied by reform measures in other parts of the financial system, including in currency markets, bond and stock markets, institutional investors, as well as by further reform measures regarding the real economy. So far, a main characteristic of the country's approach to reform has been its incremental and experimental form, whereby the reform process is being guided by some general principles rather than by a detailed blueprint. This approach has been complemented by a dual-track approach, which involves maintaining a planned track while encouraging the development of a market track in different areas. The approach has so far brought efficiency gains without causing any major casualties and generated high and relatively stable growth over an extended period.

Nonetheless, such an approach may create some risks of its own. For example, while significant reforms have been undertaken regarding the banking system, markets play a very limited role in capital allocation. At present, the limited role of capital markets implies that there is a concentration of financial risk in the banking sector to a much greater extent than in OECD economies. There are few alternatives to funneling high household savings into deposits in the banking system. The situation was exacerbated by the almost continuous drop in confidence among stock market investors in China between 2000 and 2005, although the decline was followed by a considerable rebound during 2006. Given the rapid ageing of China's population and the observation that on-going pension reforms promote an element of funded pensions, savings related to retirement-financing are likely to grow. Unless other investment alternatives for those savings are developed, they are likely to accumulate in the banking system. The latter has typically financed investment by state-owned enterprises. A continuation of this pattern would imply that investment and credit is concentrated in a few sectors, thus raising the possibility of a resurgence of non-performing loans. The economy's increasing integration with the world economy may expose the shortcoming in this reform approach, as it effectively leads to a considerable concentration of risks within only one sector of the financial system.

China has started to relax restrictions on domestic financial activity and is on the verge of a significant liberalisation of capital controls, and these measures are expected to bring about substantial benefits for its economy. They also raise challenges, as, for example, many banks have fragile balance sheets and little experience in operating as market institutions. Nonetheless, it should be noted that there are also some factors that mitigate at least some of the potential risks. For example, the balance sheets of several large institutions have improved. While the banking system as a whole is still fragile, government support of the system is high and efforts to strengthen the system by authorities are on-going. Also, China has a very strong current account position and its external debt to GDP is moderate. Hence, the risk of losing access to global markets appears to be limited.

Reform of the banking system

Background

Since the launch of the economic reform in the late 1970s, there has been awareness of the need to reform banks. As a result, Chinese banks have been gradually evolving from their passive role under central planning. While progress has been significant, past experience continues to weigh heavily as the authorities seek to encourage banks to take on the more active role in resource allocation typically performed by banks in market economies. Reflecting pervasive government ownership in the banking sector, as well as a history of support of social, regional and industrial policy and control by various levels of government, most Chinese banks were not well prepared to act in response to market signals. The pace of reform of the banking system accelerated in the mid to late 1990s when a new banking law was enacted and market-based reform measures were introduced (for an overview of the banking system see Box 1).

Moreover, a significant effort to strengthen bank balance sheets was undertaken with the sale of just under 50 per cent of non-performing loans (NPLs) from the big four state-owned banks to government-owned asset management companies (AMCs), which was financed with bank loans to the latter entities. These companies were established in 1999 with the mandate to clear up all the thus allocated non-performing loans within 10 years, *i.e.* by 2008.² The effectiveness of this initiative, however, has been brought into doubt. For one, latest official statistics show that, as of end 2005, the aggregate cash recovery rate within the four asset management companies was 21 per cent, while the total disposition rate was 67 per cent.³ The latter number means that only two thirds of the non-performing loans were recovered within the first eight years of the envisaged period of ten years. Given that the disposal of non-performing loans is likely to become more difficult as time passes, a question arises how the remaining one-third of assets will be dealt with.

The various efforts to enable banks to assume a role in credit allocation that is based on commercial criteria were only partly successful. For example, the partial separation of banking from the central government did not seem to result in increased financial discipline. The pricing of risk remained undifferentiated and banks did not appear to take enterprise profitability into account when making lending decisions.⁴ The majority of bank credit continued to flow to state-owned enterprises, even though the private sector had begun to account for more than half of the economy's total output. Furthermore, except for some of the bigger banks, the financial quality of most Chinese banks remained rather poor, with low earnings, inadequate capital, and high levels of NPLs.

Box 1. The role of the banking system in China

Most credit in China is extended through financial institutions (see also chapter 3 of the OECD Economic Survey of China, September 2005). Capital markets are much less important, although the portion of funds raised through foreign direct investment is comparatively high. Loans from financial institutions accounted recently for about three quarters of the funds raised by non-financial businesses, and more than ninety per cent of those from domestic sources. Commercial banks, comprising the four state-owned commercial banks, *i.e.* Bank of China (BoC), Agricultural Bank of China (ABC), China Construction Bank (CCB) and Industrial and Commercial Bank of China (ICBC), the 12 joint-stock banks, *i.e.* China Bank of Communications (CBC), China ITIC Bank, China Everbright Bank, Hua Xiao Bank, Guangdong Development Bank, Shenzhen Development Bank, China Merchants Bank, Shanghai Development Bank, China Industrial Bank, China Minsheng Banking Corporation, Evergrowing Bank, and China Zheshang Bank (see also Standard and Poor's, *China Top 50 Banks*, 2006), the City Commercial Banks and the foreign banks, dominate the financial institutions sector, accounting for almost three-quarters of total assets, with rural credit cooperatives, the next largest segment, accounting for slightly less than 10 per cent. Institutional investors, notably insurance companies, securities investment funds and particularly pension funds, are in an early stage of development although they are growing rapidly. Financial instruments for long-term savings and for managing liquidity and risk are quite limited compared to more advanced economies.

The extent of state ownership in China's financial system is exceptional. All but one of the major commercial banks are controlled by central or local governments, as are virtually all smaller commercial banks. The banking sector is also relatively concentrated: although the share of total assets held by the four largest banks has been declining. Banks wholly owned by the central government, the state-owned commercial banks (SOCBs), still account for almost three-quarters of commercial bank assets. Most other domestic financial institutions, including the major life insurance companies and the majority of trust and investment companies and securities companies are also owned or controlled by local governments. The main exception is the foreign financial institutions sector, whose overall share of their respective markets is small. Thus, the privatisation trend observed in most of the real economy has been virtually absent in the financial sector.

The high degree of state ownership of financial institutions has been accompanied by a dominant emphasis on lending to state-owned or controlled enterprises (SOEs) while non-state enterprises have poorer but growing access to external credit. The four SOCBs are particularly heavily concentrated in lending to SOEs, while joint stock and city commercial banks are somewhat more oriented toward non-state enterprises. The capital markets are even more the preserve of state enterprises: nearly all of the currently listed companies were state controlled at the time of their initial public offering; and non-state enterprises are also virtually absent from the corporate bond market.

Against this background, beginning in 2003, the authorities have taken a more comprehensive approach to banking reform. The authorities have been implementing a plan, which includes efforts to upgrade banking supervision practices to global standards, acceptance of competition between the state-owned banks and other categories of banks (especially joint stock commercial banks, which are commercial banks in which equity ownership is distributed among the state and other investors, most of which were created in the early 1990s), policies to encourage ownership diversification in all banks with domestic and international listings of bank equity and with sizeable foreign ownership of Chinese banks, reforms of the internal governance regime of banks, stricter requirements for transparency and more exposure to markets, and increased opportunities for foreign bank branches and subsidiaries to compete domestically. Another major step was the injection of government funds into the capital base of “pilot” state-owned commercial banks, Bank of China (BoC) and China Construction Bank (CCB). This injection, together with steps taken earlier and afterwards by the banks themselves and sales of NPLs to asset management companies, financed in part by the central bank, and sales of stakes to foreign banks has restored the financial solvency of these banks.

Recent progress

The progress made by many institutions has been reflected in the listing of financial firms on stock exchanges. Two banks, the China Bank of Communications (CBC), the country's fifth largest bank and a joint-stock bank, and the China Construction Bank (CCB), one of the four big banks, became listed on the Hong Kong Stock Exchange in June 2005 and October 2005 respectively. Since CCB's listing, the company's stocks have performed well both in absolute and relative terms. No specific dates have been officially announced as to when the remaining three of the four big banks will go public. Nonetheless, it was rumoured that the Chinese government planned to float the Bank of China (BoC) by 2006 as well as the Agricultural Bank of China (ABC) and the Industrial and Commercial Bank of China (ICBC) by 2007, with these dates being understood to be subject to revision depending on progress made in the internal re-structuring process in these banks.

Prospects for the banking sector as a whole have recently become brighter as a result of noticeable increases in their operating income and progress toward improving their cost structures, even though the profitability of Chinese banks has generally been low by international standards. Credit expansion has led to a decline in NPL ratios at all categories of banks, as newly booked loans tend to have lower delinquency ratios than existing loans. There has been a rather sizable expansion of lending to the consumer, SME and mortgage sectors. Latest statistics show that, as of 2005, 11 per cent of loans at the four big state-owned banks were classified as non-performing (with most of these loans being concentrated at ABC), while this figure stood at only 1 per cent in the case of foreign banks in China.⁵

Banks have improved their internal credit and risk management systems. Nonetheless, it is uncertain to what extent commercial principles have come to determine lending decisions and also whether the risk management systems of the Chinese banks are sufficient to deal with the various new risks. To the extent that shortcomings in these areas remain, it cannot be ruled out that there may be a new surge of non-performing loans at some future time.

Supervision of banks has been evolving along with the reform of the banking system. With the banking reform of 1995, the People's Bank of China (PBC) was charged with the responsibility for financial supervision as well as the traditional functions of central banks. With the banking reform in 2003, supervisory responsibility was transferred to the newly formed China Banking Regulatory Commission (CBRC). This decision reflected the thinking that the central bank should focus on monetary policy and systemic stability while supervision of banking institutions should be performed by a separate entity. The CBRC stated its intention of moving from the earlier compliance-based methods of supervision to a newer risk-based system, similar to those in advanced markets, which relies more on the internal governance of the bank, market discipline and transparency, and foreign participation in ownership.

Previously, the Chinese banking system operated under a system that was subject to close control by the authorities and where efforts were made to minimise the influence of the global financial market on China. The state-owned commercial banks were entirely owned by the central government and historically functioned as administrative extensions of the government. Top executives of the state-owned commercial banks were nominated by the Party and approved by the State Council. While bank management was not indifferent to the credit standing of its institutional customers, it also responded to other concerns such as supporting regional, industrial and social policies. Other domestic commercial banks were predominantly owned and controlled by local governments.

The banking reform programme reflects a willingness on the part of the Chinese authorities to relinquish some control. It postulates that, with ownership changes, the boards and management of the banks will have to respond to the interests of their bank's owners rather than act as agents of state policy. Ultimately, the banks should rely less upon the guarantees of the government and more on their own standing with the market. As a result, banks will be under great pressure to meet the expectations of financial markets, especially as they will be seeking to raise funds in the capital markets both domestically and internationally. In this context, listings of Chinese banks on overseas stock exchanges obliges them to observe stock exchange rules about disclosure, corporate governance and investor protection, which are more rigorous than Chinese rules. So far, financial institutions have chosen to be listed in Hong Kong, where listing requirements are arguably less stringent than *e.g.* in New York.

Current reforms comprise several measures to enlarge the role of foreign influence, including attempts to facilitate and expand foreign ownership in banks. For example, under a rule that became effective as of February 2006, newly registered joint stock banks need to take at least one foreign partner, although the total foreign ownership is capped at less than 20 per cent for a single investor and at less than 25 per cent for all foreign investors. Thus, these new rules reiterate those that apply to foreigners who buy into existing banks.⁶ In February 2006, the first new Chinese joint stock commercial bank in a decade was established, with a foreign firm owning almost 20 per cent.

While foreign participation in the banking system is still low by international comparison, with foreign banks reported to claim less than 2 per cent of industry assets as of mid-2005, a more extensive foreign presence is gradually developing. In keeping with China's WTO commitments and in order to increase the role of competition in the banking system, current limits on the operations of foreign branches and subsidiaries are due to be phased out by 2007, with restrictions on cross-border operations also relaxed. Foreign banks have taken equity interests in many Chinese joint stock and city commercial banks and they are expected to gain significant further equity stakes in Chinese banks as the capital base of banks is opened and as permissible foreign equity positions in specific types of banks rise.

China offers huge attractions to foreign banks owing to the size of the market, the high levels of savings and the low current levels of products and services in areas such as customer service, credit assessment and risk management. Analysts reckon that Chinese authorities welcome foreign strategic investors in the banking sector, not for their contribution of capital, which is abundant in China, but rather for their capability to transfer expertise, technology or help in exploiting a niche.

Development of capital markets

Stock markets

China's stock market capitalisation compared to the country's GDP is quite low by international standards, even though the market has developed impressively since its inception in the 1990s. In terms of gross capitalisation it is the third largest market in Asia, *i.e.* after Japan and Hong Kong, but in relative terms the market is small.⁷ Moreover, as approximately two-thirds of the shares in China are non-tradable, the effective capitalisation, measured as the value of *tradable* shares as a share of GDP is low. For example, it is in the lower portion of the range of other major Asian emerging markets. Stock market valuations have declined from 2001 to 2005, at least in part because many investors perceived a risk of the stock market being flooded with government-owned previously non-tradable

shares. In any case, strong capital markets are arguably as important as sound banking systems to the development of a healthy financial system.

Against this background, the Chinese government has placed considerable emphasis on the development of the stock market as a means of improving corporate governance, facilitating the eventual sale of state assets, and providing assets for investments of long-term savings. Much progress has been made in developing the key elements of the stock exchanges, including modern infrastructure, a reformed supervisory structure, and basic commodity and futures markets.

Nonetheless, the ability of the stock markets to perform their key functions seems to have been hampered by factors that are in part government imposed. For some time, authorities rationed new listings partly on the basis of non-commercial criteria such as the province in which the firm was located. Although this practice was officially ended several years ago and replaced with a more objective and market-based system, the market is still dominated by companies that were chosen by the older system. Also, most of the firms listed in China are state-owned (about five out of six companies), reflecting considerations by the authorities at the time of the inception of the stock market in China. When the Chinese authorities first introduced the stock market in 1990, the principal motivation was to find another financing method in addition to loans from the state-owned banks for the ailing state-owned enterprises. This approach also explains why the share of traded stock is still very low.

As regards the demand side, banks are prohibited from owning or trading equities and the authorities have also limited the portion of portfolios that insurance companies and pension funds can invest in equities. These latter restrictions are motivated by prudential concerns, given that price volatility is considerable. Nevertheless, they tend to reduce the potential influence of those investors who, elsewhere, typically have shown considerable capacity and incentives to monitor the management of listed companies and evaluate the companies' worth. Indeed, the regulation of similar institutions in OECD countries has tended to move away from quantitative restrictions.

Some observers have argued that liberalising some of the restrictions applying to institutional investors in China may also be beneficial, as some categories of institutional investors in OECD countries have typically tended to adopt more long-term investment horizons than other types of investors. In this context, there are reports that many individual investors in the Chinese stock markets appear to be driven by attempts to realise short-term capital gains. For example, a survey shows that almost 80 per cent of Chinese individual investors bought stocks motivated by potential capital gains, while only slightly more than 10 per cent of them were motivated by the prospect of receiving regular dividend payments. By

contrast, some institutional investors have mandates to adopt relatively long-term investment horizons.

Another impediment to the development of the stock market may be related to the current financial situation of investment banks and stockbrokers. While there has been considerable progress in the area of commercial banking, investment banks and stockbrokers have made little progress regarding their financial quality. As a result of the decline of the Chinese stock market between 2001 and 2005, as well as shortcomings in their own management (often reflecting poor governance), several securities companies have reported considerable losses. One company, China Southern Securities, which was once the fifth-largest securities firm, went bankrupt in 2002, and it was reported that, more recently, all but ten of these companies may be technically insolvent.

Compared to the area of commercial banking, it is somewhat less clear to what extent foreign involvement in the area of securities' business appears to be actively sought by Chinese authorities. Although the major international investment banks conduct a sizeable share of the *overseas* business of Chinese companies' listing, underwriting, and trading, the scope for such activities on the Chinese *domestic* market seems to be more limited. Regulations have made it possible to establish joint-venture fund management companies, securities companies and, more recently, commodities brokerages and trust companies. While foreign participation is generally restricted to a minority stake and subject to a limited license,⁸ the government has shown its willingness to experiment, granting exceptional approvals for higher controlling interest in a securities company by a foreign investment bank.

Bond markets

China's bond market has grown rapidly in recent years, but its overall size in relation to GDP is still small compared to those in OECD countries.⁹ The government bond market is the largest and best developed segment and has been the main focus of reforms. Considerable effort has gone into modernising market standards into better alignment with those in other countries, and these measures will also help in establishing a benchmark yield curve for the bond market as a whole. Short sales of government bonds have been authorised through the repurchase market and the institution of interest rate swaps is being considered. Nonetheless, the market is segmented, with trading taking place both in the inter-bank market, where banks are the main players but other financial institutions (*e.g.* fund managers) are also present, and on the stock exchanges, where trading is dominated by securities and insurance companies and from which banks have been excluded since 1997. This division of the market, along with the buy-and-hold strategy of banks (who are the dominant holders of bonds), has limited trading activity somewhat and liquidity in the market as a whole.

The corporate bond market has remained relatively underdeveloped, with outstanding issues accounting for less than 1 per cent of GDP. The market's development has been stunted by continued imposition of antiquated regulatory policies, mainly concerning issuance. Specifically, because of past problems, the authorities have sought to virtually avoid credit risk altogether by allowing only the financially strongest companies to issue debt and by insisting that all bonds carry an unconditional and irrevocable bank guarantee. These conditions have complicated corporate bond issuance, and may also have favoured the issuance of shares instead.

Market development has been further held back as domestic bond rating agencies are relatively unsophisticated and are sometimes subject to influence by companies or local governments, which impairs their effectiveness. At the same time, recent growth in debt-securities markets has highlighted another risk, namely that some of the firms that provide debt ratings may assign too favourable ratings in attempts to win further business. Of the more than 100 corporate bonds issued since 2005, about three quarters received the top rating of single-A-1-plus, which is associated with a very low expected default probability. Companies issuing debt must be rated by one of five local credit-rating agencies. Involvement of foreign rating companies is very limited because of what some international rating agencies describe as heavy restrictions, although many of these restrictions appear to take the form of verbal guidance from regulators rather than written rules. Indeed, there appears to be no one coherent set of regulations regarding credit ratings and no single regulator to oversee that industry.

Looking ahead, a development that may play a positive role in stimulating the growth of China's bond markets is pension reform, especially as the role of funding within the pension system is likely to grow. So far, in China, all institutional investor segments are at an early stage of development, but over the longer term, further development of the capital markets is unlikely to occur without the growth of insurance companies and pension and mutual funds. The importance of establishing institutional investors as the "leading force" in the capital markets has been explicitly endorsed in the February 2004 State Council document, following the adoption of the framework law on securities investment funds in 2003. Perhaps even more than for the banking sector, the potential benefits from opening the domestic institutional investor and security house sectors to foreign investors are high.

III. Presentations by the Chinese Delegation and subsequent discussions

Presentations by the Chinese Delegation

Ahead of the discussion with CMF Delegates, four presentations by the Chinese Delegates gave an overview of recent and current reforms in the Chinese

financial sector. A representative from the Ministry of Finance, P.R. China, introduced this round with his presentation on Recent Developments of the Financial System in China. Setting the background against which these reforms have taken place, he noted the high GDP growth (9.9 per cent p.a.), low inflation (1.8 per cent) and growing fiscal revenues. The increase in disposable income of city dwellers in (9.6 per cent) and of net income of the rural population (6.2 per cent) should bring about a shift from the current investment- and export-driven growth towards a more consumption-based growth.

Turning to the banking sector, the representative stressed the fact that the government had successfully reduced NPLs, which had been a heavy burden on banks' balance sheets. This improvement was achieved by effectively transferring a large share of NPLs to government-owned asset management companies (AMCs), established in 1999 with the mandate to clear up all the non-performing loans allocated to them by 2008. Such reforms have also helped boost solvency ratios of Chinese banks to levels close to international norms. Banking sector reform also encompasses improvements in the corporate governance of the shareholding state-owned banks through strategic investments by foreign banks and IPOs on foreign exchanges. Addressing reforms in the securities industry, the representative highlighted reforms that make state-owned shares more tradable, the establishment of a Securities Investors Protection Fund and the introduction of QFIIs (Qualified Foreign Institutional Investors, see below), and the promotion of listing of companies more generally. In the insurance industry, the ownership structure is being reformed and international listing is encouraged. The PICC Property and Casualty Company Ltd. have been listed on the Hong Kong Stock Exchange (SEHK) since 2003, and the China Life Insurance Company Ltd. has been listed on both the NYSE and SEHK since 2003. To manage insurers' investments more efficiently and explore new channels of investments, insurance asset management companies have been established.

In compliance with WTO rules (China joined the WTO in December 2001), the government abolished the restriction on business location for the insurance industry as of end-2004, and opened the door to foreign banks' local currency business. Now there are 40 foreign insurance companies, half of the total number of insurance companies in China. 71 foreign banks are now operating in China, and 173 have representative offices. On the securities markets, 20 fund management companies with foreign shares were licensed and 35 foreign institutions were licensed as QFIIs with a total investment quota of USD 5.97 billion. 38 per cent of total stock holdings are now owned by foreigners.

There have also been substantial reforms in the regulation and supervision of financial markets. Three supervisory commissions were created, and there is now a stronger focus on risk management. Company information systems are becoming

more transparent and more closely aligned with international best practice. In February, the Chinese Ministry of Finance issued regulations to bring accounting and auditing practices in line with global standards. Financial innovation, reform and opening up of the sector to foreign participation have given a major impetus to financial market development. Share and bond issuance have increased substantially, and new short- as well as long-term instruments have been created. Public confidence in financial institutions has increased. On foreign exchange markets the volume of spot trade reached USD 52 billion, and forward and swap trades are progressing apace.

A representative from the China Securities Regulatory Commission (CSRC) focused his presentation on developments and achievements in the securities market. After fifteen years of rapid development and reform efforts by the Chinese government, a total number of 1381 companies had been listed on the Shanghai and Shenzhen Stock Exchanges by the end of February 2006, with a total free market capitalisation of RMB 3,336.7 billion, a third of which (1,069.2 billion) was in tradable shares. Assets managed by institutional investors accounted for 70 per cent of the total free market capitalisation. The Social Security Fund can entrust qualified asset management institutions with securities investments on its behalf as well as invest in the securities market on its own. Insurance funds and corporate entities are also permitted to invest in the securities market. About 300 institutions, 114 securities companies and 183 futures brokerage firms were involved in the trading of stocks as of February 2006.

As far as instruments are concerned, the most common are “A” shares, *i.e.* common shares denominated in renminbi, but the government is also encouraging trading in “B” shares, domestically listed shares traded in US dollars or in shares denominated in Hong Kong dollars. There are also securities investment funds, and the bond market includes treasuries, corporate bonds and convertible bonds. Commodity futures, ETF, LOF and warrants are also present, and the CSRC is also looking into the possibility of allowing financial derivatives including index futures. In fulfilling its WTO commitments, foreign participation is allowed and encouraged. As of end of February 2006, the Shanghai Stock Exchange had 4 special members and 39 foreign firms authorised to trade B shares directly, and the corresponding figures were 4 and 19 for Shenzhen Stock Exchange. The CSRC licensed 4 securities companies and 20 fund management companies with foreign shareholders. Three joint venture securities firms (China International Capital Co., BOC International Co., and Ever Bright Securities Co.) existed already before the WTO accession.

The securities market is also opening up to overseas listings. As of end of February 2006, 125 Chinese companies had listed H-shares on the Hong Kong and other overseas stock exchanges, raising roughly USD 56 billion. Among the

123 Hong Kong-listed shares, 10 were dually listed in Hong Kong and New York, 4 dually listed in Hong Kong and London, 1 triply listed in Hong Kong, New York, and London, and 2 solely listed in Singapore. To date, 31 of these H-share companies have also issued and listed A shares domestically.

As a transitional measure in the opening-up process, the QFII (Qualified Foreign Institutional Investors) scheme was implemented in December 2002 in order to attract foreign portfolio investment. So far, the scheme has proven sound and successful and has helped to improve the structure of securities investors. To date, 35 foreign institutions have been licensed as QFIIs with a total investment quota of USD 5.97 billion, and 4 foreign banks have been licensed as custodian banks. Work on the QFII scheme will continue, and the quota will be gradually increased to attract more long-term foreign funds. A number of foreign-invested enterprises have also taken advantage of a rule promulgated in October 2001 allowing eligible foreign-invested enterprises to issue and list A shares in China. In November 2002, policies and procedures were set forth regarding the transfer to foreign investors of state-owned shares and legal entities' shares in listed companies. On 31 December 2005, measures were implemented to allow foreign investors to make strategic M&A investments (3-year minimum holding period) in listed, reformed companies (*i.e.* companies that have finalised non-tradable share reform or post-reform newly listed companies).

A further area of reform regards the gradual withdrawal of non-tradable shares. Such shares, which have a negative impact in distorting the pricing mechanism of capital markets, were the result of restructuring state-owned enterprises into joint stock companies and listing them on stock exchanges. By the end of 2004, non-tradable shares of listed companies accounted for 64 per cent of the total share capital on the domestic market, with the state owning 74 per cent and local governments the remainder of all the non-tradable shares. The view is that while reform directed at non-tradable shares should follow market rules, it has to be accompanied by a lock-up period and trading restrictions in order to guarantee market stability. The pilot program of non-tradable share reform was launched on 29 April 2005, and as of 3 April 2006, 793 companies had completed or engaged in the reform, accounting for 59 per cent of 1 348 listed companies, 66 per cent of total market capitalisation and 62 per cent of all share capital. As a result of the popularity of the programme and the positive responses by investors and listed companies, the Shanghai Stock Composite Index climbed to around 1,350 points in October, from 1,000 in early June 2005.

At the end of his presentation, the representative also noted the importance of reforms for enhancing liquidity by creating new instruments, and building trust among investors by improving corporate governance and combating financial crime, and he invited the CMF Delegates to provide comments and put forward ideas for these financial sector reforms.

Financial market developments in various sectors were presented by an official from the People's Bank of China. Noting the good performance of the bond market, she highlighted the 60 per cent increase in interbank market transactions in 2005, with the most active trading segments being overnight and 7-day instruments. The interbank bond market index had risen 8 per cent since the beginning of 2006, with a particularly strong growth in the Bankers Acceptance (BA) market. The exchange bond market increased more than 14 per cent in the same period. Bond yields declined slightly, and the yield curve is inverted at the very long end of the maturity spectrum. This was explained by structural problems, with relatively few bonds existing in the 20 to 30-year segment, and specific regulations which influence the yield on medium and long-term bonds. At the short end, the strong competition in the BA market drove down interest rates. Stock markets have also been buoyant, and enterprises increasingly receive financing from overseas investors. One of the driving factors has been the insurance industry, which, after having improved its own governance structures, has been investing more heavily in securities compared with the not-so-distant past, when bank deposits accounted for a large share of the sector's assets.

In order to promote the development of the money and bond market, new products have been introduced, like short-term enterprise financing bills (in 2004) and asset-backed securities. The latter were developed also with the help of the World Bank, which over the past 5 or 6 years has given its advice to Chinese authorities on developing the bond markets. Furthermore, companies' reputations now play a larger role in investors' decisions, as there is more transparency and more market-based valuation of financial products. Various reforms have also been introduced to promote the foreign exchange market and support the RMB exchange rate regime reform. The areas in which banks can operate in this market have been broadened, and now non-financial companies are also allowed to participate. Among the various measures were the introduction of new instruments, OTC transactions, and a market maker system. As mentioned by the previous speaker, the non-tradable share reform and securities companies' restructuring made some headway and remaining difficulties are being overcome.

The focus of the fourth presentation, by a representative from the China Banking Regulatory Commission (CBRC), started out with an overview of the structure of the Chinese banking system, which consists of more than 30,000 institutions, including 3 policy banks, 4 state-owned commercial banks (SOCBs) and 13 joint-stock commercial banks (JSCBs). Rural credit cooperatives are the biggest in number (30,438). With the opening up of the banking sector, as of the end of October 2005, 173 foreign banks from 40 countries and regions had set up 238 representative offices in 23 cities in China, and there are also 238 operational entities of 71 foreign banks from 20 countries. Foreign banks' assets amount to 2 per cent of the total banking assets in China, and they cover 20 per cent of all foreign currency loans extended in China.

Banks' assets have grown strongly, and the reforms of commercial banks have achieved significant progress. The goal of the reforms is to make these banks internationally competitive, enhance corporate governance, strengthen the capital base, and improve risk management as well as internal controls, and so far has resulted in improved financial conditions and the listing of one of the four large reforming banks (China Construction Bank, CCB) and one joint stock bank (Bank of Communications). The functions of policy banks (China Development Bank, Agriculture Development Bank of China and Export-Import Bank of China) are being redefined and new legislation in this regard is being drafted.

Turning to rural credit cooperatives, which are spread out over 30 provinces, reforms in this sector have led to a more decentralised structure since responsibilities have been transferred to provincial governments. Financial accessibility in rural areas has improved significantly and credit extension by rural cooperative financial institutions has increased, in particular, in the form of loans for rural households which grew almost 80 per cent from end-2002 to end-2005. Such loans are now satisfying the needs of 7000 rural households, 60 per cent of the total in need. Non-performing loans of rural cooperative financial institutions dropped RMB 189.2 billion from end-2002 to end-2005, with the major part of the decline happening in the course of 2005 (RMB 125.9 billion). The NPL ratio fell 8.3 percentage points in the course of 2005 and 22.1 percentage points from end-2002 to end-2005, to 14.8 per cent.

Discussion with CMF Delegates

Exchange rates and interest rates

Part of the discussion that followed the formal presentations focused on developments regarding exchange rates and interest rates. One CMF Delegate noted that the reform of the Renminbi exchange rate regime is progressing smoothly. He suggested that market participants seem to think that it may take fewer than ten years for the currency to become fully convertible, and then asked the Chinese Delegation about their outlook for the pace of future exchange rate liberalisation. The Chinese Delegation responded that there are no specific deadlines regarding the liberalisation of the currency regime. The pace is somewhat uncertain, but what is clear is the ultimate aim, which is to achieve full currency convertibility. In this regard, major reforms were implemented during 2005. Chinese authorities do not peg the renminbi to the US dollar alone, but they use instead a basket of currencies as a reference. China's Central Bank will publish a central rate around which the US dollar, which is one of the currencies included in the basket, may fluctuate within a specific range.

Responding to a question from another CMF Delegate about the reasons for the decline in bond interest rates, the Chinese Delegation said that this develop-

ment reflected both declining activity on stock markets, and hence a possible shift of investments from equity into bonds, as well as ample (new) saving. In response to a question from a CMF Delegate about the process of interest rate liberalisation, the Chinese Delegation explained that the liberalisation is on-going, but that the current system is still highly complex and, currently, there is no one single rate that serves as the central bank's policy rate. The central bank still determines deposit and loan rates, but the aim is to move to a market-based system in which the central bank would exert a more indirect influence. The Delegation stressed that any liberalisation measures would be implemented progressively.

Commercial banks and non-performing loans

One CMF Delegate questioned the usefulness of asset management companies as a means to address the reduction of NPLs. The Delegation wondered whether it would not be more beneficial to let banks develop expertise in dealing with such loans, as such expertise might also reduce the chances of these institutions accumulating additional NPLs in the future. The Chinese Delegation responded that the so-called carve-out system is indeed not ideal, but that there is no viable alternative, as banks simply seem to be unable themselves to deal with the stock of NPLs. The goal of current reform measures is for banks ultimately to be able to deal with non-performing loans themselves. Looking ahead, the Delegation added that asset management companies will operate increasingly by using market-based principles in pricing and disposing of NPLs. Responding to a question from a CMF Delegate regarding the situation and outlook for NPLs at rural banks, the Delegation from China said that considerable progress has been made and that the rate of NPLs has been brought down to 15.9 per cent recently, as compared to more than 35 per cent in 2000.

Another CMF Delegate noted that state ownership of banks implies that, even when these entities are listed on stock exchanges, their stock market valuation would reflect the expectation of government support. The Delegation wondered what the plans of Chinese authorities are regarding the privatisation of state-owned banks. The Delegation from China responded that two banks are already listed on stock exchanges. There are plans to list another three banks and, in the case of two of them, ownership restructuring, which is a precondition for listing, has almost been completed. No specific timetable exists, however.

Another CMF Delegate noted that there was a considerable gap between the high volumes of deposits and relatively low volumes of loans at banks and wondered about the possible explanations for this gap. The Delegation from China confirmed this observation and added that the gap had widened even further during 2005, with the amount of loans being 30 per cent smaller than that of deposits. The Delegation conjectured that developments regarding loans may be important in explaining the growing gap. New loans are mostly concentrated at the

state-owned commercial banks that operate increasingly on the basis of criteria of commercial viability, and they may have become more prudent recently. Also, the efficiency of loan application processing, especially at banks other than the state-owned commercial banks, is still not up to international standards, with the result that loan demand cannot always be met fast enough. The Delegation added that part of the surplus deposits are channelled into the bond market, thus adding to the downward pressure on interest rates in this market. Open-market operations in the form of issuance of additional bonds have helped to relieve that pressure.

Securities markets

Responding to questions from CMF Delegates about the developments of securities markets, the Chinese Delegation acknowledged that corporate financing was still very heavily dependent on bank loans, and that this situation has changed little over the past decade. To reduce the concentration of risk in the banking sector, Chinese authorities are placing a sharper focus on the development of equity financing of non-financial corporations. In this context, disclosure and accounting standards are becoming increasingly aligned with international ones. Foreign financial institutions will have an important role to play in securities markets. In this context, the Delegation noted that five foreign banks have been allowed to do derivatives business.

Concluding remarks

The presentations and the discussion were arguably too comprehensive and multifaceted to be distilled into one single policy conclusion. But what clearly emerged from the meeting was the view that serious efforts are being undertaken by Chinese authorities to move forward with financial sector reform. Both CMF Delegates and officials from China highlighted the gradualism that characterises the approach to financial sector reform, noting that the step-by-step approach may have been worthwhile given the complexities of the issues involved and the various interactions between financial sectors, as well as between the financial and the real sectors of the economy. CMF Delegates remarked in this context that it would be interesting to further explore the nexus between the functioning of the financial sector and that of the real economy. Currently, a strong growth environment puts the financial sector in a favourable position. But the financial system, and perhaps especially the banking system, may come under renewed stress should growth falter. Hence, the question arises as to the resilience of the banking system to a downturn in the real economy. This issue and other questions could be addressed at some future point in time by the CMF, for example, in another special session with Chinese authorities.

Notes

1. Delegates at the October 2004 meeting of the Committee on Financial Markets (CMF) agreed that it would be appropriate to invite a delegation from the People's Republic of China to exchange views about the reform of the financial system in China and its possible impact on global financial markets. In response to this invitation, a Chinese Delegation comprising the major agencies responsible for the banking system attended a special session with CMF Delegates during the Committee's meeting on March 17, 2005 held at the Federal Reserve Bank of New York, New York. The Committee agreed to revisit the topic of financial reform in China in the future. As part of such efforts, the Chair of the OECD's Committee on Financial Markets, on behalf of the CMF, extended an invitation to Chinese authorities to a second special meeting between the Committee and a Chinese Delegation. In response, a Chinese Delegation consisting of officials from the Ministry of Finance, the People's Bank of China, China Banking Regulatory Commission and the China Securities Regulatory Commission attended a special session with CMF Delegates at the CMF meeting in April 2006.
2. Each AMC is designated one state-owned bank and the parings are Oriental Asset Management – Bank of China, Great Wall Asset Management – Agricultural Bank of China, Cinda Asset Management – Construction Bank of China, and Huarong Asset Management – Industrial and Commercial Bank of China.
3. Data are from the China Banking Regulatory Commission, "NPLs disposition and recovery statistics", 2006. The *cash recovery rate* is defined as the cash recovered as a percentage of the book value of disposed assets. The *disposition rate* is defined as the sum of cash and non-cash recovered as a percentage of the book value of disposed assets since the establishment of these four asset management companies in 1999.
4. See also Podpiera, R., "Progress in China's Banking Sector Reform: Has Bank Behavior Changed?", IMF Working Paper WP/06/71, March 2006.
5. China Banking Regulatory Commission, "NPLs summary 2005 within commercial banks", 2006.
6. Note that Chinese authorities have given a preference to so-called "strategic investors", which are defined by the fulfilment of various requirements including *a*) minimum of 5 per cent ownership, *b*) minimum 5-year holding period, *c*) foreign director(s) appointment, *d*) ownership in a maximum of two Chinese banks, and *e*) technology and network support (see Shuang-Ning Tang, deputy chairperson of the China Banking Regulatory Commission, "Speech on China Forum 2005", Beijing, 2 November 2005, available at www.cbrc.gov.cn/mod_cn00/jsp/cn004002.jsp?infoID=1697&type=1). As of 2005, 18 foreign financial institutions participated as "strategic investors" in the ownership of 16 state-owned (including *e.g.* Bank of China and China Construction Bank) and joint-stock banks (*e.g.* China Bank of Communications and China Everbright Bank).

7. See also chapter 3 of the Economic Survey on which this section draws.
8. Up to January 2006, there were 20 joint ventures between Chinese domestic securities firms or fund managers and foreign investors (China Securities Regulatory Commission, *Statistics on fund managers in China*, 2006). In this context, note that since 2001, many former securities firms have been restructured and transformed into fund managers, after having received capital injections from the central or local government or state-owned enterprises or other banks.
9. OECD-China co-operation on public debt management and government bond markets is part of the newly established medium-term programme of co-operation between the OECD and the Chinese Ministry of Finance on Public Debt Management and Development of Government Securities Markets in China. The programme is financed by a grant of the Japanese government. The Forum creates a policy platform for Chinese debt managers, debt market regulators, central bankers and other financial policy makers to discuss the policy issues involved in the development of Chinese public debt management and government debt markets. A key objective is to increase the Chinese institutional capacity to manage its public debt, including the related development of its government securities market via sharing and learning from OECD country cases and best practices. A related objective is to create awareness of the major policy issues in developing these markets, and to discuss the role of policymakers and private sector in developing efficient public and corporate bond markets.

Résumé : La réforme du système financier en Chine : discussions avec les autorités chinoises

Ces dernières années, la Chine est devenue l'un des grands acteurs de l'économie mondiale et elle occupe une position centrale dans la production, les échanges et de plus en plus, la finance à l'échelle mondiale.

Compte tenu de cette importance croissante dans le système financier mondial, le Comité des marchés financiers (CMF) de l'OCDE a organisé en avril 2006 une (deuxième) session spéciale avec une délégation chinoise pour examiner la situation du système financier chinois et les mesures en cours pour réformer et renforcer ce système.

Ce qui est clairement ressorti de ces entretiens, c'est le sentiment que de sérieux efforts sont déployés par les autorités chinoises pour faire avancer la réforme du secteur financier. Les délégués du CMF comme les représentants de la Chine ont souligné la démarche progressive qui caractérise la réforme du secteur financier, notant que cette approche pas à pas a sans doute été judicieuse compte tenu de la complexité des problèmes posés et des diverses interactions entre compartiments du secteur financier et entre la sphère financière et la sphère réelle de l'économie du pays.

Abstract : The SME Financing Gap: Theory and Evidence

Many commentators have postulated a “financing gap” for small and medium-sized enterprises (SMEs), meaning that there are significant numbers of SMEs that could use funds productively if they were available, but cannot obtain finance from the formal financial system. This article summarises an OECD report (OECD, 2006) on this topic which seeks to determine how prevalent such a gap may be – both in OECD countries and non-member economies – and recommends measures to foster an improved flow of financing to SMEs.

The SME Financing Gap: Theory and Evidence

Summary

I. Background

At the 2nd OECD Ministerial Conference on SMEs held in Istanbul, Turkey, in June 2004, Ministers recognised in the Istanbul Ministerial Declaration “the need to improve access to financing for SMEs on reasonable terms [...]”. Ministers underlined the importance of this issue by encouraging the OECD to organise a thematic conference for further discussion to seek more innovative solutions and initiatives for facilitating SME access to financing, from firm creation through all stages of development.

The high-level OECD Global Conference on “Better Financing for Entrepreneurship and SME Growth”, hosted by the Brazilian Government (Brasilia, 27-30 March 2006) in the framework of the OECD *Bologna Process on SME and Entrepreneurship Policies*, provided an occasion to achieve these objectives. At that conference, a keynote paper on the SME Financing Gap was presented and discussed which provided the basis for a report being published on the responsibility of the Secretary-General of the OECD (*The SME Financing Gap (Vol. 1): Theory and Evidence*, OECD 2006*). The following is the executive summary of the report, which analyses the financing gap, discusses challenges of debt financing of SMEs and perspectives for venture capital financing, draws conclusions and gives recommendations on how to foster SME financing.

II. Executive Summary

Many commentators have postulated a “financing gap” for small and medium-sized enterprises (SMEs), meaning that there are significant numbers of SMEs that could use funds productively if they were available, but cannot obtain finance from the formal financial system. The OECD report on the SME financing gap, which is summarised here, analyses the “financing gap” concept, seeks to determine how preva-

* Please also see *The SME Financing Gap (Vol. II): Proceedings of the Brasilia Conference, 27-30 March 2006*.

lent such a gap may be – both for OECD countries and non-member economies – and recommends measures to foster an improved flow of financing to SMEs.

SMEs and entrepreneurship are now recognised world-wide to be a key source of dynamism, innovation and flexibility in advanced industrialised countries, as well as in emerging and developing economies. SMEs constitute the dominant form of business organisation world-wide, accounting for over 95 per cent and up to 99 per cent, depending on the country; they are responsible for between 60-70 per cent net job creation in OECD countries and make important contributions to innovation, productivity and economic growth. If the SME sector does not have access to external funds for investment, the capacity to raise investment per worker, and thereby improve productivity and wages, is seriously impaired.

The difficulties that SMEs experience can stem from several sources. The domestic financial market may contain an incomplete range of financial products and services. The lack of appropriate financing mechanisms could stem from a variety of reasons, such as regulatory rigidities or gaps in the legal framework. Moreover, development economists increasingly accept the proposition that, due to monitoring difficulties such as principal/agent problems and asymmetric information, suppliers of finance may rationally choose to offer an array of financial services that leaves significant numbers of potential borrowers without access to credit. Credit rationing is said to occur if: 1) among loan applicants who appear to be identical some receive credit while others do not; or 2) there are identifiable groups in the population that are unable to obtain credit at any price. Owing to their inherent monitoring problems, SMEs will be at a particularly severe disadvantage relative to larger and more established firms. SMEs' difficulty in obtaining financing will be compounded when the business environment lacks transparency, when the legal system is weak, and when monopolies are present. As well, loan originators may avoid providing financing to certain types of SMEs, in particular, start-ups and very young firms that typically lack sufficient collateral or firms whose activities offer the possibilities of high returns, but at a substantial risk of loss.

In a competitive market, suppliers of finance have powerful incentives to overcome barriers to SME finance. In most OECD countries, banks perceive SME finance as an attractive line of business and thus have developed effective monitoring techniques. Whether any country experiences a financing gap will ultimately depend upon whether the business environment is sufficiently robust to enable borrowers and lenders to interact with confidence on an "arm's length" basis.

In order to determine how widespread the "financing gap" problem is, the OECD Secretariat circulated a questionnaire to officials in all member countries as well as to a large number of non-members (over 100 economies in all) to gain some insights into factors influencing the provision of financing to the SME sector.

Much of the information sought is of a qualitative nature, and thus, the results of this survey along with related information (*e.g.* national surveys and development finance analyses), even when complete, permit only some tentative conclusions. The experience of OECD and non-OECD economies with SME financing gaps can be divided into three groups:

1. OECD countries do not report any generalised SME financing gap. Most SMEs in OECD countries are able to obtain sufficient credit from banks and other credit institutions, supplemented in some cases by a modest volume of official guarantees.
2. Most non-OECD economies, by contrast, report a widespread shortage of SME finance. Even though SMEs typically account for a large share of enterprises, employment, and output in many emerging and developing countries, they receive a very low share of credit, with the majority often denied any access to the formal markets. This development is closely related to the phenomenon of “informality” in emerging markets in which many enterprises operate outside the formal system. There are three factors favouring informality: 1) established financial institutions are not interested in dealing with SMEs and, hence, there are few positive incentives to operate transparently; 2) entrepreneurs in SMEs seek to avoid regulation and taxation in the formal sector; and 3) governments lack the administrative capacity to enforce laws and regulations.
3. Most OECD countries perceive that a lack of appropriate financing has been a hindrance to the expansion of innovative SMEs (ISMEs), *i.e.* firms, often in technology sectors, with new business models and high growth prospects. In a small number of countries the ISME sector has expanded significantly, with positive implications for employment and technological competitiveness, but it has lagged considerably in most OECD countries, producing a gap to which policy makers often attribute low job creation and sagging competitiveness. Many OECD countries consider this gap to be an important challenge for policy.

Banking and credit

In most jurisdictions commercial banks as a group are the main source of external finance for SMEs. Therefore, it is essential that the banking system be prepared to extend credit to the SME sector. However, there are a number of rigidities of a macroeconomic, institutional and regulatory nature that may bias the entire banking system against lending to SMEs. Macroeconomic policies may lead to excess demand for available domestic savings, while government policy may favour industrialisation and/or import substitution, which effectively gives large

domestic firms privileged access to finance. The legal system may not provide adequate protection for rights of creditors and may be relatively inefficient in resolving cases of delinquent payments and bankruptcy. Additionally, the tax and regulatory framework may encourage firms to operate opaquely. Furthermore, the financial market may not contain the necessary range of products and services to meet the needs of SMEs.

The characteristics of the banking system in emerging markets frequently inhibit SME lending. In many cases, many banks are state-owned. Histories of sub-standard lending may leave many banks with weak balance sheets. Significant shares of total credit are often allocated on the basis of government guarantees or under special programmes to support targeted sectors. Banks may also be subjected to interest rate ceilings that make it difficult to price credit to SMEs to fully reflect the risk of lending to SMEs. In many countries the authorities have been reluctant to allow banks to fail and the banking system was supported by implicit or explicit government guarantees. Many banks may have ownership and other ties to industrial interests and, thus, tend to favour affiliated companies.

If the banking system has possibilities to earn acceptable returns by lending to other borrowers, it will not develop the skills needed to do SME lending. If the formal banking system shows little inclination to lend to SMEs, there is little incentive for firms to produce credible accounts and operate transparently.

On a global level, a model of market-based banking has gained acceptance under which banks' management and boards are accountable for achieving high returns to shareholders and maintaining high prudential standards. As this model is applied and as the business environment becomes more competitive, banks have stronger incentives to find means to overcome the difficulties in SME lending. However, many emerging markets have been comparatively slow in implementing this model, which may be reflected in low volumes of SME lending. Lending to the SME sector would still be, in any case, subject to agency problems and the phenomenon of incomplete markets.

The fact that SMEs in many emerging markets do not have access to bank financing is especially worrisome because SMEs typically employ a large share of the labour force and account for a large part of national income.

By way of contrast, banks in the most advanced countries are adopting strategies to reduce the risk of lending to SMEs. They are investing considerable resources in seeking to overcome information asymmetry problems by using credit scoring models and other sophisticated techniques to discriminate between high and low-risk borrowers. These lending mechanisms enable banks to identify businesses likely to survive and expand, and with which it is worthwhile to develop a long-term relationship. Banks are also altering the nature of their prod-

ucts. An increasing proportion of bank revenue now comes from fees for services, which favours lending to entities such as SMEs.

Governments of OECD countries are convinced that there are still enough instances of market failure in SME finance to justify government intervention. Thus, countries have launched a number of programmes to utilise public funds in order to facilitate SME lending. Official surveys at the national level or on a cross-country regional basis suggest that the efforts of banks to develop the SME market, supported in some cases by a moderate amount of government guarantees, have resulted in a situation in which a large share of SMEs have access to bank finance. It is worth mentioning that in most cases the volume of funds supplied under official programmes is modest in comparison to that supplied by banks at their own risk.

Risk capital

Nonetheless, there are, as noted previously, still problems in directing funds to certain other categories of SMEs, particularly ISMEs. They include start-ups and very young firms in all categories and those in riskier endeavours in particular. Providing adequate finance to such SMEs is a challenge in a broad range of countries. Traditional bank finance is of limited relevance to ISMEs, which usually have negative cash flows, untried business models and high risk. Instead, investors provide risk capital through equity and quasi-equity products (*e.g.* “mezzanine finance” and “hybrid products”). The investor can assume high risks, but may also reap large rewards. Unlike traditional listed equity investments, ISMEs will usually progress through several stages of private equity (*i.e.* not listed on stock exchanges or subject to full formal regulation) finance adapted to their special needs.

Geographic proximity is a factor in ISME development in the sense that investors need ongoing communication with technical innovation, innovative entrepreneurs and the marketing plans of competitors. Therefore, these investors, like the entrepreneurs they support, tend to locate near “technology clusters” in areas near universities and other research facilities. The trend toward concentration is often reinforced by policies to locate “science parks” and “business incubators” near research facilities. Some of these facilities are supported only by private funds but most use public funds as well.

The ISME typically proceeds through several stages, from “seed” before production has begun through an “early stage” and then one or more “expansion” or “development” rounds. ISMEs require a range of financing vehicles as they progress through the life cycle, and investment at any stage of the life cycle is frequently contingent on there being some potential to advance to the next stage.

Initially, the company has no financial statements or track record, which limits its suitability for external financing. Consequently, funds are initially raised from close personal or professional acquaintances. Early-stage funding can also take the form of government funds such as grants or seed capital funds, which can be partnered with funds from universities, endowments and local authorities. These funds are mostly used for the development of product prototypes and feasibility studies.

“Business angels”, individuals who commit business experience as well as their own capital, often play key roles in the formative stages of a firm's life. The role of business angels in early-stage finance appears to be growing and is increasingly recognised as a vital link in the financing chain. It is also an area where government technical support may have a very high payoff.

Venture capitalists, which often enter the firm at the middle to later stages of its life cycle, provide a link between the SME and institutional sources of capital. Funds are usually obtained from institutional investors, especially pension funds, but financial intermediaries and the corporate sector, as well as the official sector, are also major investors. At the end of the process the venture capitalist aims to realise a return on the investment through “exit” via trade sale or a public issue (initial public offering, *i.e.* IPO). While trade sales are much larger than IPOs in volume terms in almost all instances and places, IPOs are important in establishing valuation and in setting standards to which newer companies can aspire.

The sharply varying levels of development of SME sectors in OECD countries and worldwide makes it imperative for those countries where the sector is lagging to review and reform their entire frameworks for entrepreneurial finance.

Conclusions

- A lack of data impedes a complete analysis of the financial situation of SMEs in OECD and non-OECD economies.
- Financing gaps are more pervasive in emerging markets than in OECD countries, but many OECD countries have financing gaps for ISMEs.
- The overall macroeconomic legal, regulatory and financial framework is the critical determinant of SMEs' access to finance.
- SMEs have significant gaps in the information and skills needed to access external finance.
- The modern market-based model of banking is more likely to work to the advantage of SMEs than highly controlled banking that is closed to foreign competition.

- Emerging economies need to strengthen incentives for SMEs to move into the formal sector.
- An effective framework for research-commerce linkages is a critical precondition for effective ISME finance.

Recommendations

- Governments can play an important role in supporting the SME sector, in particular, in cases of market failures and incomplete markets that inhibit the provision of adequate financing or financing on terms suitable for the stage of SME development.
- Government measures to promote SMEs should be carefully focused, aiming at making markets work efficiently and at providing incentives for the private sector to assume an active role in SME finance.
- Public policy should improve awareness among entrepreneurs of the range of financing options available from official programmes, private investors, and banks.
- The principle of risk sharing should be observed, committing official funds only in partnership with those of entrepreneurs, banks, businesses or universities.
- The tax system should not inadvertently place SMEs at a disadvantage.
- Where necessary, banking systems should be reformed in line with market-based principles.
- Governments should determine whether the market for informal risk capital (often described as “business angels”) can be made to operate more efficiently through government technical support.
- National policies should encourage diverse forms of institutional savings and institutional investors should be regulated flexibly.
- The market for corporate control should be allowed to function efficiently for both domestic and foreign entities.
- The legal, tax and regulatory framework should be reviewed in order to assure that the environment encourages the development of venture capital, including opportunities for exit.

Résumé : Le déficit de financement des PME : Principes et réalités

De nombreux commentateurs ont postulé l'existence d'un « déficit de financement » des petites et moyennes entreprises (PME), ce qui signifie qu'un nombre important de PME pourraient utiliser des fonds de façon productives si elles pouvaient en disposer, mais ne peuvent pas obtenir des financements auprès du système financier officiel. Cet article fait la synthèse d'un rapport sur ce thème (OCDE, 2006) qui cherche à déterminer l'importance réelle d'un tel déficit – aussi bien dans les pays de l'OCDE que dans les économies non membres – et recommande des mesures pour améliorer les flux de financement au profit des PME.

Abstract: Factors behind Low Long-Term Interest Rates

Long-term bond yields have been low in recent years both in nominal and real terms, and – especially in the United States – they have reacted differently to shifts in monetary and fiscal stances relative to previous cycles. This article examines various possible explanations for this behaviour, such as the effects of changes in monetary policy frameworks on inflation and interest rate expectations; developments in *ex ante* saving-investment balances, and shifts in investors' portfolio preferences (including official reserve accumulation, “petro-dollar” recycling and pension fund demand for longer maturities). The article concludes that it is unlikely that any individual explanation can account for the level and profile of bond yields in recent years, but that an important element has been a compression in term premia, together with shifts in expected short rates. Even though bond yields have started to rise in the early part of 2006, they are unlikely to go back to the levels that prevailed in the 1980s or the early 1990s, as several of the factors that drove them lower are set to persist.

Factors behind Low Long-Term Interest Rates*

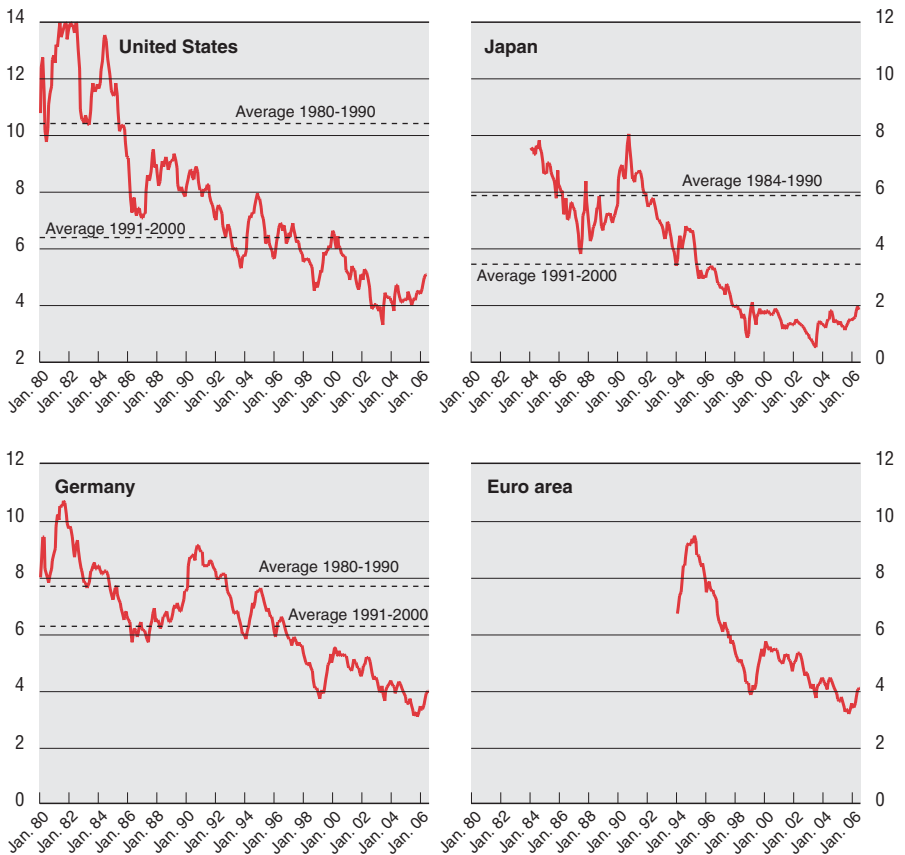
I. Introduction and main findings

Whether and for what reasons long-term bond yields are low and the chances of them rebounding are hotly debated topics. In mid-2006, nominal yields on 10-year government benchmark bonds stood at slightly above 5 per cent in the United States, around 4 per cent in the euro area and just under 2 per cent in Japan. For both the United States and the euro area, this made for real yields of somewhat above 2½ per cent if measured net of core CPI inflation or around 2 per cent measured relative to long-term inflation expectations. In Japan, real rates were above 1½ per cent, but only slightly above zero when factoring in long-term inflation expectations. Three aspects of the behaviour of long rates stand out as requiring explanation:

- Current interest rates, both in nominal and real terms are considerably lower than in the 1980s and the 1990s (Figures 1 and 2). This may reflect a process of reversion to a longer-run norm, perhaps related to the fact that financial markets have gone through an extended period of disinflation, with inflation “surprises” on the downside (Figure 3). Taking a longer view, Figure 4 shows that the 20th century average for 10-year US high-grade corporate and municipal bonds was only slightly above 2½ per cent in real terms. But at the same time, long rates have also apparently failed to react to the deterioration in the structural budget situations in the three major economies, particularly in the United States.¹

* This article was prepared by Rudiger Ahrend, Pietro Catte and Robert Price and is based on the Economics Department's Working Paper No. 490 (June 2006). The authors are respectively members and head of the Monetary and Fiscal Policy Division of the Economics Department. The views expressed are those of the authors and do not necessarily reflect those of the OECD. They are grateful for helpful comments given by Mike Feiner, Jørgen Elmeskov, Jean-Philippe Cotis, other members of the Economics Department, various members of the OECD Ad Hoc Group of High Level Monetary Experts and Jonathan H. Wright. They have been heavily reliant on statistical assistance given by Laure Meuro, Catherine Lemoine and Debra Bloch and on secretarial assistance from Paula Simonin, Sandra Raymond and Veronica Humi.

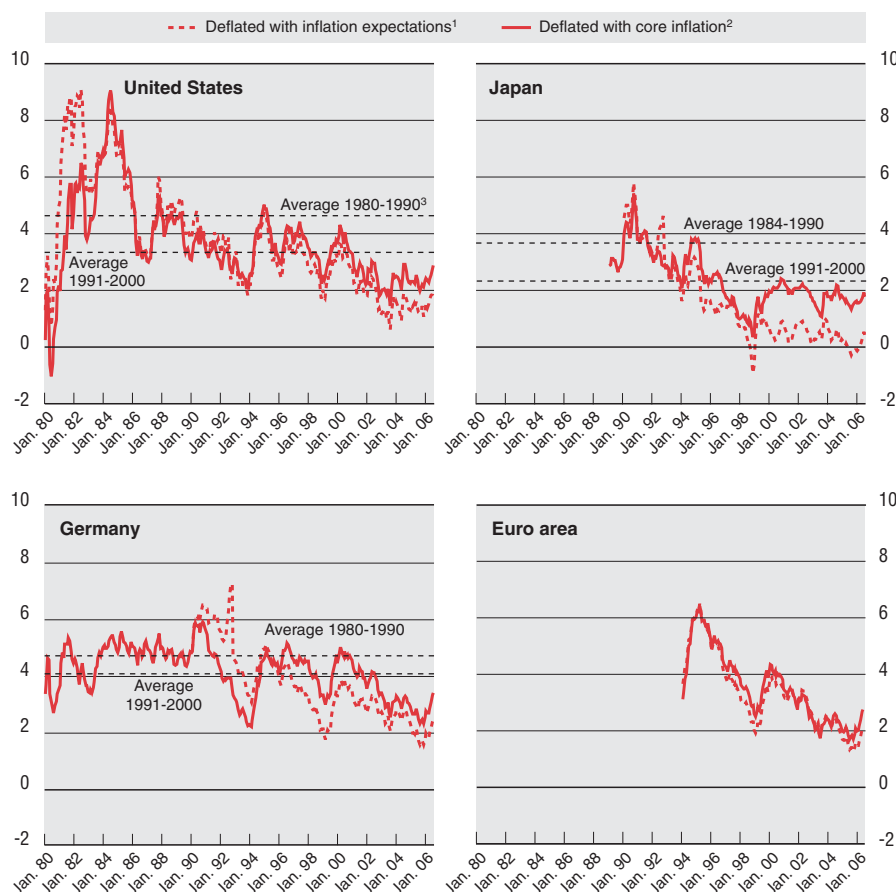
Figure 1. Nominal long-term interest rates



Source: OECD.

- Bond yields seem to be low relative to short rates and have been reacting differently to shifts in monetary and fiscal stances relative to previous cycles, particularly in the United States. While they fell during the 2001-2002 downturn in parallel with the marked easing of policy rates, in February 2006 ten-year bonds were still trading at roughly the same level as at the start of monetary tightening in 2004, whereas the intervening increase in policy rates had been 3½ percentage points. Forward rates at a ten year horizon initially fell as short-term interest rates rose, and by early 2006 the yield curve had become virtually flat (Figure 5). In the euro area, also, the yield curve had flattened, albeit in the face of only two intervening increases in policy rates. In Japan, long rates have reacted only very modestly to the improved economic outlook and the end of quantitative easing policy.

Figure 2. Real long-term interest rates



1. Inflation expectations: for USA, 5-10 years ahead, from University of Michigan, Survey of Consumers; for Japan, Germany and euro area, 6-10 years ahead, from Consensus Forecasts.

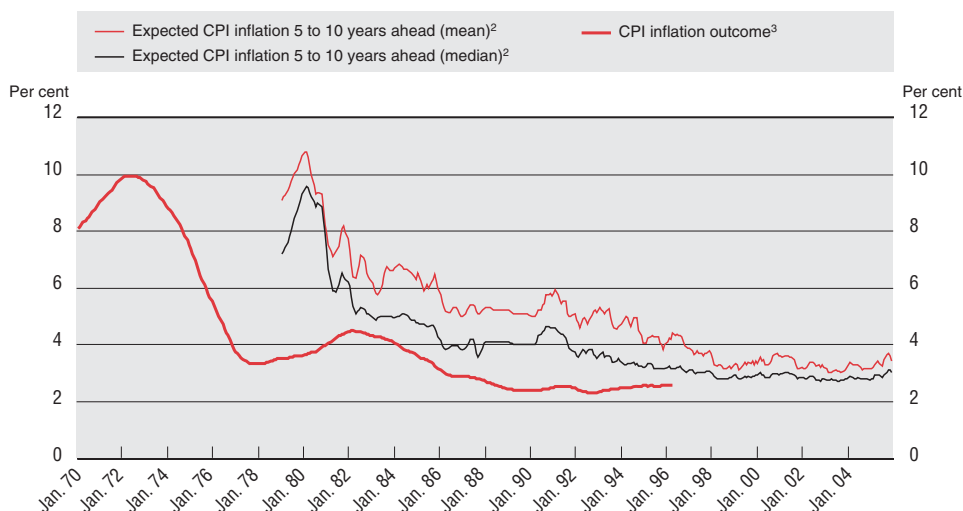
2. Real rate calculated as nominal rate less HP filtered CPI core inflation.

3. All shown averages are for core inflation deflated real interest rates.

Source: OECD, University of Michigan Survey of Consumers, Consensus Forecasts.

- Real interest rates have been low over almost all classes of long-term bonds. Risk premia on corporate debt declined globally after the stock market crash and have remained below historical averages (Figure 6). Yields on higher risk bonds (such as high-yield or emerging market bonds) are historically low compared with earnings/price ratios, indicating falling risk premia relative to equities (Figure 7).

Figure 3. **Historical long-term inflation expectations versus actual inflation outcomes in the United States**



1. This chart examines the degree to which long-term inflation expectations have been validated by reality. For a given year, it shows the expectation of inflation at a 5 to 10 year horizon (compiled from consumer surveys at the time), as well as the inflation that was actually observed during the corresponding future period (i.e. the average inflation rate 5 to 10 years ahead).
2. 3-month moving average.
3. 5-year average, 5 years forward.

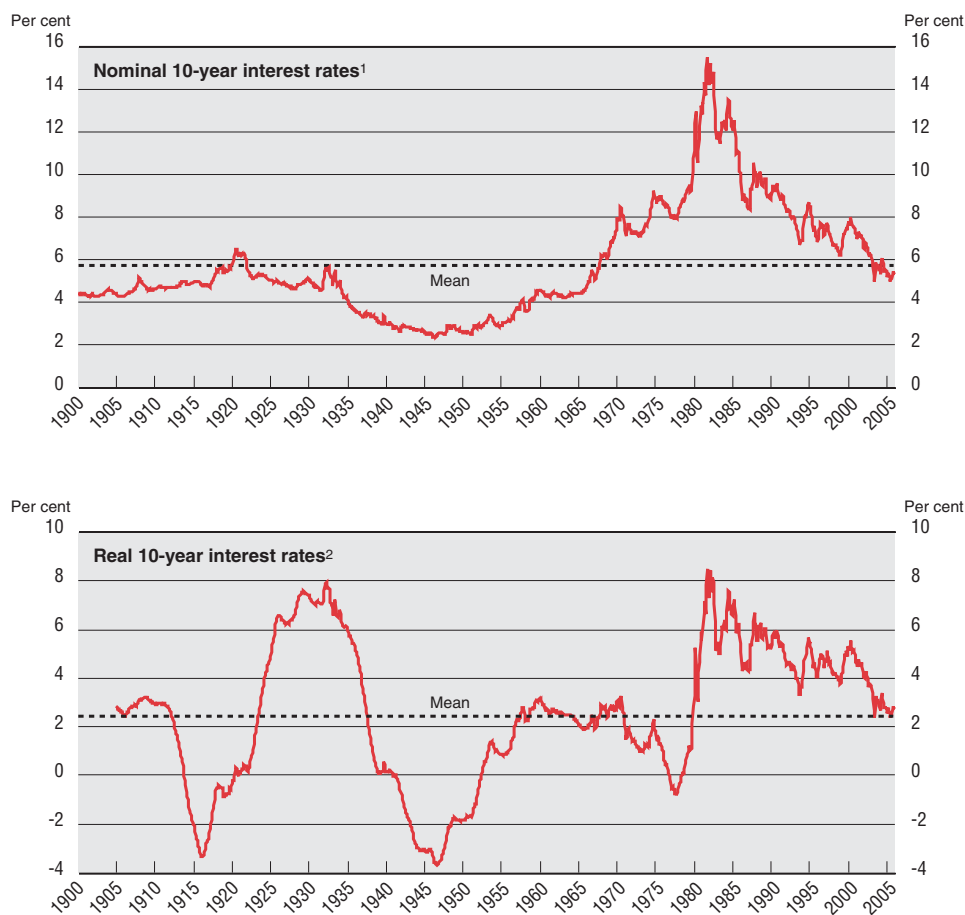
Sources: University of Michigan, Survey of Consumers and OECD.

This paper discusses some possible explanations for these three sets of “stylised facts”, partly in order to assess whether the observed trends are likely to persist or may be reversed in the near future. The explanations put forward by various commentators fall into three main groups:

Monetary policy credibility, established over an extended period, may have reduced the level of long-term rates via its impact on inflation expectations and its influence on the perceived “neutral” level of short rates consistent with stable inflation and output growth at potential. Diminished perceived inflation risks, with lower associated volatility of prices and output, may also have contributed to a flattening of the yield curve via a narrowing in term premia, as the potential for large swings in both policy rates and market prices of longer-maturity bonds diminishes.

Saving-investment shifts. Within the OECD area – and spanning the three major regions – higher corporate saving and reduced investment propensities following the pre-millennium boom may have been major offsetting factors to

Figure 4. Long-run perspective on long-term interest rates in the United States



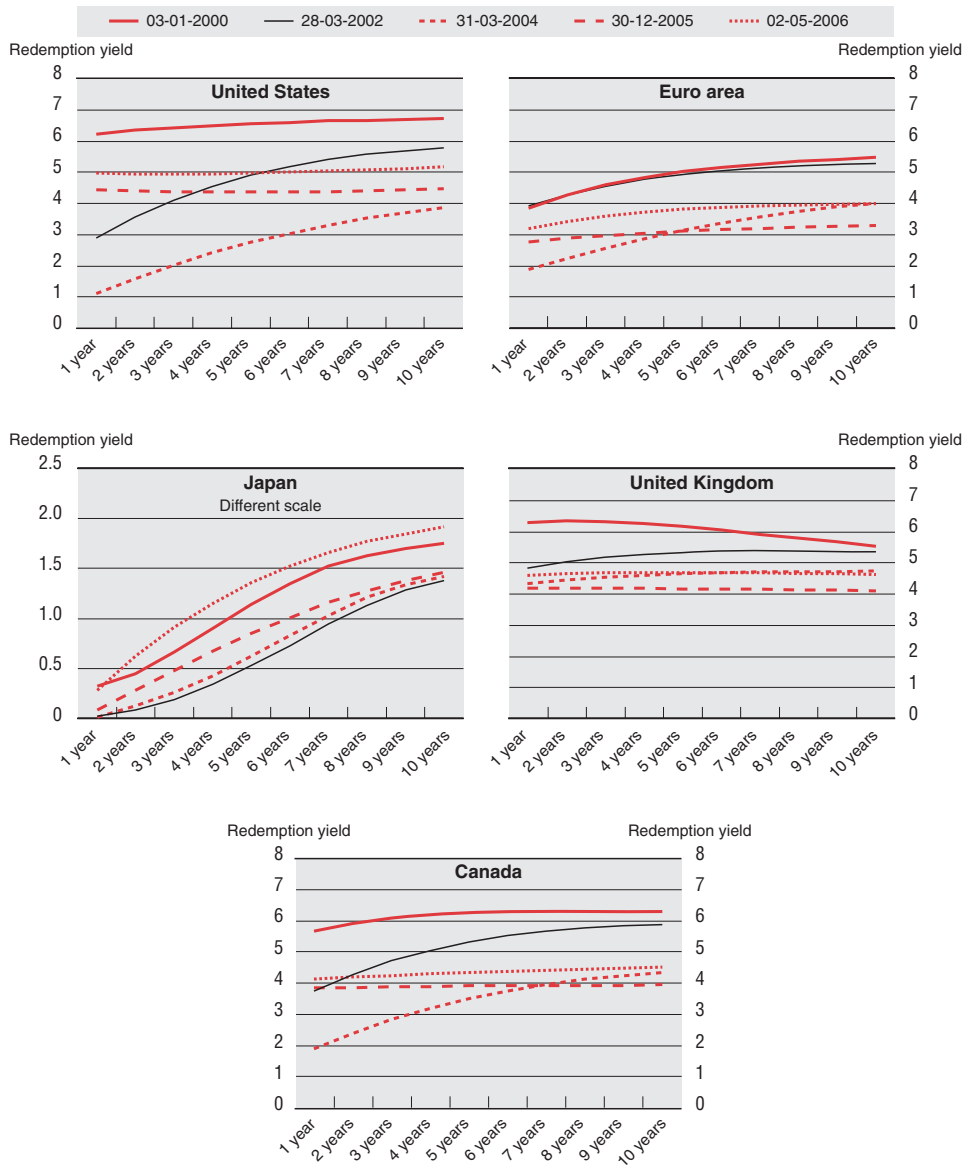
1. U.S. Index of Yields of High Grade Corporate and Municipal Bonds.

2. Nominal rates deflated by 10-year moving average of CPI inflation (5 years past and 5 years future inflation).

Sources: National Bureau of Economic Research (NBER), Bureau of Labor Statistics, Datastream.

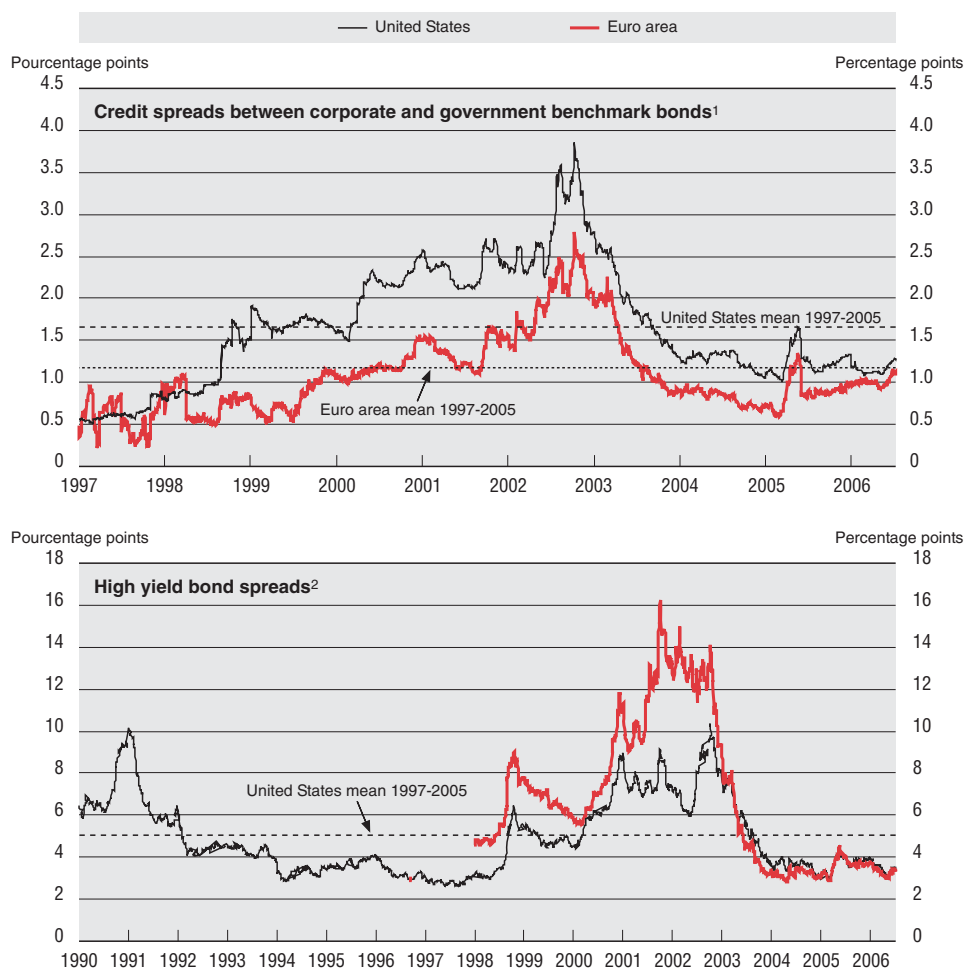
higher public sector deficits, which based on past behaviour would have been expected to push up long rates. From a global perspective, the shift towards higher *ex ante* net saving has also reflected the behaviour of developing and emerging countries, especially in Asia, since the 1998 crisis – the emphasis being variously placed on their higher saving propensities or a lack of investment.²

Figure 5. Yield curves in the major economies



Source: Datastream.

Figure 6. Corporate bond spreads



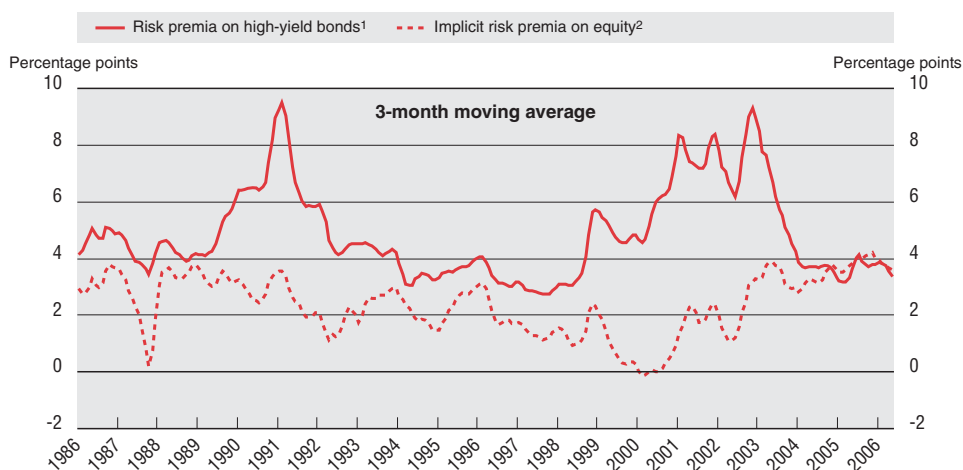
1. Spreads of high-yield bonds (Merrill Lynch indices) over government bond yields (10-year benchmark bonds).

2. Merrill Lynch corporate BBB bonds. Spreads based on average yields for 5-7 years and for 7-10 years.

Source: Datastream.

Portfolio shifts. Official portfolio flows associated with reserve accumulation among developing and emerging economies – especially in Asia (particularly China) but also more recently among oil exporters – may have created a particularly strong demand for US government bonds during the post-2002 period of rising current account imbalances in the United States. Roughly in parallel, in OECD economies more generally, a combination of changed risk

Figure 7. US high-yield bond risk premia versus implied equity risk premia



1. Spreads of US high yield bonds (Merrill Lynch indices) over government bond yields (10-year benchmark bonds).
 2. Spread of inverted US price-earning ratio over US government bond yields (10-year benchmark bonds).
- Sources: Datastream; OECD calculations.

perceptions in financial markets, triggered by the stock market crash, and concerns related to population ageing may have led to a stronger portfolio preference for bonds over equities – the need to ensure steady long-term rates of return has been driving a rebalancing of pension fund portfolios, for example. In a situation of low default rates, a focus on yield could also push up the price of inherently riskier bonds.

Based on the evidence, the paper concludes that it is unlikely that any of the individual explanations proposed above can account for all the stylised facts: the generalised decline in bond yields in recent years, the flatter yield curve and narrower spreads between riskier and riskless assets. These phenomena all have different time profiles. Also, though interest rates trends are determined within a global capital market and have some common characteristics, the puzzles are to some degree internationally differentiated, possibly involving different trends in inflation, growth, currencies and current account imbalances. For example, the situation in the United States may require the most explanation because of the massive rise in fiscal and external imbalances together with a large tightening of policy rates which, *ceteris paribus*, may have been expected to have stronger adverse effects on US long-term rates.

With these complexities in mind, the conclusions of this study are as follows:

- It corroborates that investors are probably expecting policy rates to be lower on average over the long term as compared with historical averages, which would suggest that “neutral” interest rate levels have indeed come down. At the same time, the perceived volatility of both inflation and interest rates has diminished, reflecting in part a greater confidence in the effectiveness of monetary policies to control inflation expectations, leading investors to demand lower term premia than in the past in order to hold long-term securities. These effects emerged gradually, in terms of a trend decline in long-term rates up to the turn of the century, and have been instrumental in recent years in influencing agents to expect real policy rates to remain significantly lower than past average levels despite the cyclical pick up.
- The study also concludes that a shift toward higher intended net saving at the global level is likely to have played a role in putting downward pressure on equilibrium interest rates. Its main driver has been the substantial shift toward higher net saving in newly-industrialising Asian economies and emerging markets, starting in the late 1990s. In industrialised countries higher corporate saving and more subdued investment as compared with previous cycles have been partly offset by lower household saving. Thus, increased private sector net saving has only partly compensated for the large deterioration in public sector financial balances.
- Official capital flows from Asian countries (and especially China) have been financing a large share of the US current account deficit in recent years. As these substantial and essentially price-inelastic flows have been directed primarily toward US Treasury securities, they are likely to have been one of the factors compressing term premia on that market. There is evidence that reserve accumulation in US dollars has remained large in 2005-2006, even though it may have taken forms that are not reflected in official US statistics. Increased flows from petro-dollar recycling may also have been increasingly gaining in importance with increases in oil prices since 2004.
- In addition, protracted investor aversion to equity risk in the aftermath of the stock market collapse, combined with a search for yield, have been compressing spreads on both corporate and emerging market sovereign bonds, and may also have contributed to generally low yields. Pension funds may also be shifting their asset composition toward bonds as the large baby-boom cohorts approach retirement, but there is only limited evidence so far that this has been happening in a major way in recent years, except perhaps in the United Kingdom.

Several of the above-mentioned factors – including diminished inflation risks, high Asian saving rates and to some extent also official purchases of US securities – are likely to persist for some time, suggesting that long-term rates could well remain lower than in previous decades. Moreover, other elements – such as the reallocation in pension fund assets in connection with demographic trends – may still not have displayed their full effects on market yields. Nevertheless, a reversal of some of the factors that have been keeping long rates low cannot be excluded. In particular, current market expectations about the future course of policy rates may be subject to revision as cyclical slack disappears; investor attitudes toward equity vs. bond risk could normalise if volatility increases; and perceptions regarding the long-term sustainability of China's current exchange rate policy may shift. Unfortunately, because the weight of the different explanations of the bond yield decline is not known, not only the timing but also the impact of any such events is hard to quantify.

The structure of the paper is as follows. The next section briefly outlines some analytical background. The following three sections examine in turn the three main categories of explanations presented above. The last section discusses the different elements that might either contribute to sustain low long-term interest rates or trigger a correction.

II. Decomposing the decline in long-term interest rates: forward rate expectations vs. term premia

Long-term interest rates can be decomposed into the sum of: *a*) the compounded expected short-term real interest rate during the bond's life; *b*) expected inflation, and *c*) a combination of term, liquidity and credit risk premia connected to the bonds' maturity and issuer and to the characteristics of markets where they are traded (see Box 1). The same decomposition can also in principle be applied to the corresponding sequence of forward rates, which are in many respects more interesting, since they contain information about the expected path of spot rates.³ This decomposition, which is often used in analytical models of the yield curve, provides a useful reference for examining how the different determinants of long-term rates discussed in this paper fit together.

US forward three-month interest rate curves derived from zero-coupon yields have recently become remarkably flat (Figure 8). In principle, this would be consistent with two interpretations: *either* average policy rates over the next ten years are expected to be around present levels (5 per cent) and premia are very low throughout the maturity spectrum; *or* policy rates are expected to gradually decline from present levels and this is approximately offset by term premia rising with maturity. However, the second scenario does not seem very likely. Evidence

Box 1. The determinants of long-term interest rates according to conventional models

According to financial theory, yields on long term bonds should reflect the expected future path of short rates, after correcting for term, liquidity and credit risk premia. If these premia could be assumed to be time invariant, it would be possible to attribute observed movements in market yields to changes in expected short rates, which is the basis of the “expectations hypothesis”. However, there is substantial evidence that, in practice, premia vary over time, reflecting changes in perceived underlying risks and investors’ willingness to bear them. At each future maturity, the expected short rate can be further decomposed into the expected rate of inflation and an expected real short rate, which can be seen as reflecting monetary policy stance, with associated risk premia dependent on volatility.¹ These factors may be affected by shifts in *saving/investment balances* (including budget deficits) which may affect the level and the slope of the yield curve, and by *shifts in portfolio preferences*, which may affect the curvature of the yield curve via their impact on term premia.

Monetary policy expectations can influence the yield curve via the expected path of real policy rates (which responds to the evolution of aggregate demand and inflation) and will be reflected in the short and medium term portion of the forward curve. If, however, policy rates are expected to return to the neutral level once any cyclical and inflation shocks have run their course and if long term inflation expectations are well anchored, the far end of the forward curve should in principle move very little over the course of the cycle as long as term and other premia do not vary. If in practice far out forward rates do shift around, this may reflect changes in long term inflation expectations, in the expected real neutral rate or in far out term premia. Of these, the real neutral rate should in principle be essentially determined by the longer run real equilibrium of the economy, while inflation expectations may vary with perceptions of either the central bank’s inflation target or its ability to achieve it change over time. Monetary policy credibility may also affect term premia, to the extent that the expected variability of both inflation and real interest rates affect the degree of uncertainty on asset returns.

The *balance between saving and investment* enters as a fundamental driver of changes in equilibrium real interest rates in most theoretical models. Its underlying determinants include shocks to the marginal productivity of capital, rates of time preference and expected income profiles (including the effect of future taxes), as well as demographic factors related to ageing. Depending on the degree of international capital mobility, the equilibrium real rate will be determined either at the global or at the national level. The empirical literature suggests that although capital mobility has been increasing it is probably not perfect. In this case, shifts in national saving and investment – reflecting changes in private and/or public sector behaviour – can affect real interest differentials.² In the limiting case of fully integrated capital markets a global real interest rate is determined by global saving and investment, although some scope for cross country differentials would still exist if real exchange rates are expected to change over time.

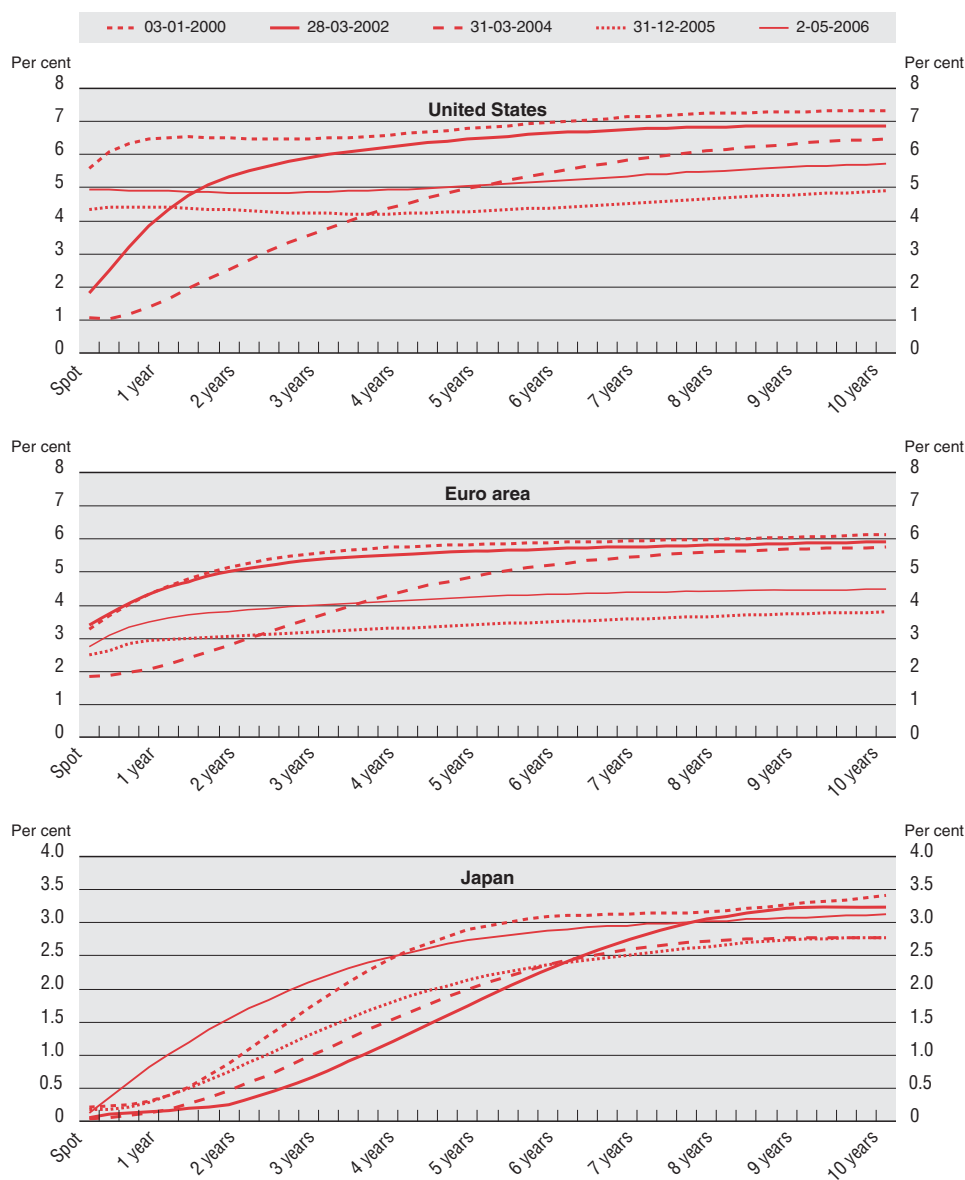
Box 1. The determinants of long-term interest rates according to conventional models (cont.)

Shifts in investors' portfolio preferences as between different asset categories can affect bond yields via changes in the size of term and other risk premia. Such aggregate shifts may result from changes in investors' perceptions of and/or attitudes toward risk, or they may be the effect of shifts in the distribution of wealth across categories of agents with different risk preferences. For example, an increase in the demand for long term government bonds relative to the existing supply – or a shift in the composition of demand toward investors less sensitive to risk – will normally tend to compress premia. Yields may therefore decline even in the absence of changes in expected inflation and equilibrium real rates, and the yield curve will flatten if the decline in term premia is larger at longer maturities.

1. As in the determination of other asset prices, the relevant expectations and risk perceptions are those of the marginal investor, not the average ones present in the market. Since exogenous shifts in bond demand or supply – such as, for example, large transactions by official authorities – can move the position of the marginal investor, they may affect market prices even though expectations and risk perceptions have not changed. To the extent that the empirical decomposition of bond yields is based on indicators of average rather than marginal expectations (as in the case of surveys), the effects of such demand or supply shifts will tend to be attributed to changes in term premia, which are calculated as a residual. For a discussion of these issues, see Mishkin (1981) and Kim and Orphanides (2005).
2. Fiscal imbalances, as reflected in large budget deficits and/or a high public debt, may also affect interest rates via higher term or default premia on public debt. Higher term premia may for example result if an unsustainable fiscal situation increases inflation expectations and policy uncertainty.

from surveys (Figure 9) and market analysts' commentaries suggest that policy rates are expected to remain not far below current levels. Moreover, there are no signs that US financial markets have started to anticipate a recession – a situation that is usually associated with a flattening and eventually an inversion of the yield curve. For example, based on Consensus forecasts in early 2006, US output growth was expected to continue at close to potential rates.

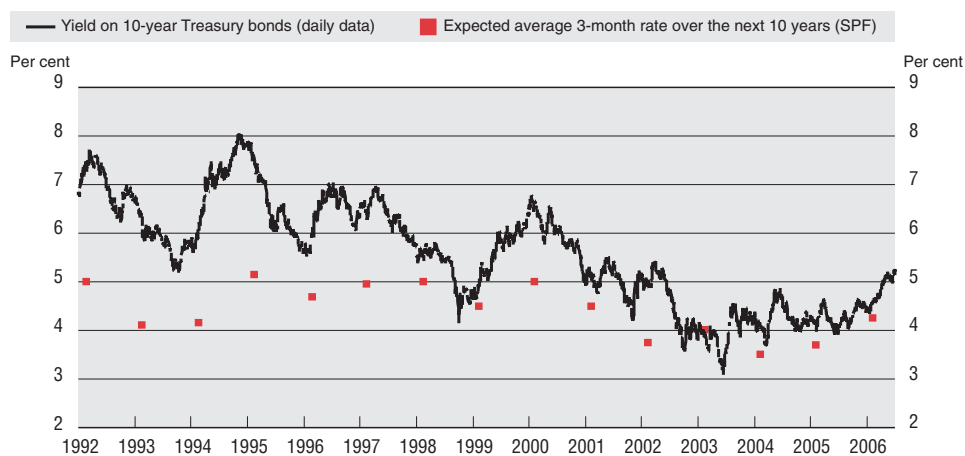
Evidence is less clear-cut for the euro area and Japan, but on balance, it is likely that term premia have also declined substantially, although perhaps by less than in the United States. The forward interest rate curve has not become as flat as in the United States, not only at the front end – which largely reflects the fact that these two economies are only at the start of their respective monetary tightening cycles – but also in the 5 to 10 year section (Figures 8 and 10). But current long rates, at around 4 per cent in the euro area and below 2 per cent in Japan, could

Figure 8. Forward 3-month interest rate curves¹

1. Interpolated forward 3-month interest rates derived from zero-coupon yield curves.

Sources: US Federal Reserve Board, Bundesbank and Datastream.

Figure 9. United States: bond yields and expected average short-term rate



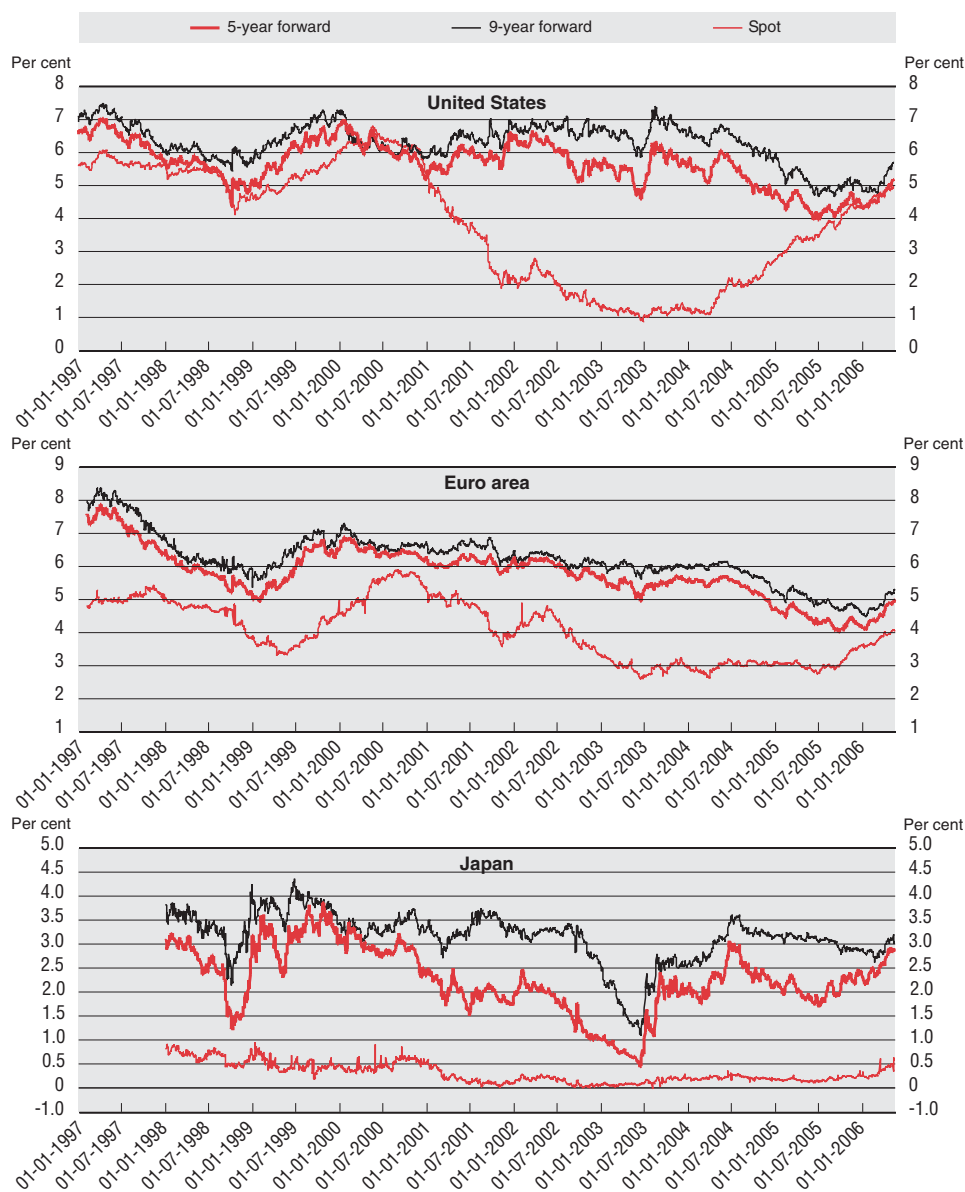
Sources: Datastream; Federal Reserve Bank of Philadelphia, Survey of Professional Forecasters.

be reconciled with term premia at their historic average levels of 1-1½ per cent only if average short rates over the next ten years were expected to be close to or only slightly above current levels, which seems an unrealistic assumption given the current level of monetary accommodation.

Recent econometric research at the Federal Reserve seems to confirm the conclusion that US term premia have fallen. Modern term structure theory states that the information value of the forward curve for forecasting future short rates depends on the correct “loading” of level, slope and curvature factors.⁴ Applying this three-factor model to extract the information content of the ten-year instantaneous forward rate, and incorporating *Blue Chip* survey data on expected short rates and similar professional forecasters data on inflation expectations, the Fed finding is that term premia have shown a clear declining trend since the early 1990s, while oscillating considerably over time.⁵ They have come down particularly sharply since mid-2004. Lower expected short-term rates and term premia both contributed to the decline in 10-year forward rates in the United States from 1990, but the most recent decline – between June 2004 and July 2005 – has essentially been due to a fall in the term premium alone.

In Figure 11 the same three-factor model is applied to the 9-year ahead one-year forward rate.⁶ While, based on historical averages, the “normal” term premia for most industrialised countries would tend to be of the order of 1 to 1½ percentage points for 10-year yields, with differences across countries related mainly to the size of budget deficits, based on these estimates, the term premium on 10-year yields

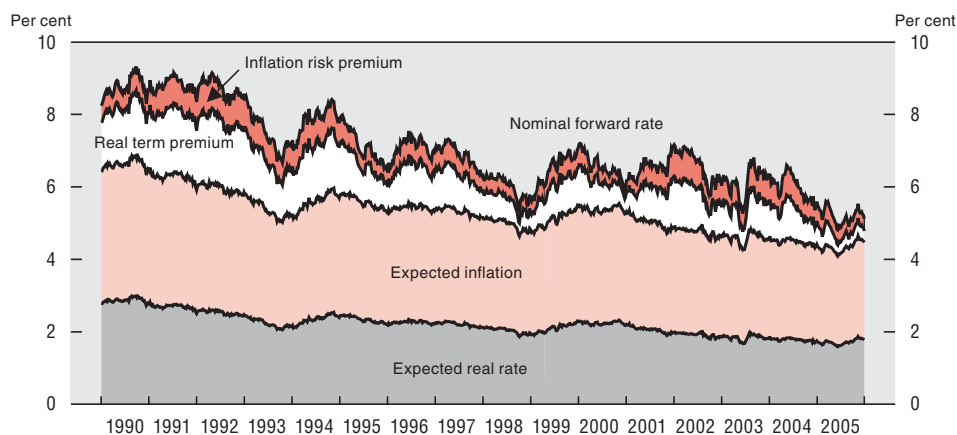
Figure 10. Spot and implied forward 1-year interest rates



1. Forward interest rates at different horizons are derived from zero-coupon yield curves.

Sources: US Federal Reserve Board, Bundesbank and Datastream.

Figure 11. **Decomposition of one-year forward rate/ nine years ahead using a three-factor no-arbitrage model**



Source: Federal Reserve Board, based on methodology of Kim and Wright (2005).

had fallen to less than $\frac{1}{2}$ of a percentage point at the end of 2005.⁷ Again, it is evident that the fall in long-horizon forward rates has been due, over an extended period, to a trend decline in both expected short-term interest rates and lower term premia,⁸ but their further decline since 2000 can be attributed only to a limited extent to lower expected short rates. It is mainly – and particularly since mid-2004 in the United States – due to a substantial decline in term premia.

III. The role of monetary policy factors

Before analysing the factors behind the more recent decline in term premia in more depth, it is worth exploring the fundamental factors behind the longer-run downward trend in expected short rates and premia. While the concept of “*neutral*” or *equilibrium real interest rate* involves a substantial amount of judgment, it may prove to be a convenient starting point for understanding this trend, together with declining inflation expectations and associated volatility.

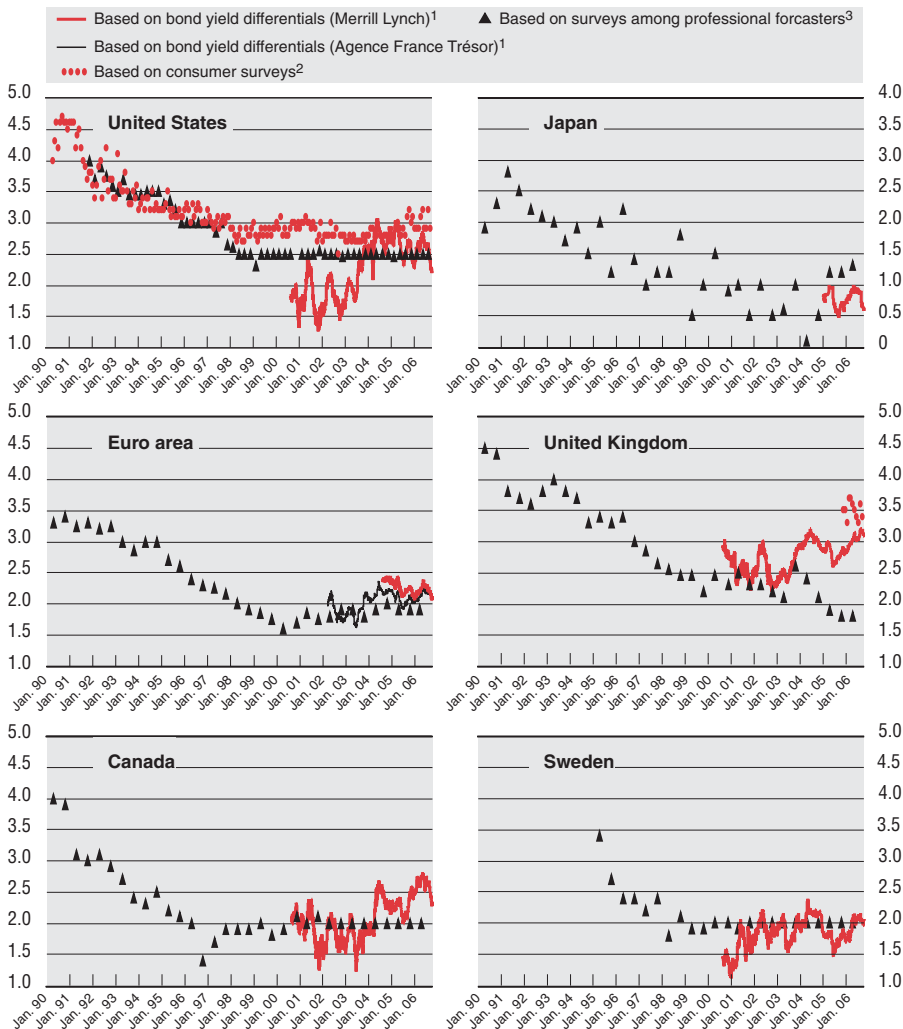
Analysis conducted both at the Federal Reserve and the OECD suggests that in the US case the neutral real federal funds rate – the rate consistent with output growth at potential and stable inflation – has trended down to just above 2 per cent, after having fluctuated between 2 and 5 per cent since the 1960s.⁹ Euro-area studies suggest that since the mid-1990s, the neutral repo rate has also come down, to around 1½-2 per cent in real terms. Though considerable uncertainty attaches to estimates of neutral rate levels, the evidence suggests a gradual downward shift throughout the 1990s, which may have continued in recent years.

Increased monetary policy credibility, evident OECD-wide in low and well-anchored inflation expectations, has probably contributed to reducing the expected average level of policy rates¹⁰ as well as to compressing term premia. The evidence from surveys among professional forecasters suggests that long-term expected inflation declined gradually throughout the 1990s, but has moved little since 2000, at least in the United States and the euro area – a different time pattern is found in Japan (Figure 12). Inflation expectations as implied by yield differentials between nominal and index-linked bonds, on the other hand, would seem to show a rise between 2000 and 2004 in both the United States and the euro area. However, these indicators are notoriously volatile and may be distorted by specific market conditions. In particular, as markets for long-term index-linked bonds are not very deep, differentials may have been affected by a large increase in the demand for those assets by institutional investors in recent years (see Section 5 below).

Together with expected inflation, long-term inflation uncertainty also seems to have declined over the last decade-and-a-half (Figure 13, left panel),¹¹ and with it presumably market perceptions of the need for large oscillations of policy rates. Some proxies for interest rate uncertainty, such as the dispersion of individual forecasts in surveys among professional forecasters, do in fact show a decline in the 1990s and then again since 2004, after a temporary increase after 2000 (Figure 13, right panel). As the (perceived) potential for large swings in market prices of long-term bonds has diminished, so probably have the actual and perceived risk of holding them, and hence inflation risk premia (Figure 11). Taking the recent period of rising oil prices, the effect of increased confidence in monetary authorities is most evident in the steadiness of long-term inflation expectations to adverse short-term inflation developments. However, confidence effects are likely to have been felt gradually, and are unlikely to have been a major driving factor in the most recent decline in term premia since the beginning of the tightening-cycle in mid-2004.¹²

Rather, there has been a lack of fundamental surprises which could have affected medium-term investor behaviour. A remarkable feature of the recent behaviour of US bond markets has been the muted reaction to the start of policy tightening since mid-2004, in sharp contrast with what happened in 1994. The more effective use by monetary authorities of communication policies to shape public expectations about the future course of interest rates and to influence bond-market responses could have been a factor here, especially the use of explicit announcements regarding the future path of policy rates.¹³ A protracted period of low policy interest rates and an effort to guide market expectations through the process of returning the stance to neutral seems not only to have helped reduce uncertainty on future policies, but may also have had a durable effect on market perceptions of what is to be regarded as the “normal” policy stance.

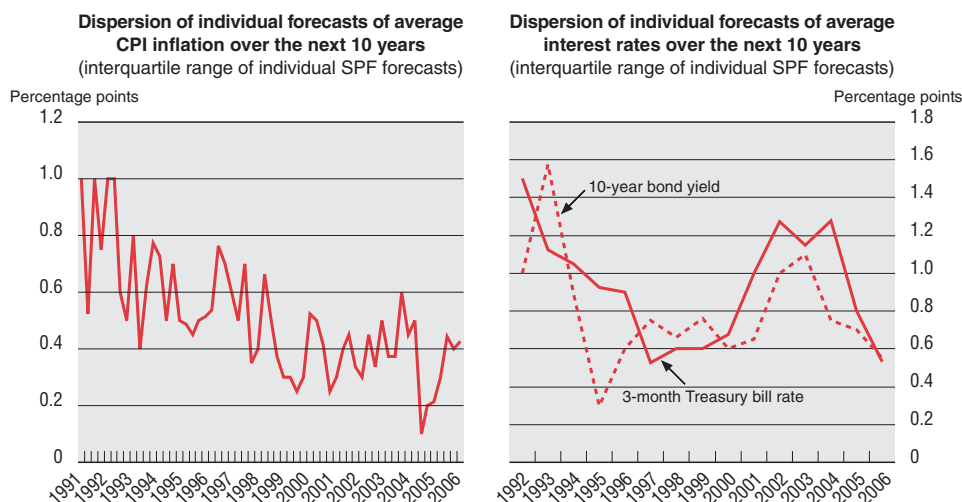
Figure 12. Proxies for long-term expected inflation



1. Expected inflation implied by the yield differential between government benchmark bonds and inflation-indexed bonds. Government bond yields are for 10-year benchmark bonds.
2. Expected CPI inflation 5 to 10 years ahead (median forecast). Based on the University of Michigan Survey of Consumers for the United States, on the Citigroup/YouGov survey for the United Kingdom.
3. Expected average rate of CPI inflation over the next 10 years for the United States, based on the Survey of Professional Forecasters (SPF) by the Federal Reserve Bank of Philadelphia. Expected HICP inflation rate 5 year ahead for the euro area, based on the SPF by the ECB.

Sources: Datastream, Agence France Trésor, University of Michigan Survey of Consumers, Citigroup, Consensus Forecasts, Federal Reserve Bank of Philadelphia, ECB.

Figure 13. **United States: measures of uncertainty on long-term average inflation and interest rate levels**



Source: Federal Reserve Bank of Philadelphia Survey of Professional Forecasters.

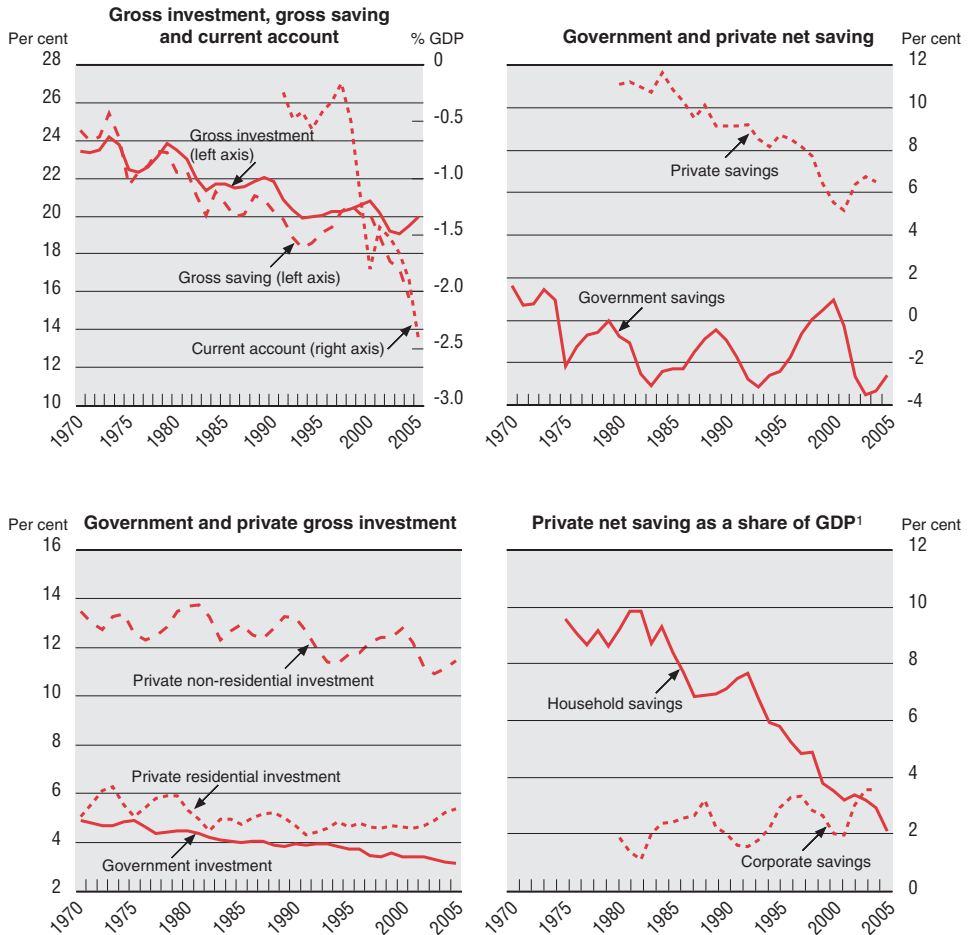
IV. Global saving-investment behaviour

Long-term rates may also be looked at from the viewpoint of imbalances between intended saving and investment. It has been argued that, notwithstanding sharp increases in public-sector dissaving, global saving and investment propensities have shifted toward *ex ante* global surplus saving, translating into a world-wide reduction in long-term yields. “Intended” saving and investment are hard to quantify, however, since observed magnitudes are the product of income and interest-rate changes as well as discretionary decisions. With that in mind, this section first looks at sectoral saving and investment behaviour in the major OECD economies and then at the evidence for a so-called “global saving glut” arising because of saving behaviour in Asian economies since the crisis of 1997, and more recently, in oil-producing economies.

*Shifts in the saving-investment balance in industrialised countries*¹⁴

Saving and investment developments in industrialised countries do not seem to provide an explanation for low bond yields. On the saving side, a sizeable upward shift in corporate net saving as a share of gross operating surplus and GDP has been partly offset by lower household saving, with exceptions among the euro-area economies (Figures 14). But the net increase in private sector saving has

Figure 14. **Saving and investment in the G7 economies**
In per cent of GDP



1. Net saving is defined as gross saving less fixed capital formation (depreciation).
Source: OECD.

been swamped by the deterioration of public sector financial balance, especially in the United States, but also in Japan, the euro area and the United Kingdom. Overall, gross saving in the G7 countries declined from levels well above 20 per cent of GDP in the 1970s and 1980s to record lows of around 16 per cent of GDP in 2004. On the investment side, a lower business fixed investment ratio¹⁵ has been offset only in part by buoyant residential investment. Thus, in *ex post* terms, the private sector offset to the deterioration in government saving has been significant but limited. At best, private sector saving-investment shifts – if they were

expected to persist – could partly explain why the large deterioration in government accounts, particularly in the United States, has not had the expected upward effect on bond rates.

Shifts in private saving and investment have been driven in part by cyclical factors, which can be expected to be reversed in coming years, but have also reflected some longer-term trends. Housing market booms in several countries have contributed to depressing household saving and to boosting housing investment. The increase in corporate saving has been driven in large part by rising corporate profitability, which is partly cyclical but has also reflected the trend decline in the wage share connected to competition from labour-intensive emerging economies. As for low corporate fixed investment, its sluggish recovery in the current upswing has been attributed in part to the overhang from earlier over-investment in the United States and perhaps to the too timid implementation of structural reforms in the euro area and Japan; however, investment ratios in industrialised countries have been on a declining trend since the 1980s, mainly as a result of the trend decline in the relative price of investment goods.¹⁶

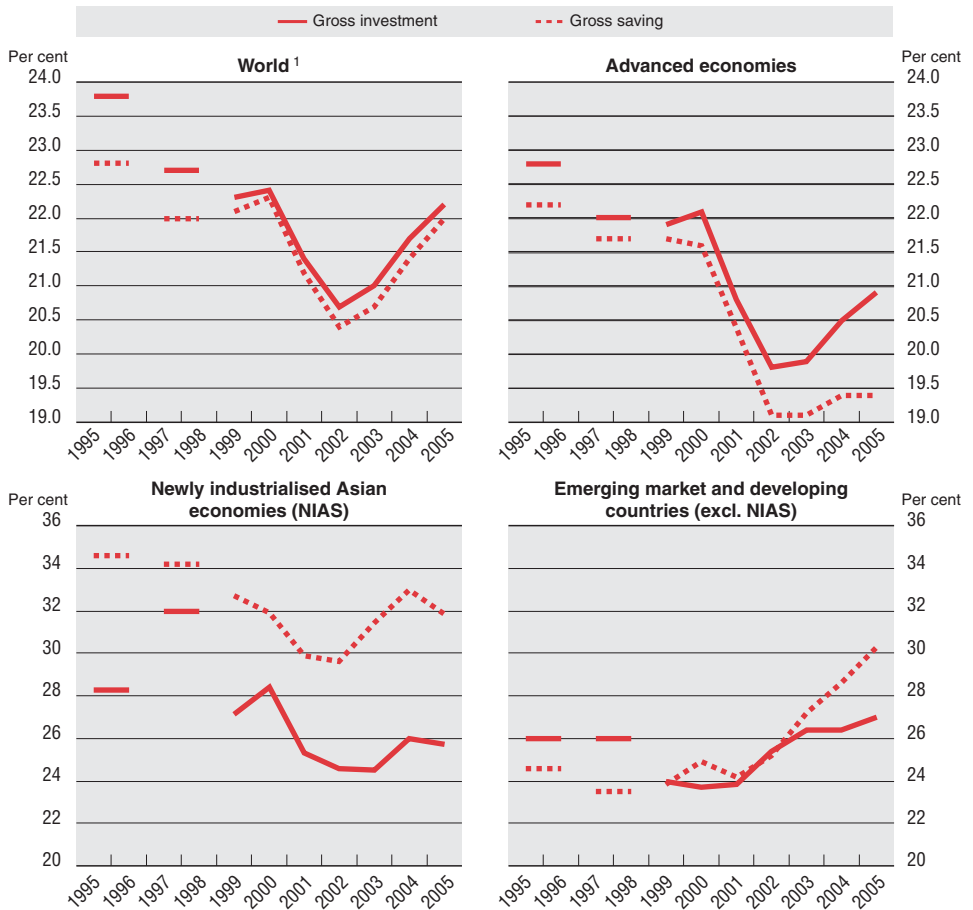
A structural shift in the world's saving-investment balance: the role of Asia and oil-exporters

Some observers have emphasised the role of excess saving in emerging market and developing countries as a force behind low interest rates.¹⁷ Mirroring developments in industrialised economies emerging market and developing countries have, in aggregate, seen a very strong increase in saving, displayed by widening current account surpluses. Two-thirds of the increase in the US current account deficit since 1997 (the last time that it was below 3 per cent of GDP) has been counterbalanced by higher external surpluses in emerging Asia (mainly China) and, more recently, in oil-exporting economies. In aggregate, developing countries have turned from borrowers on international capital markets to large net lenders (Figure 15, lower-right panel).

There is some evidence to suggest that the emerging-market saving shift has been more than just a passive response to developments in the industrialised world. Following the 1997 financial crisis many East Asian countries increased their saving and reduced capital spending to below historical norms. A noteworthy feature is the strong increase in the Chinese surplus which, in a situation of structurally high saving in the household and business sectors, was in recent years mainly driven by increased public sector saving. As a result, the total saving-to-GDP ratio has increased from a stable 40 per cent up to 2000 to 50 per cent in 2004.¹⁸

The timing of the regional shift in global savings is reasonably consistent with the decline in global interest rates since both the rise in emerging-market saving and the decline in industrialised countries' investment have been occurring progres-

Figure 15. **Gross investment and saving – a global perspective**
In per cent of GDP



1. By definition, world investment equals world savings. The difference shown here represents statistical errors (also often referred to as the World Current Account Deficit).
Source: IMF, World Economic Outlook.

sively over past years; proxied by capital flows, the saving shift appears as a significant determinant of bond yields in regression analysis.¹⁹ Moreover, there has been an acceleration in emerging market saving since 2004, as reflected in increasing current account surpluses both in China and oil exporting economies. However, shifts in the global saving-investment balance *by themselves* are unlikely to provide a full explanation either of why the yield curve has flattened or why bond yields are particularly low in the United States.

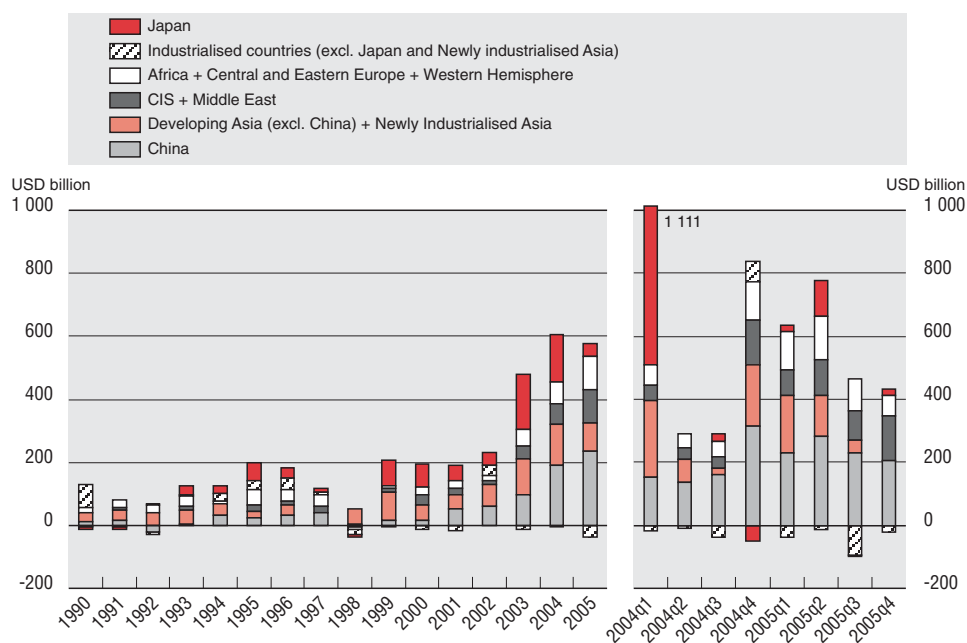
V. Portfolio considerations

In addition to factors related to monetary policy or saving and investment, long-term real yields are also likely to have been influenced by portfolio shifts across financial instruments and countries. A number of factors may be involved here: official accumulation of foreign reserves among mainly Asian economies seeking to stabilise their currencies, recycling of increased oil revenues, changes in portfolio preferences due to ageing, especially on the part of pension funds, and a switch from equities to bonds due to the experience of the stock-market downturn.

Official reserve accumulation and petrodollars

A large portion of the assets accumulated through current account surpluses in emerging Asia, notably in China, and also in Japan²⁰ have accrued in the form of foreign exchange reserves (Figure 16). Global reserve accumulation in 2004 and

Figure 16. **Estimated reserve accumulation (excluding gold) by region**



1. Estimated year-on-year changes in reserves for yearly data. Estimated annualised quarter-on-quarter changes for quarterly data.
2. Data on reported changes in reserve levels have been adjusted in an attempt to correct for valuation effects due to USD-Euro currency fluctuations.

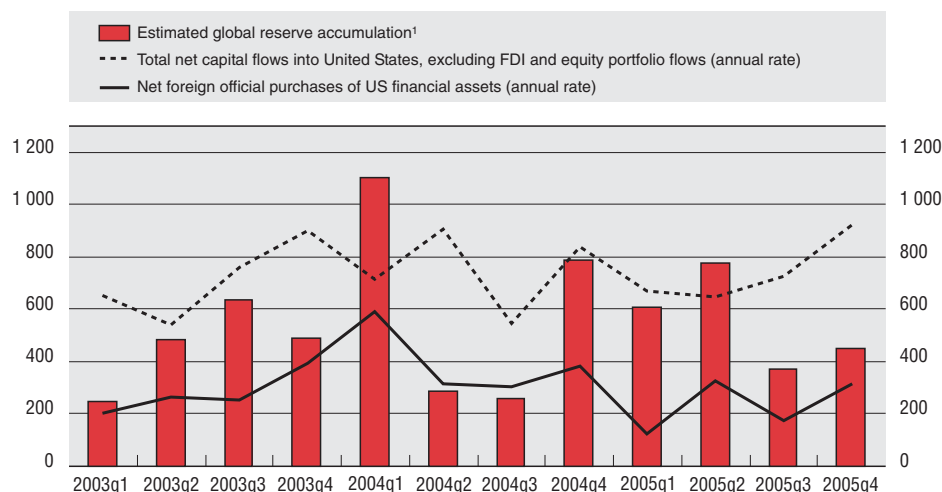
Sources: International Monetary Fund and OECD calculations.

2005 was roughly three times the 1999-2001 average. Asia has accounted for roughly three-quarters of global reserve accumulation, with the share of China growing steadily.²¹ The motivation for maintaining large official dollar assets is somewhat different across economies, but for most developing and emerging economies it is the authorities' concern about the potential negative implications of exchange rate appreciation for economic activity and the long-term external balance, with the ensuing need for absorbing the foreign currency inflows by accumulating reserves. From this it has been argued that Asia can now be seen as part of an expanded dollar bloc that is willing to provide the external funding the United States requires.²² The implications are that, insofar as Asian central banks peg their exchange rates to the dollar, their demand for US bonds will be inelastic to interest rates. Moreover, official capital flows into US bonds tend to encourage private inflows, as private investors see Asian central banks as ensuring the continuation of low long-term US rates and a relatively strong US dollar.

The argument has the virtue of being consistent with the stylised facts, while helping to explain the relatively marked downward effect on US bond rates and the flattening term structure. The timing of the recent fall in US term premia, starting in 2004 and deepening in 2005, seems to match that of the increase in both reserve accumulation and petrodollar recycling. The impact of reserve accumulation on current US interest rates has been quantified by different econometric studies in a range from 40 to 100 basis points.²³ The importance of official flows may actually be even higher than these econometric estimates suggest, as reserves held offshore through intermediaries are not recorded in US statistics as official purchases.²⁴ Given this limitation, it is also questionable whether official dollar purchases really became less important in 2005, as the official US balance of payments data would indicate (Figure 17). According to IMF data, global reserves continued to increase very strongly in 2005. Although their currency composition is not known well and the ratio of global reserves held as dollars can fluctuate from year to year, BIS estimations and IMF data indicate the historically normal ratio to be around two-thirds. If that ratio were to have held in 2005, the continued reserve accumulation in US dollar assets would have continued to be substantial (Box 2). This would not be inconsistent with US balance of payments data, if the proportion of dollar reserves held outside US institutions or security depositories has increased.²⁵

As a result of the surge in the oil price, more recently there has also been a massive transfer of revenues towards oil exporting countries which, to the degree it is being recycled through financial markets, would add to official capital flows. So far, increasing current account surpluses in oil-exporting countries have only shown up to a very limited extent in foreign exchange reserves (in spite of the fact that a number of them have fixed or managed exchange rates that are heavily oriented towards the US dollar).²⁶ However, a significant share of oil producers' cur-

Figure 17. **Estimated global reserve accumulation versus net foreign official purchases of US financial assets**



1. Estimated annualised quarter-on-quarter changes. Data on reported changes in reserve levels have been adjusted in an attempt to correct for revaluation effects due to USD-Euro currency fluctuations.

Sources: US Bureau of Economic Analysis, International Monetary Fund and OECD calculations.

rent account surpluses has been accumulated by and invested through other official institutions (stabilisation funds, official investment funds, etc.) As investments by both private agents and state investment funds of oil exporting countries are more likely to be yield-oriented, the share of these investments going into US bonds is probably smaller than the corresponding share in central bank reserves; nonetheless, a substantial proportion would have gone into dollar-denominated assets, including US bonds.²⁷ Box 2 gives some speculative estimates of this.

Pension fund portfolios and shifts between asset classes

Current low levels of long-term interest rates may also partly reflect shifts in portfolio composition connected to demographic trends. Aggregate household saving depends to some degree on the age structure of the population, and will fluctuate with changes in the share of prime savers (people aged between 40 and 59) and of “potential dissavers” (people above 60). At least until 2010 these shifts should be broadly supportive for household saving in the G7 zone. In addition there may be a shift in preferences towards bonds as risk management considerations would induce individuals to shift their portfolios gradually to less risky assets with age. Any such shift is likely to be mediated to a large degree through

Box 2. The Bretton Woods II debate, central bank reserve accumulation, and oil revenue recycling

There is currently a debate as to whether the global situation resembles a “Bretton Woods II” system. The “Bretton Woods II” hypothesis argues that a number of developing and emerging market countries, especially in emerging Asia (particularly China), have adopted a strategy of *de facto* pegging their exchange rates to the dollar. Given strong consumption growth in the United States, the result has been sizeable current account surpluses in Asian countries, and an increasing US current account deficit, largely financed by official flows from Asian central banks (mainly China). The comparison of the current situation with the Bretton Woods system has been criticised on a number of grounds, but mainly with respect to its potential durability.³ However, both the emerging Asian economies – especially China – and the US could have an interest in its continuation. For China it is a means of providing strong growth in industrial employment, which Chinese policymakers appear to see as crucial for political stability. To the degree that strong export growth necessitates (or is perceived to necessitate) a very competitive exchange rate, Chinese authorities seem to be prepared to buy up whatever amount of foreign currency they deem necessary.

Making a rough adjustment of reported changes in the stock of reserves for currency fluctuations, central banks world-wide are estimated to have accumulated reserves worth in the order of USD 550-600 billion in 2004 and 2005, of which around USD 400 billion by developing and emerging market countries (including Middle East and CIS oil exporters). Asian countries, as well as developing countries and oil exporters accounted for the overwhelming share of this (see Figure 16).

Estimating the share of US dollar assets in total reserve accumulation requires some assumptions, since the composition of global reserves is not known. Given estimated reserve accumulation for 2005 and assuming that two-thirds of central bank reserve accumulation has gone into US bonds – in line with the historical share as estimated by the BIS – central banks (excluding those of oil exporters) would have invested somewhat below USD 400 billion in US bonds (of which around USD 300 billion from Asia). If oil exporting countries as a whole (including entities other than central banks) are assumed to invest in US bonds about a third of their current account surpluses (which may be on the high side), that would amount to approximately USD 120 billion in 2005, in which case the recycling of oil revenues would be playing a growing role, but would remain nonetheless a less important driver than central bank reserve accumulation. Such calculations can only be taken as illustrative, however, as neither the currency composition of central banks’ reserve accumulation nor the final destination of financial investment flows from oil exporters is well understood.

The main issue looking forward is for how long the massive reserve accumulation observed in recent years will continue. In the case of oil exporters, barring further increases in oil prices their net asset accumulation is likely to slow down rapidly as oil revenues are gradually re-spent, in line with previously observed.

Box 2. The Bretton Woods II debate, central bank reserve accumulation, and oil revenue recycling (cont.)

behaviour. On the other hand, it is more difficult to predict how reserve accumulation by Asian central banks will evolve. At the root of the question of whether China will continue to accumulate reserves lies the question of how long it will continue to consider it in its own interest to maintain a largely fixed exchange rate against the dollar. Interest groups supporting continuation of export-led growth and opposing currency appreciation remain powerful. However, such a policy does not necessarily need to be associated with an *expanding* current account surplus, as outside the general government sector the growth of domestic investment has largely matched the growth of savings. The increase in the current account surplus in 2005 may have been a temporary phenomenon due to the use of administrative investment controls, and could stabilise as those restrictions are eased. In the short and medium term the current account deficit is expected to stay at current levels, and pressures for a rebalancing may emerge in the longer term. At the same time, as long as China is perceived to be economically successful it is likely to continue to receive capital inflows, or at least is unlikely to experience massive outflows. Authorities will therefore need to keep accumulating reserves if they want to prevent the exchange rate from appreciating, even though this may involve increasing strains on domestic monetary policy, with low domestic interest rates contributing to resource misallocation and making it more difficult to control inflationary pressures.

1. See Roubini and Setser (2005), Eichengreen (2004) and Goldstein and Lardy (2005). The "Bretton Woods II" hypothesis has also been widely criticised in Asia as reflecting an Atlantic-biased view of the global financial system. Recent efforts by Asian governments (including central banks and treasuries) to develop area-wide bond markets, as exemplified by the successful launch of Panda bonds, would all indicate their unwillingness to be incorporated as part of a dollar bloc.
2. Japan's reserves rose by roughly USD135 billion (almost entirely in the first quarter of 2004). Non-OECD Asia accounted for roughly two-thirds of the reserve accumulation of developing and emerging countries, with China accounting for roughly two-thirds of the non-OECD Asian accumulation.
3. The overall surplus of oil exporting countries was over USD350 billion in 2005 (estimated based on IMF projections; IMF, 2005).
4. See OECD *Economic Outlook* No. 78, December 2005.

pension funds. Pension funds have always been important buyers of high-quality fixed-income securities, but their demand for long-term bonds may have further strengthened in recent years as a result of the 2000-01 experience²⁸ and recent regulatory and accounting changes which forced them to adopt a much sharper focus on the management of the interest rate risk that they face on the liability side of their balance sheets.²⁹ However, there may not be sufficient quantities of suit-

able instruments available for pension fund investments to fit the retirement pattern arising from the projected increase in retirees in almost all G-7 countries after 2010.

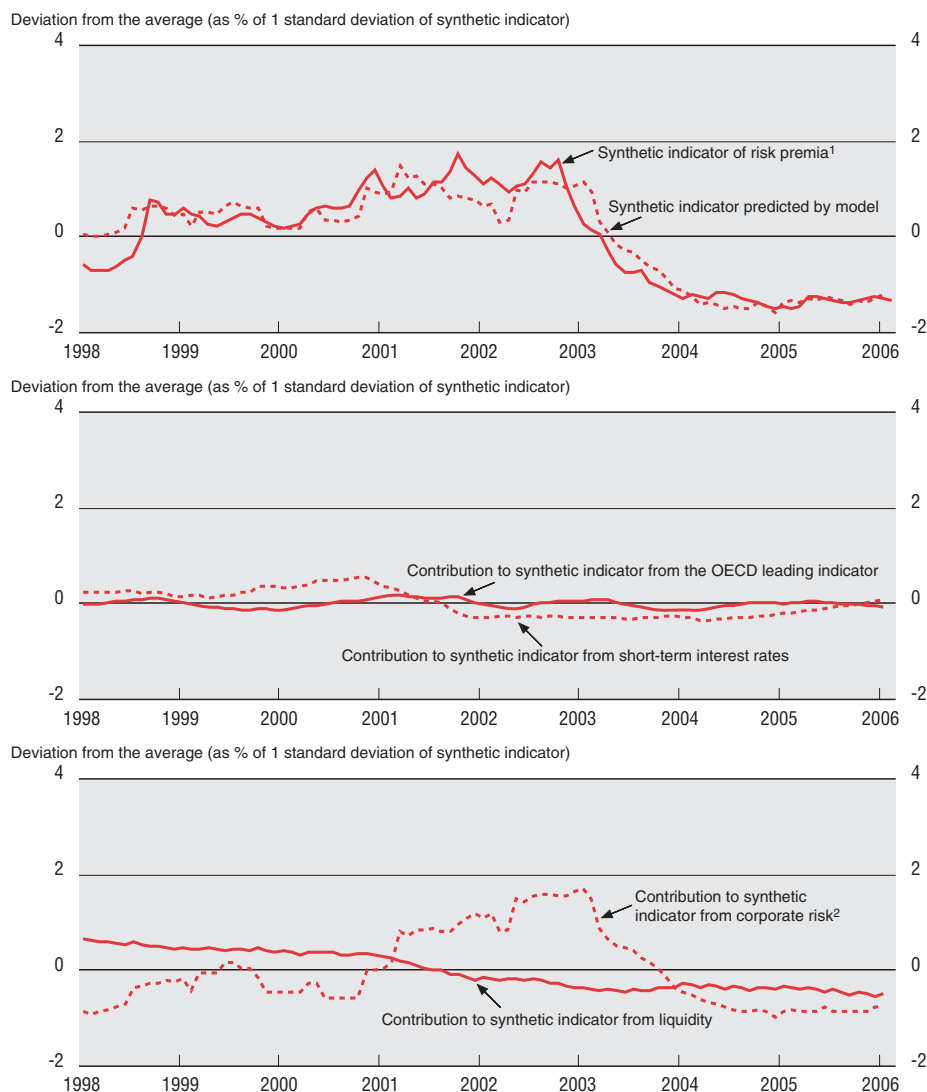
Indeed, the asset value of (autonomous) pension funds in the G-10 countries is much larger than the amount of outstanding long-term government bonds, a feature that is especially prevalent in the United States, the United Kingdom, Canada and Switzerland. While the excess demand is not apparent for G-10 pension funds in aggregate at the maturity range of up to 10 years, in the United States and the United Kingdom, cash-flow matching attempts by all of the countries' pension funds would be unsuccessful over both short and longer-run horizons.³⁰ The extent to which authorities have facilitated the development of longer-dated bond markets has differed, but the average duration of all G-10 government debt has been roughly stable since 2004 (and there has been a marked fall in the US from almost six years in 2001 to below four in 2005).³¹

However, much of the evidence here is still partial and anecdotal. The shift to bonds appears to be most marked where equity allocations of pension funds had previously been relatively high.³² The available flow-of-funds data show such a shift in the United Kingdom³³ starting in the late 1990s but not, at least so far, in the United States.³⁴ However, those data may not fully capture the portfolio shifts liable to have had an impact on market prices, for several reasons. First, there may have been a switch to longer maturities within bond portfolios. And secondly, it appears that pension funds have been making an increasing use of derivative instruments to align the composition of their asset portfolios with their liabilities.³⁵

On the other hand, low yields on government bonds do not seem to be the result of a generalised "flight to quality". Figure 18 shows that the OECD's synthetic indicator for risk premia on higher-risk bonds is currently quite well explained by fundamentals. These include such factors as ample liquidity and low expected corporate default rates, the latter as proxied by actual default rates or projected defaults on the part of rating agencies (see Box 3). In aggregate there would seem to be no marked misalignment in the riskier bond segment, provided that current perceptions of default risks are realistic – which cannot be taken for granted. The relatively high aversion towards equity risk as compared with bonds may not yet have returned to normal, but – if anything – investors' willingness to hold equities rose throughout 2005, which would not help explain why "cyclically adjusted" yields on bonds were falling at the same time.

Summing up, portfolio reallocations associated with a new distribution of world savings seem to be an important element for understanding why bond yields have been generally low in recent years, and are probably the single most important reason why – in "cyclically adjusted terms" – they fell further between mid-2004 and end-2005. As far as US yields are concerned, the official reserve story fits rather well with atypically low long rates (via declining term premia), pro-

Figure 18. Actual and predicted synthetic indicator of risk premia



1. The synthetic indicator is calculated as the first principal component accounting for 60 per cent of the shared variation of the risk premia on US and euro-area high yield and high grade corporate bonds, as well as equity risk premia. In addition the risk premia on emerging market debt was also included. For details on the methodology, see Slok, T. and M. Kennedy, "Explaining risk premia on bonds and equities", *Economic Studies*, No 40.
2. Companies that default as a percentage of all rated global companies; 12-month trailing average.

Sources: Datastream, Moody's, Moody's KMV, BIS calculations, OECD calculations, *Main Economic Indicators*, OECD.

Box 3. Are risk premia on riskier bonds too low?

In order to evaluate whether risk premia on higher-risk bonds are at levels that would be consistent with underlying fundamentals, or whether there are significant misalignments, a procedure similar in spirit to previous OECD work is used.¹ More precisely, for both the United States and the euro area, the spreads between high-yield, high-grade and emerging-market bonds with benchmark government bonds are first calculated. A common factor that captures the shared part in movements of these spreads is then identified and interpreted as a synthetic indicator for risk premia on bonds. The final step is to evaluate what drives this indicator of risk premia.

The cyclical position of the world economy, liquidity, short-term interest rates and expected corporate default rates emerge as the main explanatory variables (and combined have a very high degree of explanatory power):

$$\text{Synthetic Indicator} = 9.2 - 0.27 [-2.1] * \text{Global Liquidity} - 0.44 [-4.4] * \text{OECD Cyclical Position} + 1.6 [2.5] * \text{Global Real Short Rates} + 8.0 [17.0] * \text{Expected Global Corporate Default Rates}$$

Figures in square brackets are t values; the $R^2 = 0.82$.

Risk premia tend to fall when the cyclical outlook improves, are positively related with short-term rates and negatively related with liquidity and with corporate default rates, either actual or expected (as forecast by Moody's). While current risk spreads seem to be relatively well aligned with the above fundamentals, this assessment hinges critically on the assumption that expected default rates are not based on too optimistic assumptions. This cannot be taken for granted, as rating agencies have been repeatedly criticised for being "behind the curve". Moreover, the synthetic indicator is intended to summarise risk premia on different bond classes, so the finding that it is aligned with fundamentals does not mean that risk spreads on any single bond class are well aligned with fundamentals – it would, for example, not be surprising if it turned out that emerging market bond risk is currently priced too low.

1. Sløk and Kennedy (2005).

vided that data on global reserve accumulation are in fact capturing an increase in reserves in US dollars held offshore. The effects from high and increasing reserve accumulation in Asia are likely to have been reinforced – at least to some degree – by the recycling of increased oil revenues since 2004. The pension fund story could fit with a flattening yield curve insofar as it has been affecting the demand-and-supply balance in longer-term bond segments only in recent years, but that is difficult to corroborate and its impact would be less marked in continental Europe. Portfolio factors related to the collapse of stock prices in 2000 can also

help explain why high-yield bond spreads have been low in recent years. None of these portfolio factors could, however, have had such a strong effect on global bond yields if they had not been operating against a background characterised by an increased monetary policy predictability and low inflation volatility, which has favoured stability in longer-term expectations.

VI. How might the situation unwind?

The above discussion suggests that the categories of factors discussed in the three previous sections have all played a part in driving long-term interest rates lower, although probably at different times over the past 10-15 years. Lower inflation expectations and inflation uncertainty played a major role during the 1990s. An increased propensity to save in emerging economies (and cutbacks in investment, except in China) has been a major driver since the Asian crisis of 1997. And portfolio shifts toward bonds – as a result of both official reserve accumulation and a reluctance to move back into equities on the part of private investors – seem to have been the dominant factor in narrowing term premia since 2004. Since these factors have been cumulating, they are all part of the explanation for the current low level of bond yields.

Because some of those factors are likely to be lasting while others can be expected to unwind, their relative importance may have implications for assessing whether long rates will increase and the speed at which any adjustment may take place. The following checklist summarises a tentative assessment of how each of the elements may play out:

- Inflation expectations and perceived inflation risks are likely to remain moderate. Nevertheless, to the extent that current expectations of relatively low future policy rates reflect an extrapolation of recent experience, there is a risk that those expectations may prove to be over-optimistic. A reassessment might be triggered, for example, if new inflationary pressures were to force central banks to act more aggressively than markets are now anticipating. Moreover, to the extent that the more muted reaction of bond rates to changes in policy rates tends to weaken monetary policy transmission, it may end up requiring larger movements in policy rates.
- While cyclical and other temporary factors have been affecting saving-investment balances in industrialised countries, the net effect of their unwinding is uncertain. On the one hand, business fixed investment should accelerate once the phase of corporate restructuring is concluded. On the other hand, some degree of fiscal consolidation in the three major economies would tend to raise national saving. And a cooling off of housing markets would be expected to lead both to higher household saving and lower housing investment.

- As regards saving-investment balances in developing and emerging economies, only some of the factors that have led to *ex ante* excess net saving are likely to unwind. Current account surpluses in oil-exporting countries should narrow relatively quickly based on past re-spending patterns. In the case of Asian and other developing countries, if surpluses were motivated by a desire to strengthen financial positions, they will no longer be needed when the balance sheet adjustment is judged to have been completed, although when this will be the case is more difficult to predict. However, the reasons behind high savings are diverse – from a lack of job and income security (including a social safety net) to caution brought about by ongoing restructuring – and some of them may well persist. This is also true in the case of China, where it is also difficult to predict how the tension between distortions in the economy that induce overly strong investment and attempts to contain it through administrative controls will play out.
- Reserve accumulation in US dollars by China and other Asian countries will probably continue if these economies continue to experience current account surpluses and capital inflows. Although major changes in their exchange rate policies are unlikely in the short term, a slowdown in the pace of reserve accumulation cannot be excluded, either as a result of concern for the effects on domestic variables or because of international pressure to reduce trade surpluses. At the same time, dramatic portfolio shifts out of US bonds are unlikely given the largely non-yield oriented motives behind asset accumulation by official holders and their awareness that the effect of any such shift would be considerably amplified by the responses of private investors and could trigger large capital losses. This, however, does not rule out some form of quiet asset diversification.
- A normalisation of relative attitudes toward risk on equity and bond assets seems to be in progress and should go on, particularly if further stock market gains help memories of earlier losses to fade. On the other hand, however, the rebalancing of pension funds' and life insurance companies' asset portfolios from equities to bonds should continue in coming years as the large baby-boom cohorts draw closer to retirement.

On the whole, the analysis suggests that bond yields are unlikely to go back to the levels that prevailed in the 1980s or the early 1990s, as several of the factors identified as driving them lower are set to persist and will probably outweigh the factors making for an upward correction. While uncertainty about the level of prospective short-term rates may increase as output gaps are closed (and this may have been a factor in the bond-market adjustment in the first half of 2006), the hard-won credibility of monetary policy should endure and the beneficial effects of globalisation and competition on inflation seem well established. High *ex ante*

net saving on the part of oil-producing countries may be expected to run its course, and investment ratios in industrialised economies could rise, but high saving may be of a more structural nature in countries such as China. Some of the compression in term premia could unwind if portfolio preferences were to shift against fixed income instruments, or expectations of corporate default rates were to change, but the pace of reserve accumulation in Asian economies is unlikely to slow dramatically given the perceived importance of exchange rate stability for development.

Notes

1. Several studies have found that fiscal positions tend to have a significant effect on real long-term interest rates. See Engen and Hubbard (2004) for an overview of the empirical literature. See also Friedman (2005), Orr *et al.* (1995) and Laubach (2003).
2. See Rajan (2006).
3. Zero-coupon yields can be decomposed into a sequence of short-term forward rates, which can be seen as risk-adjusted expected spot rates at the corresponding horizons. If market participants were risk-neutral, the “naïve” version of the expectations hypothesis would hold, and arbitrage would ensure that forward rates exactly reflect expected spot rates. Under risk aversion, the two will differ by a term premium, which can vary over time.
4. For a survey of the role of factor models of the term structure in forecasting short rates, and hence term premia, see Diebold, Piazzesi and Rudebusch (2005). The three factors roughly correspond to level, slope and curvature and are constructed (latent) variables; in economic terms they relate, respectively, to longer-term influences (inflation and growth), which affect yields of all maturities; business-cycle effects which affect mainly shorter maturities and are mean-reverting as the central bank fulfils its dual mandate to maintain price stability and stabilise the real economy; and more transient factors which are difficult to relate to systematic economic influences: see, for instance Duffee (2000).
5. See Kim and Wright (2005) and Kim and Orphanides (2005). The forward term premium is derived as the difference between the forward rate and the expected future short rate – as calculated from the three factor loadings.
6. Federal Reserve Board calculations, based on the same method as described in Kim and Wright (2005).
7. The term premium on 10-year yields should be normally lower than that on long-horizon forward rates (shown in Figure 8), since it is an average of term premia on forward rates over horizons up to ten years.
8. Diebold *et al.* (2004) give time series plots of the three factors showing that the first (level) factor was most responsible. In general, until recently, the first two principal components (level and slope) accounted for almost all variations in the term structure (see Diebold *et al.*, 2005).
9. See Laubach and Williams (2003), Wu (2005) and OECD *Economic Outlook* 76, December 2004, pp. 24-25.
10. In principle, lower expected average short rates could be seen as resulting from either a fall in the “neutral” rate or from the expectation of a skewed expected distribution, *i.e.* an expectation that policy rates will be below neutral most of the time.

11. The figure shows the dispersion of individual forecasts of long-term average inflation in the Philadelphia Fed's *Survey of Professional Forecasters*, which can be regarded as an indirect measure of inflation uncertainty. The dispersion declined during the 1990s, but has not fallen further since 2000.
12. Empirical research suggests that bond yields are driven to a significant extent by inflation volatility. See, for example, Ang *et al.* (2005) who find, using a no-arbitrage term structure model, that 61 per cent of the variance of the 5-year yield can be attributed to movements in inflation and GDP growth and over 95 per cent of the variance in the 5-year term spread is due to time-varying inflation risk.
13. Bernanke *et al.* (2004).
14. It should be noted that it is difficult to compare savings rates across countries, and hence cross-country aggregates should be viewed with a sound amount of caution. See Boissinot and Catte (2006) on the issue.
15. It should be mentioned in this respect that lower investment ratios with respect to GDP do not necessarily imply lower investment in volume terms as investment prices have declined in relative terms in recent years.
16. See Rajan (2006). Measured at constant prices, gross investment ratios have been approximately constant. Net investment ratios, however, have been declining even after correcting for relative price changes, as the switch to ICT-intensive investment has been accompanied by more rapid depreciation: see OECD *Economic Outlook* No. 79 2006, Box I.1 for a discussion.
17. See Bernanke (2005) and Roubini and Setser (2005).
18. This behaviour reflects, to some degree, the limited access of households to credit, political uncertainty and concerns over ageing in the absence of an adequate social safety net. This trend seems likely to persist (see OECD *Survey of China* 2005), and to outweigh that towards higher investment ratios which have emerged more recently. However, it is probably less important as a factor behind low interest rates than official reserve build-up which constitutes the bulk of the foreign asset accumulation of emerging markets.
19. Warnock and Warnock (2005) estimate that if capital flows into the United States went back to average levels, this would lead to a rise in interest rates by around 100 basis points (and if they stopped altogether interest rates may rise by up to 150 basis points).
20. In Japan, in addition, the low short and long-term domestic interest rates associated with the quantitative easing monetary policy have encouraged private outflows into US corporate and agency debt.
21. As a result, official dollar reserves in China (including Hong Kong) have now surpassed those in Japan; these amount to around USD1 trillion and USD800 billion, respectively. Reserve accumulation in China and in some other countries exceeded the value of current account surpluses, which would seem to indicate that capital inflows into Asian countries have indirectly found their way into US treasury bonds (via Asian central banks).
22. See Dooley *et al.* (2003, 2004, 2004a, 2005).
23. Warnock and Warnock (2005) estimate that US rates would have been 60 basis points higher if official flows had been zero in 2004 and early 2005, which is significant but relatively modest given that zero official flows are a relatively strong assumption. See also Bernanke *et al.* (2004), Truman (2005), Goldman Sachs (2004) and JP Morgan (2005).

24. See Higgins and Klitgaard (2004). McCauley (2005) estimates that about one-quarter of the stock of official reserve holdings are held offshore, and their share in the net accumulation can vary considerably from year to year. See also Roubini and Setser (2005).
25. In principle, the discrepancy between the two sets of data could also be explained by a decline in the share of reserves held in US dollars. However, there is no evidence of a trend toward reserve diversification, which would also be difficult to reconcile with the appreciation of the US dollar in 2005.
26. While the current account surpluses of oil exporters massively increased in 2005, probably by around USD320 billion to a total of around USD370 billion, the estimated reserve accumulation was somewhere around USD50 billion, which is fairly small in comparison with the approximately USD500 billion of reserves that non-oil exporters are likely to have accumulated in 2005.
27. For several – partly political – reasons it is also likely that most investment into US assets would be channelled via intermediaries so as to obscure their real owners
28. Many pension funds experienced large funding gaps after the 2001 stock market downturn and, possibly even more importantly, because of the decline in interest rates, which implied large increases in the present value of the pension liabilities.
29. See, for example, BIS *Quarterly Review* March 2005. In some major OECD economies the assets held by pension funds are equivalent to around 20 per cent of total financial assets.
30. See Schich and Weth (2006).
31. From the supply side, probably the most notable recent supply development was the issuance of bonds with maturities of 50 years and durations exceeding 20 years. Such bonds were recently issued both by the French and the UK governments and other countries are considering the issuance of such instruments. The United Kingdom has recently issued 50-year inflation-indexed debt. The US Treasury reintroduced the 30-year bond in February 2006, after it had discontinued its issuance in October 2001. From an issuers' perspective, ultra-long-term bonds allow them to lock in the current relatively low borrowing costs for a very long horizon.
32. In the United States, it appears that the insurance agency for private pension plans, the Pension Benefit Guaranty Corporation, has bought large amounts of long-dated government securities to reduce the mismatch between assets and liabilities of the funds for which it becomes trustee when an underfunded corporate pension plan becomes insolvent. In the United Kingdom, pension fund bond allocations rose from 25 to 39 per cent between 1998 and 2004 after minimum funding requirements for UK pension funds were introduced in 1997, and inflation-linked 50-year gilt yields hit all-time lows in early 2006 with spreads of 38 basis points.
33. A concern in the United Kingdom has been that falling yields on long-term bonds increase the present value of company defined-benefit pension liabilities, which induces companies to buy more long bonds in order to match assets to liabilities, which further drives down bond yields and increases corporate pension liabilities – a destabilising process which has led to demands for the government to increase the supply of long bonds.
34. According to US flow of funds data, in 2003-2004 private, federal and state and local pension funds combined were net sellers of Treasury securities, and their purchases of government agency-backed, corporate and foreign securities were broadly in line with earlier trends.
35. See "When the spinning stops", *The Economist*, 26 January 2006.

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Résumé : Éléments à l'origine de la faiblesse des taux d'intérêt à long terme

Au cours des années récentes les rendements des obligations à long terme ont été faibles tant en termes nominaux qu'effectifs. Par rapport aux cycles économiques antérieurs, ils ont réagi différemment aux changements de politique monétaire et budgétaire, notamment aux États-Unis. Cet article examine plusieurs explications potentielles de ces comportements comme les effets d'un changement de cadre de la politique monétaire sur l'inflation et les anticipations de taux d'intérêt; l'évolution des soldes *ex ante* d'épargne et d'investissement et les changements de préférence dans les placements des investisseurs (y compris l'accumulation des réserves officielles, le recyclage des " pétrodollars " et la demande des fonds de pension pour des obligations à maturité longue). L'article conclut qu'il est improbable qu'une seule explication puisse rendre compte du niveau et du profil des rendements obligataires au cours des dernières années. Toutefois, un élément clef a été la réduction de la prime de risque, accompagnée par des changements dans les anticipations de taux d'intérêt à court terme. Néanmoins, bien que les rendements des obligations aient commencé à remonter au début de l'année 2006, il est peu vraisemblable qu'ils atteignent les niveaux enregistrés dans les années 1980 et au début des années 1990, dans la mesure où plusieurs des facteurs qui ont entraîné leur déclin sont amenés à perdurer.

Abstract: The Impact of Pension Funds on Financial Markets

This paper empirically explores the impact of pension funds on market volatility, equity prices, government and corporate bond yields for a panel of 24 countries. The results show a positive and statistically significant relationship between market volatility and pension assets. It complements micro evidence (Dennis and Strickland, 2002) as well as macro findings (Davis, 2004). In addition, equity prices are found to be positively correlated with pension funds, a finding observable for both OECD countries and emerging market economies (EMEs) and present in both the short and long terms. Furthermore, there is evidence indicating a negative link between pension fund assets and both corporate and government bond yields. This might be due to the sizeable buying effects of pension funds, particularly when governments have the tendency to use pension funds to finance implicit pension debts when the traditional pay-as-you-go systems shift to funded systems.

The Impact of Pension Funds on Financial Markets*

I. Introduction

It has been widely recognised that the trading behaviour of institutional investors has a potential impact on stock market volatility as well as asset prices. For example, other things being equal, including supply conditions in particular, equity prices may be driven up as a result of an increase in demand from institutional investors, such as *e.g.* pension funds. Such a scenario may occur due to a fall in the risk premium required by these investors (Ang and Maddaloni, 2003; Blanchard, 1993). Such heightened demand could even give rise to the development of stock market bubbles, which would be a concern from the financial stability point of view as bubbles may burst with potentially adverse consequences for financial institutions.

Theorists, however, still do not agree on the role played by institutions in financial markets, particularly with regard to the effect of their trading on stock market volatility. Some maintain that institutions, *e.g.* pension funds, are more sophisticated and informed investors than individuals; therefore, they should help the stock market restore long-run equilibrium. This interpretation is in line with the rational market model proposed by Fama (1965). In this model, heterogeneous agents trade irrationally, but such irrational trading cannot affect asset prices in a substantial manner as there are always sophisticated investors who trade against those that trade irrationally, thus eliminating any potential long term deviations of equity prices from fundamentals.

In contrast to the above, some theoretical models suggest that institutions are engaged in herding behaviour and positive feedback trading, thereby destabilising

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equity markets (Lakonishok *et al.*, 1992). DeLong *et al.* (1990) propose a model arguing that the existence of rational speculators, *e.g.* institutional investors, could destabilise financial markets by driving asset prices beyond their fundamental values. The positive feedback hypothesis argues that the market features positive-feedback traders who predictably extrapolate past price trends, and buy when prices rise and sell when prices fall. Based on their model, assuming institutions are rational investors, it is profitable if those investors purchase/sell ahead of the positive feedback traders. While this rational behaviour is justifiable, it may lead to a substantial deviation of prices from fundamentals as more transactions by rational investors create an ever higher volume of speculative trading by positive feedback traders.

The destabilising effect could be reinforced by herding. Herding behaviour means institutions have incentives to trade in line with the market movements regardless of whether such investment decisions lead to profit or loss. Froot *et al.* (1992) designed a model explaining, at least to some extent, the validity of the claim for the existence of herding. Institutions are long-term investors, but the managers working for institutions are short horizon investors as they are subject to regular performance evaluation (Davis and Steil, 2001). In this context, their model provides reasoning suggesting that institutions focus on short horizons, and ignore valuable information that may have a long-term impact on equity prices.

The remaining part of the paper is organised as follows: Section II reviews the literature relating to the link between market volatility and institutions in general, and pension funds in particular. Section III first introduces and describes the range of data used in this study. The dataset covers 24 countries, including 16 OECD countries and 8 EMEs, with the observation period from 1960 to 2004. The section then sets up the econometric specifications, *i.e.* a panel error correction model and another dynamic panel model. The end of section III presents the empirical results, *i.e.* impacts of pension assets on market volatility, asset prices and bond yields. Section IV concludes this paper by summarising the main results and suggesting future work.

II. Empirical literature

Micro-evidence

Like the theoretical results regarding the relationship between institutions and equity prices as discussed above, results from empirical work on this relationship are also mixed. Most empirical research in this area is conducted for the United States. Given the easy accessibility of data, much empirical work is based on quarterly data.¹ By using quarterly data from 1981:Q4 to 1996:Q4, and applying Granger causality tests with the optimal lag length determined by the Akaike Information Criterion (AIC), Cai and Zheng (2004) find that institutions engage in positive feedback trading, as the lagged return is positively correlated to net insti-

tutional demand; this result is consistent with that of other work by Burch and Swaminathan (2002), where quarterly aggregated institutional holdings data between 1982 and 1996 are used. In addition, Cai and Zheng give evidence that returns are negatively correlated with lagged institutional demand when swapping the dependent and independent variables in the Granger causality regression. This finding is in line with the price pressure hypothesis, which holds that institutional trading can exert temporary price pressure, but stock returns should show reversals when prices return to their equilibrium.

Much current work relies on quarterly data, but this frequency might not be sufficiently high to identify the impact of institutions if any such effects take place in a shorter time interval, *e.g.* weekly or daily. Edelen and Warner (2001) looked at the relationship between mutual fund flows and market returns in the United States, using daily and, in some cases, intraday hourly data provided by a financial firm. It is noted that the sample period covers just over 1 year, from 2 February 1998 to 30 June 1999. They used similar methodology to that in Cai and Zheng (2004) with daily flow regressed on current and past market returns as well as past flows. The positive feedback hypothesis is confirmed in this study, complementing the results using quarterly data. In addition, Sias (1996) investigated the impact of institutional trading on market volatility, which is measured by the standard deviation of weekly stock returns. After controlling for capitalisation, contemporaneous regression indicates a positive association between volatility and institutional holdings of individual stocks in the sample period of 1977 to 1991.

The literature reviewed above involves using aggregate data on US institutional holdings. One main limitation with aggregate data is that it does not disentangle the potentially different roles played by different types of institutions in the institution-equity price nexus. For example, Davis (2002) identifies key differences between life insurance companies and pension funds, which might have implications for investment practices, and further, for the institution-equity price nexus.

A number of studies have been conducted in an effort to tackle this issue. With daily data between 1 January 1988 and 31 December 1996, Dennis and Strickland (2002) examined the linkage between returns and aggregated and segregated institutional ownership in the United States. Returns of stocks are related to 16 event days, which are defined as days when the absolute value of the returns of the market portfolio is greater than two per cent. Their results give evidence that aggregate institutional trading moves in the direction of the market; in other words, when the market is sharply positive (negative), institutions trade more (less). The results are obtained controlling for liquidity (Falkenstein, 1996) and capitalisation (Lakonishok *et al.*, 1992), as in Sias (1996).

When the institutional data are decomposed into four different types of institutions, *i.e.* banks, insurance companies, pension funds and mutual funds, however,

Dennis and Strickland's (2002) results differ from the previous ones. Pension funds and mutual funds move in the direction of the market,² while banks move in the opposite direction to the market. Specifically, during up (down) days, pension funds and mutual funds buy (sell), while the banks sell (buy). Dennis and Strickland explain this is because mutual fund and pension fund managers are subject to more frequent scrutiny than the managers of bank trust funds, therefore, the former have incentives to herd in the stock market (Davis and Steil, 2001; Scharfstein and Stein, 1990), which is also in line with the theoretical arguments in the previous section (Froot *et al.*, 1992). Dennis and Strickland's (2002) findings are robust, even when they use an orthogonalisation technique which is believed to remove the potential correlation between independent variables in the regressions.

Jones *et al.* (1999) carried out another study investigating the relationship between stock prices and different types of institutions in the United States. They used quarterly data between 1984 and 1993. They found evidence that all institutions are engaged in positive feedback trading, but there is no evidence that institutions destabilise equity prices. For example, stocks that witnessed net selling by institutions had large negative returns, but such large negative returns were also observed for stocks with net institutional buying. This finding is consistent with Wermers (1999) where only mutual funds were investigated.

An earlier study by Lakonishok *et al.* (1992) examined the impact of pension funds on stock prices in the United States. In their paper, they used a dataset covering 769 all-equity pension funds on a quarterly basis, from 1985 to 1989. One main finding is that the sample pension funds did not herd, which is revealed by the small value of mean herding measure (-0.027). This number is calculated using the herding statistics proposed in the before-mentioned paper by Lakonishok *et al.* (1992).³ The number 0.027 implies that there is roughly the same number of pension funds selling and buying. Therefore, herding does not exist in this case.

In addition, using a dataset covering the 1983-1998 period and consisting of 23 501 firms, Cohen *et al.* (2002) conclude that there is no strong evidence supporting the positive feedback hypothesis. In their paper, a VAR model is used to compute a measure of cash-flow news that is believed to be able to better capture new information relating to all future cash flows. They found that when prices increase 25 per cent in the absence of any cash-flow news, institutional investors sell around 5 per cent of their shares, instead of buying shares. This is obviously contrary to the positive feedback hypothesis.

Another empirical study focuses on the Polish pension fund market. From 19 May 1999 onwards, Polish pension funds were allowed to invest in the Polish securities market and became an important player in the market. Gebak *et al.* (2003) looked at the issue of institutional trading and stock return autocorrelations by using daily data from 1 July 1998, to 30 December 2000. The results from a GARCH (1.1) model

indicate that institutional trading in Polish pension funds does not have any correlation with stock returns. This finding is robust when the whole sample period is divided into three different sub-sample periods, as well as when using a non-linear autoregression-cum-GARCH model which is believed to remove any possible misspecification associated with the simple GARCH (1.1) Model.

In addition, by using event-study methodology, Chan-Lau (2004) gives evidence that foreign investment by pension funds in emerging markets has a negative short-run impact on local stock markets; this finding, however, is restricted to Asian countries. On 22 February 2002, the California Public Employees Retirement System (Calpers) announced its withdrawal from Indonesia, Malaysia, the Philippines, and Thailand, as these countries did not comply with Calpers investment standards, particularly on the non-financial side (Clark and Hebb, 2004). Following this announcement, the stock markets in most countries declined significantly during the next two days, but the markets recovered afterwards. Meanwhile, when Calpers used the same investing approach for Argentina, Peru and Turkey on 12 February 2004, the markets did not swing very much.

Macro-evidence

The section above reviewed the literature on the relationship between equity prices and institutions in general – and pension funds in particular – at the micro-level. Research on the same issue at the macro-level, however, is relatively scarce to our knowledge. One major study was conducted by Walker and Lefort (2002). By using a dataset from 33 emerging markets, Walker and Lefort conclude that the growth of pension assets in these countries dampens stock market volatility, which is proxied by the 24 month annualised moving volatilities. Among other determinants, inflation is used as a proxy for macro-economic stability, and bank assets as a proxy for capital market development. Other independent variables include *per capita* income, initial conditions and the region which is used to capture heterogeneity across countries. But their empirical models might be mis-specified as a number of important explanatory variables, *e.g.* interest rates and consumption, are missing. In addition, even if their results are valid, the extent to which they are relevant to OECD countries has not been tested.

In addition, Davis (2004) conducted an empirical study on G-7 countries and showed that equity price volatility and the share of equity held by pension funds and life insurers are positively linked. In other words, in the selected advanced economies the growth of equity holdings by institutional investors gives rise to heightened stock market volatility. The finding, however, does not answer the question of whether the institutions' growth *per se* contributes to or dampens the stock market volatility. Meanwhile, his study uses aggregated data covering both pension funds and mutual funds, therefore the results may be blurred by the

potentially different roles played by pension funds and mutual funds in the financial markets (Dennis and Strickland, 2002; Lipson and Puckett, 2005).

Besides the relationship between pension assets and equity prices as well as stock market volatility, the growth of pension fund assets may have an impact on bond yields. The theoretical intuition is that with the rapid growth of a pension fund industry, more and more assets are available and invested in equities and bonds. The immediate effect is high demand for these types of investment instruments. Following this, asset prices rise as there is excess demand. Therefore, when bond prices increase, the corresponding yields decrease.

The current literature in this field often focuses on the relationship between demographics and asset prices. A recent literature review by Bosworth *et al.* (2004) shows that in many empirical studies, the population's age structure is significantly related to asset prices. With a panel estimation of seven OECD countries, Davis and Li (2003) found that a high proportion of the population aged 65 and over exerts downward pressure on asset prices, while the percentage of the population aged 40-65 has the opposite impact, due to the relatively higher saving of the latter group. For example, the coefficient of AGE65, proxying for the relative share of people aged 65 above, is -0.008 in the real stock price regression. In contrast, other studies, including a country study of the United States (Poterba 2001) and an international study on 16 countries (Cannon 2003), do not find robust evidence for a strong relationship between demographic variables and equity prices. Poterba (2004) argues that the inconsistency between current empirical findings might be due to the different econometric specifications.

Other considerations

Research on the link between financial asset prices and institutions in general, and pension funds in particular, is extensive at the micro-level. A number of limitations, however, are observable, thus justifying further empirical research.

First, most studies are focusing on the US market, particularly regarding the issue of equity prices, volatility and institutional trading. Therefore, an international study drawing on data related to other countries would be worthwhile.

Second, even though in some work where cross-country data is used, *e.g.* Walker and Lefort (2002) and Davis (2004), pooling data across both developed and developing countries may be justified, as by using pooled data the potentially different impacts may be discernible.

Third, the observation period in previous work has been relatively short. For example, regarding the link between equity prices and institutional trading in the United States, the sample period is typically less than 20 years as, *e.g.*, in

Lakonishok *et al.* (1992) and Dennis and Strickland, 2002). On the one hand, this is to some extent justified by the nature of their research as they use high frequency data, *i.e.* daily or quarterly. On the other hand, the short periods sampled may not be long enough to observe the long-run effects, particularly given concerns regarding business cycles.

Fourth, in many cases, pension funds are entangled with other institutional investors, *e.g.* mutual funds, blurring the impacts of different institutions on asset prices. Therefore, a study using pensions data alone should be able to complement the current literature.

III. Assessing the impact of pension funds on financial markets

Data and variables

The dataset used for the present study covers 16 OECD countries and 8 emerging market economies (EMEs), thus 24 countries were investigated overall. The observation period is from 1960 to 2004, which is believed to be long enough to identify long run effects (see Table 1 for details).

The dependent variables are stock market equity price volatility (VOL), equity prices (EQP) in both real and nominal terms, and corporate and government bond yields (CBY/GBY) in both real and nominal terms. VOL is defined as the annual standard deviation of monthly changes in real equity prices. This definition of the monthly standard deviation is in line with Davis (2004), but different from Schwert (1998), Arestis *et al.* (2001), who use a moving average technique on monthly or quarterly data. But, as claimed by Eichengreen and Tong (2002), results based on both methods are very similar. Equity prices (EQP) are measured by the respective countries' stock market price indices, while bond yields (BNDY) are proxied by the respective countries' government bond yields. Regarding the conversion of EQP nominal values to real values, a method consistent with Shiller (2000) is used. Based on this method, the EQP in real terms is calculated by deflating the nominal EQP by the relevant CPI indices. A similar procedure is used in Davis and Li (2003). All dependent data were obtained from Datastream and Jakob Madsen.

Turning to the independent variables, pension fund growth is proxied by the ratio of pension fund assets relative to GDP, *i.e.* PFAGDP, which has been widely used in the current pensions literature (Davis and Hu 2004, Walker and Lefort 2002). This indicator is always used to measure the significance of pension assets relative to the whole economy. Pensions data were collected from a range of sources, including OECD (2003), Davis and Steil (2001), as well as national sources. See Hu (2005) for details.

Besides PFAGDP, a range of other economic indicators which are believed to be the determinants of the dependent variables were identified. Two macroeco-

Table 1. **Observation period for all variables (16 OECD countries + 8EMEs)**

	EQP_ Nominal	EQP_ Real	VOL	CBY	GBY	PFAGDP	GDPGR	INFL	INT	CON	POP65	POP40
OECD (16)												
Australia	1960-2004	1960-2004	1960-2004	1967-2004	1960-2004	1970-2003	1960-2003	1960-2004	1975-2004	1960-2002	1960-2004	1960-2004
Austria	1960-2004	1960-2004	1960-2004		1960-2004	1993-2001	1960-2003	1960-2004	1998-1999	1960-2002	1960-2004	1960-2004
Belgium	1960-2004	1960-2004	1960-2004		1980-2003	1981-2001	1960-2003	1960-2004	1981-2004	1960-2002	1960-2004	1960-2004
Canada	1960-2004	1960-2004	1960-2004	1967-2003	1960-2003	1966-2003	1965-2003	1960-2004	1960-2003	1965-2001	1960-2004	1960-2004
Denmark	1960-2004	1960-2004	1960-2004	1967-1995	1960-2003	1966-2003	1960-2003	1960-2004	1978-2002	1960-2002	1960-2004	1960-2004
Italy	1960-2004	1960-2004	1960-2004	1983-1998	1960-2003	1990-2001	1960-2003	1960-2004	1978-2003	1960-2002	1960-2004	1960-2004
Japan	1960-2004	1960-2004	1960-2004	1967-2004	1960-2003	1969-2003	1960-2003	1960-2004	1960-2003	1960-2002	1960-2004	1960-2004
Luxembourg	1960-2002	1984-2002	1980-2004		1960-1999	1985-1996	1960-2003	1960-2004	1980-1998	1960-2002	1960-2004	1960-2004
Netherlands	1960-2004	1960-2003	1960-2004	1968-1998	1960-2003	1966-2003	1960-2003	1960-2004	1978-2004	1960-2002	1960-2004	1960-2004
Norway	1960-2004	1969-2004	1960-2004		1960-2004	1980-2001	1960-2003	1960-2004	1979-2003	1960-2001	1960-2004	1960-2004
Portugal	1960-2004	1987-2004	1990-2004	1990-2004	1960-2004	1989-2001	1960-2003	1960-2004	1976-1999	1960-2001	1960-2004	1960-2004
Spain	1960-2004	1960-2003	1960-2004	1986-1998	1960-2003	1988-2003	1960-2003	1960-2004	1978-2002	1960-2002	1960-2004	1960-2004
Sweden	1960-2004	1960-2003	1960-2004	1966-2003	1960-2004	1966-2000	1960-2003	1960-2004	1970-2003	1960-2002	1960-2004	1960-2004
Switzerland	1960-2002	1966-2002	1960-2001	1967-2004	1960-2004	1970-2003	1960-2003	1960-2004	1981-2004	1960-2001	1960-2004	1960-2004
UK	1960-2004	1960-2004	1960-2004	1967-2004	1960-2003	1963-2003	1960-2003	1960-2004	1967-2004	1960-2002	1960-2004	1960-2004
USA	1960-2002	1960-2004	1960-2001	1967-2004	1960-2004	1966-2003	1960-2003	1960-2004	1960-2004	1960-2002	1960-2004	1960-2004
EMEs (8)												
Argentina	1987-2004	1987-2004	1988-2004	1993-2004		1994-2003	1960-2003	1960-2004	1994-2004	1960-2003	1960-2004	1960-2004
Indonesia	1990-2004	1990-2004	1990-2004	1997-2004		1991-1996	1960-2003	1960-2004	1986-2003	1960-2003	1960-2004	1960-2004
S. Korea	1987-2004	1987-2004	1987-2004	1992-2004	1974-2003	1980-2000	1960-2003	1967-2004	1980-2003	1995-2003	1960-2004	1960-2004
Mexico	1987-2004	1987-2004	1988-2004	1993-2004	1995-2003	1997-2003	1960-2003	1960-2004	1993-2004	1960-2003	1960-2004	1960-2004
Philippines	1987-2004	1987-2004	1987-2004	1997-2004	1994-2003	1985-2002	1960-2003	1960-2004	1976-2003	1960-2003	1960-2004	1960-2004
Poland	1994-2004	1994-2004	1994-2004			1998-2004	1990-2003	1971-2004	1979-2003	1990-2003	1960-2004	1960-2004
Singapore	1972-2004	1972-2004	1973-2004		1988-2004	1983-2003	1960-2003	1960-2004	1978-2004	1960-2003	1960-2004	1960-2004
South Africa	1972-2003	1972-2003	1973-2004	1997-2004	1966-2004	1980-1997	1960-2003	1960-2004	1960-2004	1960-2003	1960-2004	1960-2004
Main source:	Madsen Data- Stream	Madsen Data- Stream	Madsen Data- Stream	Data- Stream	Madsen Data- Stream	OECD (2003) National Source	WDI (2005)	IMF (2005)	WDI (2005)	WDI (2005)	UN (2004)	UN (2004)

Notes: Key: EQP_Nominal: equity prices in nominal term. EQP_Real: equity prices in real term. VOL: equity real price volatility. CBY: corporate bond yield. GBY: government bond yield. PFAGDP: pension fund assets/GDP. GDPGR: GDP growth rate. INFL: inflation rate (GDP deflator). INT: real interest rate (lending interest rate adjusted for inflation). CONGR: consumer spending growth rate. POP65: population aged 65+ relative to total population. POP40: population aged 40-65 relative to total population. WDI: World Development Indicators (World Bank).

Sources: As shown in the Table.

conomic stability indicators, the inflation rate (INFL) and real interest rate (INT), are employed in this paper. The intuition is that the more volatile the economy – reflected in high inflation rates and interest rates – the greater stock market volatility is. INFL is calculated as the changes in the consumer price index (CPI), while INT is the lending interest rate adjusted for inflation. Meanwhile, GDP growth rates are included to measure the impact of the overall development of the national economy on the relevant dependent variables.

Meanwhile, in line with the literature investigating the relationship between demographics and assets prices (Davis and Li, 2003; Poterba, 2001, 2004), two demographic indicators, *i.e.* the ratio of the population aged 65+ and the ratio of the population aged between 40-65 are used. Other age groups, *e.g.* 20+ are excluded, given concerns about potentially overstating the problem (Yoo 1994).

Besides the above variables, consumer expenditure (CON) was introduced as another variable. CON is argued to negatively correlate to stock price movement (Shirvani and Wilbrattie 2000). In addition, applying Johansen's co-integration procedure, Choudhry (2003) found that in the United States consumer expenditure (measured by four different indicators) and stock market volatility have a significant long-run relationship. The author also gives evidence of a causal link between market volatility and consumer expenditure.

Regarding the data sources, GDP growth rates and CON are from World Development Indicators (2005), INFL and INT from the IMF online database, demographic data from the United Nations demographic database (2004), and PFAGDP from the OECD Institutional Investors (2003) and national sources where necessary (see Table 1 for details).

Econometric specification

In the paper, the main econometric specification used is a panel error correction model, as given below:

$$DLog(Y) = \beta_1 DLOG(PFAGDP)_{i,t} + \beta_2 DLOG(X1)_{i,t} + \beta_3 DLOG(X2)_{i,t} + \beta_4 ECM_{i,t-1} + \beta_5 LOG(PFAGDP)_{i,t-1} + \beta_6 LOG(X1)_{i,t-1} + \beta_7 LOG(X2)_{i,t-1} + \varepsilon_i + v_{i,t} \quad (1)$$

$$ECM_{i,t-1} = LOG(Y)_{i,t-1} - \lambda_1 LOG(PFAGDP)_{i,t-1} - \lambda_2 LOG(X2)_{i,t-1} \quad (2)$$

$$v_{i,t} : IID(0, \sigma^2)$$

D is the first difference, and LOG is the natural logarithm. Subscript *i* is the country dimension while subscript *t* indicates the time dimension. Y is a vector of dependent variables, *i.e.* stock market volatility, equity prices and bond yields in both real and nominal terms. X1 represents the two macro-stability indicators,

i.e. INT and INFL. X2 is vector of any other variables believed to be determinants of the dependent variables, *e.g.* demographic determinants, POP65.

ECM, according to the error correction model, is the central term in regression, which measures the speed of convergence from short run to long run equilibrium. Note that the values of the ECM term should be negative if there is a co-integration relation. Coefficients of DLOG variables show the short run relationship, while those of LOG variables show the long run relationship. Note that as specified below INFL and INT are stationary, so the level terms of these two variables in line with Hu (2005) are used. In addition, neither is included in the ECM term, as they are I(0) variables and should not affect the cointegration test (Deme- triades and Luintel, 1996) (see Table 2 for results of panel unit root tests).

The error correction model (ECM) was originally popularised by Davidson *et al.* (1978). The advantage of the panel error correction model is its ability to iden-

Table 2. Panel unit root test results. (24 countries: 16OECD + 8EMEs)

	LLC	IPS	Hadri	LLC	IPS	Hadri
L(EQP_Real)	3.866	4.132	14.964	-17.854	-16.853	4.840
	1.000	1.000	0.000	0.000	0.000	0.000
L(EQP_Nominal)	3.074	5.067	20.166	-24.128	-22.751	2.533
	0.999	1.000	0.000	0.000	0.000	0.006
L(VOL)	-6.603	-7.573	18.765			
	0.000	0.000	0.000			
LCBY	-1.102	0.525	6.220	-9.640	-8.907	-0.500
	0.135	0.700	0.000	0.000	0.000	0.692
L(CBY-INFL)	1.917	1.809	9.367	-4.451	-4.899	1.289
	0.972	0.965	0.000	0.000	0.000	0.099
LGBY	1.844	2.335	5.227	-21.110	-18.257	7.061
	0.967	0.990	0.000	0.000	0.000	0.000
L(GBY-INFL)	6.459	-3.135	3.394	-21.252	-20.834	1.812
	1.000	0.000	0.000	0.000	0.000	0.035
LPFAGDP	-2.221	-3.438	12.458	-58.840	-21.935	7.076
	0.013	0.000	0.000	0.000	0.000	0.000
LGDPCR	-2.173	-5.234	10.666	12.172	-4.936	0.193
	0.015	0.000	0.000	1.000	0.000	0.423
LINFL	-2.434	-3.510	4.999			
	0.008	0.000	0.000			
LINT	-0.704	-4.147	5.048			
	0.241	0.000	0.000			
LCONGR	-0.361	-2.214	7.389	-5.541	-8.929	-0.603
	0.359	0.013	0.000	0.000	0.000	0.727
LPOP65	-2.482	1.741	21.186	-2.760	-2.708	11.389
	0.007	0.959	0.000	0.003	0.003	0.000
LPOP40	7.203	5.246	17.840	-3.207	-0.992	15.731
	1.000	1.000	0.000	0.001	0.161	0.000

Notes: Key: see Table 1. L: log. Panel unit root tests are based on Im, Pesaran and Shin (2003), Levin, Lin and Chu (2002) and Hadri (2000). The null hypothesis of IPS and LLC is non-stationarity, while that of Hadri is stationarity.

Source: Author's calculations.

tify simultaneously in a panel of countries the short-run and long-run relationships between economic variables (Banerjee, Hendry and Smith 1986) as well as testing the co-integration hypothesis in the presence of lag terms (Pesaran and Shin 1995). This technique has been widely used by researchers, most recently by *e.g.* Barrell and Davis (2004), Pelgrin and Schich (2004), and Hu (2005).

The panel ECM is an appropriate methodology in this context, in that it is believed that the impact of pension fund asset growth on dependent variables might be dynamic in nature. Davis and Hu (2004) found that pension asset growth has a generally positive impact on output across 38 OECD countries and EMEs, but the impact shows spikes during a 25-year period.

In addition to the panel error correction model, another econometric model, designed to facilitate the analysis of equity price volatility was used.

$$\begin{aligned} \text{Log}(Y) = & \beta_1 \text{DLOG}(\text{PFLAGDP})_{i,t} + \beta_2 \text{DLOG}(X1)_{i,t} + \beta_3 \text{DLOG}(X2)_{i,t} + \\ & \beta_4 \text{LOG}(\text{PFLAGDP})_{i,t-1} + \beta_5 \text{LOG}(X1)_{i,t-1} + \beta_6 \text{LOG}(X2)_{i,t-1} + \varepsilon_i + \nu_{i,t} \end{aligned} \quad (3)$$

Equation 3 is similar to Equation 1, but the dependent variable in Equation 3 is in levels, *i.e.* LOG(Y), rather than first differences, *i.e.* DLOG(Y) in Equation 2. The specification is taken from Davis (2004) with the view that equity price volatility (VOL_PR) is a stationary variable. In addition, X1 is presented in log-differences rather than logarithms as in Equation 2, because here we seek to look at the dynamic structure of variables and so the co-integration issue is not relevant.

For both models the fixed effect approach is used. The advantage of the fixed effect model over the random effect model is that the former allows the ε_i to be correlated with the independent variables. In addition, ε_i is allowed to vary across countries, thus capturing the country-specific factors; such an approach is useful in this study as a pool of OECD and EME countries which are expected to show differences is investigated.

Empirical results

Results of the panel unit root tests

Before proceeding to the details of the regression results, the results of the panel unit root tests are presented. The concern is that most macro data are non-stationary, therefore any model not allowing for data stationarity is very likely to yield spurious results, as there is a false strong correlation between the independent and dependent variables. Three different panel unit root tests are used, one by Levin, Lin and Chu (2002) (hereafter LLC), one by Im, Pesaran and Shin (2003) (hereafter IPS), and one by Hadri (2000). The main reason for using a number of different tests is to check the results' robustness, as in Davis and Hu (2004) and Hu (2005). Both LLC and IPS tests are an extended version of the time series' Augmented

Dickey-Fuller test (ADF) in the context of panel data, and their null hypothesis is non-stationarity, while the null hypothesis of Hadri (2000) is stationarity.

Results are presented in Table 2. Three variables were identified as stationary: the volatility indicator L(VOL), the inflation rate LINFL and the real interest rate L(INT-INFL). As regards other variables, on balance, they are all I(1) variables, *i.e.* become stationary after first differencing. As noted above, I(0) variables are not necessarily to be used to calculate the ECM term.

Results of the panel error correction model estimations

Table 3 shows the estimates of the log of real equity price volatility. For the ALL regression, the coefficients of both DLPFAGDP and PFAGDP(−1) are statistically positive, which implies that pension fund asset growth leads to stock market volatility.⁵ The finding is in line with some results obtained by using micro-data as reviewed in the previous section, as in Sias (1996). In addition, it is consistent with Dennis and Strickland's (2002) findings that institutional trading by pension funds moves in the same direction as markets, with the implication of causing market volatility. For the GDPGR term, both coefficients are negative, which indicates a negative link between GDPGR and VOL. This may be due to increased consumer confidence about the future when economic growth speeds up (Choudhry, 2003).

As regards the separate regression for OECD countries, the results do not change in a material way. For example, the coefficient of DLPFAGDP is 1.105, while that of LPFAGDP(−1) is 0.635. There are however, some counter-intuitive results

Table 3. Panel estimates for log of real price volatility (VOL)

Variable	All	OECD	EMEs
DLPFAGDP	1.029*	1.105*	−1.534***
DLINT	−0.050	−0.039	1.342*
DLINFL	−0.270*	−0.241*	0.074
DLGDPGR	−0.264*	−0.315*	0.352
DLCONGR	0.155***	0.241*	0.250
LPFAGDP(−1)	0.661*	0.635*	1.153**
LINT(−1)	−0.053	−0.126	1.249*
LINFL(−1)	−0.334*	−0.395*	0.101
LGDPGR(−1)	−0.281**	−0.339*	0.058
LCONGR(−1)	0.319*	0.428*	0.105
RSQ-bar	1.000	1.000	0.999
SE	0.825	0.850	0.469
OBS	273	236	37
No.	22	16	6

Notes: See Table 1. D: first difference. L: log. All: all countries including both OECD countries and EMEs. OECD: OECD countries. EMEs: emerging market economies. RSQ-bar: adjusted R squared. SE: stand error. OBS: number of observations. No. number of countries. *, 1%. **, 5%, ***, 10%.

Source: Author's calculations.

like the negative INFL term which might be due to the fact that real equity price volatility was used rather than market volatility in nominal terms. Regarding the CONGR variable, both its short-run and long-run coefficients are positive, indicating that the higher consumption expenditure, the more volatile the market. This might be because the more money invested in the stock market through consumer spending, the more it might destabilise the market. This is partly in line with findings in Carmichael and Samson (2005). They found evidence that consumption growth is a potential risk factor in explaining asset returns.⁴

Meanwhile, finding a positive link between pension fund assets and volatility supports the results of Davis (2004), *i.e.* not only the increasing share of equity in life insurance and pension fund portfolios but also pension fund assets per se contribute to equity price volatility in OECD countries. The reason why a similar result is achieved, despite two slightly different pension indicators being used, may be due to the important role played by equities in pension fund portfolios. For example, the latest statistics from Pension Funds and Their Advisors (2005) indicate that the UK largest 100 pension funds allocated around 60 per cent of their assets to equities (Clark and Hu, 2005). In addition, at the national level, an increasing share of equity in pension fund portfolios over time is found across a number of OECD countries and EMEs (Hu 2005).

When it comes to the EMEs regression, in the short run, pension asset growth is negatively correlated with volatility, while the correlation is positive in the long run. This is interesting as it indicates the dynamic structure of pension fund effects. It is notable that Walker and Lefort (2002) found pension funds reduce market volatility, despite using four different pension indicators. In addition, the INT term coefficients are positive, which is consistent with the review earlier indicating a positive link between macro-instability and volatility.

Table 4 presents the results of pension fund impacts on equity prices. First, PFAGDP terms are frequently positive across different regressions, which supports the hypothesis that equity prices are higher with a higher level of pension fund assets. Meanwhile, the positive effects are higher in EMEs than in OECD countries. For example, in the short run, a one per cent increase in LPFAGDP leads to around one per cent increase in equity prices in real value for EMEs, while the figure is 0.4 for OECD countries. One contributing factor to this discrepancy might be the small size of stock markets in emerging markets, thereby making it easier for institutions to influence asset prices.

ECM terms are consistently negative and statistically significant, thus indicating the co-integration relationship between the variables. In addition, inflation rates LINFL enter negative as in the EQP_*Real* regressions in line with the arguments in Schwert (1981). Coefficients of LINT in the EQP_*Nominal* regressions are negative but not significant, which could be explained by the use of the EQP in

Table 4. Panel error correction estimates for log-difference of equity prices (EQP)

Variable	EQP_Real			EQP_Nominal		
	All	OECD	EMEs	All	OECD	EMEs
DLFAGDP	0.293*	0.414*	1.008*	0.252*	0.439*	1.008*
LINFL	-1.018*	-1.016*	-1.015*	-0.023	-0.019	-0.015
LINT	-0.042***	-0.034	0.041	-0.042***	-0.032	0.041
DLGDPGR	0.029***	0.027	0.249**	0.029***	0.026***	0.249**
DLPOP65	-3.281***	-2.330	-22.727***	-3.750***	-2.689	-22.727***
DLPOP40	6.815**	6.759***	59.404*	9.969*	10.264*	59.404*
ECM (-1)	-0.143*	-0.113*	-0.659*	-0.144*	-0.117*	-0.659*
LPFAGDP (-1)	0.126*	0.031	0.458**	0.133*	0.033	0.633**
LINFL (-1)	0.828*	0.861*	0.235	-0.034	-0.029	-0.106
LINT (-1)	0.029	0.026	0.000	0.022	0.017	0.000
LGDPGR (-1)	-0.028	-0.014	0.142	-0.015	-0.005	0.211
LPOP65 (-1)	-0.817*	-0.416	-6.006*	-0.683*	-0.346	-4.855*
LPOP40 (-1)	-1.592*	-1.086*	-4.554**	-0.946*	-0.544**	-1.144
RSQ-bar	1.000	1.000	0.946	1.000	1.000	0.514
SE	0.217	0.191	0.252	0.216	0.187	0.252
OBS	298	243	55	316	261	55
No.	23	15	8	24	16	8

Notes: Key: see Table 1. D: first difference. L: log. All: all countries including both OECD countries and EMEs. OECD: OECD countries. EMEs: emerging market economies. RSQ-bar: adjusted R squared. SE: stand error. OBS: number of observations. No. number of countries. *, 1%. **, 5%, ***, 10%.

Source: Author's calculations.

nominal terms. DLGDPGR terms are positive in five out of six regressions. This result is self-explanatory in that higher economic growth provides more resources in both the goods and capital markets, which then boosts equity prices. Madsen and Davis (2003) arrived at similar results suggesting that productivity growth in industrial countries gives rises to temporary equity price increases.

Turning to the demographic variables, the coefficients of DLPOP65 are negative for ALL and EMEs regressions, while those for DLPOP40 are all positive, which is consistent with the empirical findings in Davis and Li (2003). The reasoning is that the population aged 40-65 are at their prime earning years, therefore they are willing to invest in markets. In consequence, equity prices go up. The effects are the opposite for the 65+ cohort as shown by the coefficients of DLPOP65. However, when the long-run effects are considered, the 40-65 cohort shows a negative sign, although there is still a relatively strong positive effect from the 65+ cohort.

The panel results of corporate bond yields are given in Table 5.⁶ Concerning the impacts of pension assets, it appears that it is negative in the short run. For example, in the CBY_Real_ALL regression, the coefficient of LPFAGDP(-1) is -0.264. This implies that when pension assets increase by one per cent, real corporate bond yields decline by around 0.3 per cent in the long run. The underlying reason might be that higher inflation rates erode real bond yields. It is notable

Table 5. Panel error correction estimates for log-difference of corporate bond yields (CBY)

Variable	CBY_Real			CBY_Nominal		
	All	OECD	EMEs	All	OECD	EMEs
DLPFAGDP	-0.205	-0.109	-1.737***	-0.063	-0.107	-1.618**
LINFL	-0.150*	-0.167*	-0.187	-0.008	-0.042	-0.020
LINT	0.310*	0.215	0.002	0.131**	0.087	-0.508
DLGDPGR	-0.142*	-0.119	-0.338**	0.010	0.046	-0.061
DLPOP65	-35.949*	-37.066*	79.203	-29.480*	-26.369*	57.151
DLPOP40	-22.674**	-23.015**	8.954	-11.682	-13.210	-19.821
ECM (-1)	-1.060*	-1.054*	-1.475*	-0.920*	-0.954*	0.069
LPFAGDP (-1)	-0.264**	-0.263**	0.461	-0.171***	-0.190***	-0.940***
LINFL (-1)	0.054	0.031	-0.112	0.139*	0.142***	0.092
LINT (-1)	-0.076	0.061	-0.068	0.182*	0.244**	-0.450***
LGDPGR (-1)	-0.139***	-0.140	-0.428***	0.018	-0.040	-0.062
LPOP65 (-1)	-0.838	-0.811	-38.946	-0.023	-0.098	11.307
LPOP40 (-1)	2.954**	2.778**	38.612	1.614***	2.004**	-19.622
RSQ-bar	1.000	0.811	1.000	0.683	0.516	0.703
SE	0.538	0.567	0.131	0.513	0.551	0.177
OBS	147	126	21	166	142	24
No.	17	11	6	17	11	6

Notes: Key: see Table 1. D: first difference. L: log. All: all countries including both OECD countries and EMEs. OECD: OECD countries. EMEs: emerging market economies. RSQ-bar: adjusted R squared. SE: stand error. OBS: number of observations. No. number of countries. *, 1%, **, 5%, ***, 10%.

Source: Author's calculations.

that the coefficients of LINFL in three CBY_Nominal regressions are not statistically significant. Meanwhile, three coefficients of LINFL(-1) in CBY_Nominal regressions are positive, of which two are significant. This means corporate yields have to increase in nominal value in order to compensate for higher inflation. Real interest rates (INT) are positive in four out of 12 regressions, which indicates a positive relationship between interest rates and bond yields.

Demographic variables give mixed results. In the CBY_Real regressions, the coefficients of DLPOP40 are negative and significant in line with empirical work by Davis and Li (2003) and Poterba (2001). This negative effect might signal the importance of governmental intervention, for example, via issuance of long-term indexed bonds (Schich and Weth, 2006). However, in the long run, our results show that the impacts are positive, as indicated by the coefficients of LPOP40(-1). This reversal of effects might reflect the arguments against the classic life-cycle theory, *i.e.* the automatic adjustment of asset prices in the financial markets given the predictability of demographic ageing, and the bequest motive from older people (Schich, 2004).

The last estimates in the study relate to government bond yields. The results are given in Table 6. ECM terms are negative and statistically significant, implying a co-integration relationship between the variables. Meanwhile, pension asset terms frequently show negative coefficients, which might be partly due to the way governments finance their pension debts (Holzmann *et al.*, 2004). In other words, if a country is moving from a pay-as-you-go system to a funded system, implicit pension debts become explicit and have to be financed somehow. One way to finance them is by issuing government bonds. In this context, governments, in many cases, force accumulated pension funds to buy these newly issued government bonds, *e.g.* through investment legislation. Similar to those in Table 5, the results regarding demographic variables are mixed, leaving some questions on this topical issue open.

Table 6. **Panel error correction estimates for log-difference of government bond yields (GBY)**

Variable	GBY_Real			GBY_Nominal		
	All	OECD	EMEs	All	OECD	EMEs
DLFAGDP	-0.215***	-0.268**	-0.713	-0.154**	-0.178*	-0.345***
LINFL	-0.123*	-0.144*	-0.276	0.091*	0.084*	0.245*
LINT	0.428*	0.451*	0.080	0.053*	0.058*	0.023
DLGDPGR	0.007	0.006	-0.169***	0.003	0.007	-0.081
DLPOP65	-1.862	1.233	-93.259*	1.261	2.443	-21.66***
DLPOP40	-3.885	-3.007	-14.701	-1.938	-1.032	-8.666
ECM(-1)	-0.450*	-0.435*	-0.704*	-0.359*	-0.350*	-0.937*
LPFAGDP (-1)	-0.251*	-0.290*	-0.766***	-0.037	-0.058***	-0.147
LINFL (-1)	0.083*	0.084*	0.089	0.000	0.005	-0.032
LINT (-1)	-0.097**	-0.105***	0.181	0.002	0.000	0.017
LGDPGR (-1)	-0.034	-0.036	0.544*	0.029**	0.032**	0.111
LPOP65 (-1)	-0.149	-0.125	-1.273	-0.113	-0.067	-1.325**
LPOP40 (-1)	0.464	0.767***	7.174*	0.457*	0.565*	3.626*
RSQ-bar	1.000	1.000	0.797	1.000	1.000	0.555
SE	0.355	0.310	0.313	0.301	0.187	0.257
OBS	295	251	44	315	270	45
No.	23	17	6	23	17	6

Notes: Key: see Table 1. D: first difference. L: log. All: all countries including both OECD countries and EMEs. OECD: OECD countries. EMEs: emerging market economies. RSQ-bar: adjusted R squared. SE: stand error. OBS: number of observations. No. number of countries. *, 1%, **, 5%, ***, 10%.

Source: Author's calculations.

IV. Conclusions

The pensions industry has witnessed significant expansion during recent decades, and this trend is very likely to continue in the foreseeable future (Davis, 2003; OECD, 2006). Given the size of pension funds relative to the whole economy (Hu, 2005), one interesting question is to what extent pension assets have an impact on financial markets. This paper contributes to the current literature by looking at the

macro effects of pension fund assets on financial markets, *i.e.* volatility, equity prices and bond yields, across 24 countries.

As regards the results with respect to market volatility, the model suggests that pension funds in both OECD countries and EMEs increase market volatility. This supports Davis' (2004) results in that not only does the equity share of pension funds contribute to market volatility, but so do pension funds *per se*. As far as equity prices are concerned, it was found that pension asset growth leads to higher equity prices. The results are statistically significant and consistent across the groups of countries. Finally, regarding the link between pension funds and bond yields, a negative relationship for both corporate and government bonds was found. This gives evidence of downward pressures on fixed-income prices imposed by the growth of pension assets.

Despite the findings presented in this paper, there are still some caveats which justify further work in the future. First, statistical robustness could be improved by using more data, which is especially relevant to the regressions on EMEs. Secondly, it could be possible to employ some other econometric techniques, *e.g.* Generalised Method of Moments (GMM) to better address the issue of serial correlation and endogeneity.

Notes

1. Aggregate quarterly institutional ownership data in the United States are accessible through the CDA/Spectrum institutional (13f) holding database, which provides common stock holdings and transactions for institutions at quarterly intervals. Five different institutions are identified, *i.e.* banks, insurance companies, investment companies (mutual funds), investment advisors and others.
2. It should be noted, however, that mutual funds' trading with the momentum of the market could be decomposed into two factors: one is the mutual fund managers who buy or sell funds at their discretion during up or down days; the other is the individual investors, *i.e.* the owners of the funds who ask fund managers to act on their behalf. Therefore, institutional investors' herding behaviour in terms of mutual funds is complicated and entangled in the behaviour of individual investors, thus it is not sensible to attribute market volatility, if any, to only mutual fund managers in this context.
3. In Lakonishok *et al.* (1992), the measure of herding is specified as $H = |B/(B+S) - p| \cdot AF$. B/S is the number of fund managers who increase/decrease their holdings in stock in the quarter (net buyers/net sellers), p is the expected proportion of fund managers buying in that quarter relative to the number of managers active in trading. AF is the adjustment factor, which is the expected value of $|B/(B+S) - p|$ under the null hypothesis of no herding. Based on the definition of this herding statistic, the closer it is to the value of zero, the less likely it is that fund managers are herding.
4. As explained earlier, if consumption growth is one determinant of asset returns, then consumption will cause asset returns to be auto-correlated over time, which can lead to market volatility.
5. The high value of R squared of the results presented in Tables 3 to 6 may be due to serial correlation, an issue to be addressed in future research.
6. It is worth noting that regressions for EMEs have the problem of small observations, one with 21 and the other with 24, therefore, the results for these two regressions should be taken for reference only.

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Résumé : L'impact des fonds de pension sur les marchés de capitaux

Cet article procède à une exploration empirique de l'impact des fonds de pension sur la volatilité des marchés, les cours des actions, les rendements des obligations d'État et de sociétés dans le cas d'un panel de 24 pays. Les résultats de cette étude font apparaître une relation positive et statistiquement significative entre volatilité des marchés et actifs de retraite. Ils viennent compléter des éléments microéconomiques (Dennis et Strickland, 2002) ainsi que des observations macroéconomiques (Davis, 2004). En outre, on constate une corrélation positive des cours des actions avec les fonds de pension, observation s'appliquant à la fois aux pays de l'OCDE et aux économies de marché émergentes (EME) et valable aussi bien pour le court terme que le long terme. Par ailleurs, des éléments indiquent une relation négative entre actifs des fonds de pension et rendements des obligations d'État comme de sociétés. Cela peut s'expliquer par les effets considérables des achats des fonds de pension, notamment lorsque les pouvoirs publics ont tendance à utiliser les fonds de pension pour financer des engagements implicites de retraite au moment où les régimes traditionnels de répartition passent à la capitalisation.

Abstract: OECD Guidelines on Pension Fund Asset Management

The OECD Guidelines on Pension Fund Asset Management set out a basic framework for the regulation of pension fund investment. The Guidelines start with the basic premise that the regulatory framework should take into account the retirement income objective of a pension fund. Two other essential aspects of the regulatory framework are the prudent person standard and the statement of investment policy. Regulations may also include quantitative limits, but only as long as they are consistent with and promote the prudential principles of security, profitability and liquidity pursuant to which assets should be invested.

These Guidelines were developed by the Working Party on Private Pensions and the Insurance and Private Pensions Committee and were adopted by the OECD Council on 26 January 2006. They complement the "Recommendation of the Council on Core Principles of Occupational Pension Regulation", adopted by the OECD Council in July 2004.

OECD Guidelines on Pension Fund Asset Management*

I. Introduction

Pension funds are one of the most important players in the financial markets of the OECD countries, managing more than USD15 trillion of assets in 2003, which represents over 80 per cent of the OECD's area GDP. Pension funds also play a key social role in channelling retirement contributions to finance retirement benefits. The investment of pension assets is one of the core functions performed by private pension arrangements. In order to promote both the performance and the financial security of pension plan benefits, it is critical that this function is implemented and managed responsibly. Policymakers have therefore a key role to ensure that regulations encourage prudent management of pension fund assets so as to meet the retirement income objectives of the pension plan.

The investment function varies depending on the type of pension plan. In the case of defined benefit plans, the goal of the investment function is to generate the highest possible returns consistent with the liabilities and liquidity needs of the pension plan, and in light of the risk tolerances of affected parties. In a defined contribution plan, the main goal of the investment function is to generate gains that accrue to individual member account balances in light of her investment goals.

The OECD Guidelines on Pension Fund Asset Management set out a basic framework for the regulation of pension fund investment, where regulation is defined in a broad sense that may include: the main body of the pension law; related laws (*e.g.* trust law); tax requirements; standards set by pension and financial sector supervisory authorities; codes of conduct developed by professional associations (*e.g.* a pension fund association); collectively bargained agreements; or plan documents (*e.g.* trust documents).

* These guidelines, prepared by the OECD Insurance and Private Pensions Committee and Working Party on Private Pensions, were adopted by the OECD Council as a Recommendation on 26 January 2006. They complement other OECD guidelines covering private pension regulatory issues, all of which are available at www.oecd.org/daf/pensions.

The Guidelines start with the basic premise that the regulatory framework should take into account the retirement income objective of a pension fund. Two other essential aspects of the regulatory framework are the prudent person standard and the statement of investment policy. Regulations may also include quantitative limits, but only as long as they are consistent with and promote the prudential principles of security, profitability and liquidity pursuant to which assets should be invested. Minimum levels of investment on certain assets, for example, would not be considered consistent with these principles. On the other hand, limits on investment in assets belonging to the plan sponsor are recommended by the OECD Guidelines.

The Guidelines on Pension Fund Asset Management, which are contained in Section III, address regulatory concerns that arise in the management of pension fund assets. The Guidelines aim to guide policymakers, regulators, supervisors and other entities involved in pension fund administration and management, particularly pension fund asset management. They are non-binding and aim to present good practices. As noted in various annotations to the Guidelines, their precise manner of implementation may vary from country to country, the aim being that the underlying objectives of each Guideline are met.

These Guidelines apply to the regulation of the individuals or entities responsible for managing the pension fund assets, typically the governing body of the pension fund, but also the asset management companies associated with them. Like previously developed principles and guidelines, these guidelines are intended to apply to occupational, private pension plans, that is, to those whose membership depends on an employment relationship – regardless of whether the plans are voluntary or mandatory (on the part of employers or employees) and regardless of whether the plans serve as the primary or supplementary means of providing retirement income. Non-occupational plans and funds are not specifically addressed by these guidelines. Nonetheless, given the nature of the particular topic addressed – pension fund asset management – most of the guidance may be also applied to non-occupational pension programmes that are supported by privately managed pension funds. Similarly, administrators of government worker's pension programmes, to the extent funded, may also find these guidelines valuable.

These Guidelines were developed by the Working Party on Private Pensions and the Insurance and Private Pensions Committee. They complement the “Recommendation of the Council on Core Principles of Occupational Pension Regulation”, adopted by the OECD Council in July 2004.

The annotations in Section IV explain the rationale for the Guidelines and provide additional information on certain issues. Annex II is not formally part of

the draft Recommendation and may be updated or amended as necessary by the Insurance and Private Pensions Committee.

II. Recommendation on Guidelines on Pension Fund Asset Management

THE COUNCIL,

Having regard to Articles 1, 3 and 5(b) of the Convention on the Organisation for Economic Cooperation and Development of 14 December 1960;

Having regard to the Recommendation of the Council on Core Principles of Occupational Pension Regulation, to which this Recommendation is complementary;

Considering that the investment of pension funds is a central function of private pension arrangements;

Considering that regulations should encourage prudent management of pension fund assets so as to meet the retirement income objectives of the pension plan;

Considering that the Guidelines presented in Annex I are based on previous work carried out in this area by the Insurance and Private Pensions Committee and its Working Party on Private Pensions;

Considering that the Guidelines address regulatory concerns that arise in pension fund asset management;

Noting that these Guidelines are intended to apply to occupational, private pension plans and the pension funds and asset management companies associated with them;

Noting that these Guidelines may also apply to funded, non-occupational plans and funds;

Noting that the Guidelines identify good practices for the regulation of pension funds, where “regulation” is understood to include a broad variety of instruments, *e.g.* laws; tax requirements; standards set by supervisory authorities; codes of conduct developed by professional associations; collectively bargained agreements and plan documents;

Recognising that evolutions of the pension funds structure or functioning may call for further updating and adaptation of these Guidelines;

On the proposal of the Insurance and Private Pensions Committee and its Working Party on Private Pensions;

I. RECOMMENDS that Member Countries invite public authorities to ensure an adequate regulation of pension fund asset management, having regard to the contents of Annex I to this Recommendation, of which it forms an integral part.

II. INVITES Member Countries to disseminate these Guidelines among pension funds, noting also the annotations provided in Annex II, as from time to time amended.

III. INVITES non-Members to take account of the terms of this Recommendation and, if appropriate, to adhere to it under conditions to be determined by the Insurance and Private Pensions Committee.

IV. INSTRUCTS the Insurance and Private Pensions Committee and its Working Party on Private Pensions to exchange information on progress and experiences with respect to the implementation of this Recommendation, to review that information and to report to the Council not later than three years following its adoption and, as appropriate, thereafter.

III. Guidelines on Pension Fund Asset Management

Guideline 1: Retirement income objective and prudential principles

The regulation of pension fund asset management should be based on the basic retirement income objective of a pension fund and assure that the investment management function is undertaken in accordance with the prudential principles of security, profitability, and liquidity using risk management concepts such as diversification and asset-liability matching.

Guideline 2: Prudent person standard

The governing body of the pension plan or fund and other appropriate parties should be subject to a “prudent person standard” such that the investment of pension assets is undertaken with care, the skill of an expert, prudence and due diligence. Where they lack sufficient expertise to make fully informed decisions and fulfil their responsibilities the governing body and other appropriate parties should be required to seek the external assistance of an expert.

The governing body of the pension plan or fund and other appropriate parties should be subject to a fiduciary duty to the pension plan or fund and its members and beneficiaries. This duty requires the governing body and other appropriate parties to act in the best interest of plan members and beneficiaries in matters regarding the investment of pension plan assets and to exercise “due diligence” in the investment process.

The legal provisions¹ should require the governing body of the pension plan or fund to establish a rigorous process by which investment activities are carried out (see Guideline 3 on investment policy), including the establishment of appropriate internal controls and procedures to effectively implement and monitor the investment management process.

Guideline 3: Investment policy

The governing body of the pension fund should set forth in a written statement and actively observe an overall investment policy.

The investment policy should establish clear investment objectives for the pension fund that are consistent with the retirement income objective of the pension fund and, therefore, with the characteristics of the liabilities of the pension fund and with the acceptable degree of risk for the pension fund, the plan sponsor and the plan members and beneficiaries. The approach for achieving those objectives should satisfy the prudent person standard taking into account the need for proper diversification and risk management, the maturity of the obligations and the liquidity needs of the pension fund, and any specific legal limitations on portfolio allocation.

The investment policy should at a minimum identify the strategic asset allocation strategy for the pension fund (the long-term asset mix over the main investment categories), the overall performance objectives for the pension fund, and the means of monitoring and, when necessary, modifying allocations and performance objectives in the light of changing liabilities and market conditions. The investment policy should also include any broad decisions regarding tactical asset allocation, security selection and trade execution.

A sound risk management process that measures and seeks to appropriately control portfolio risk and to manage the assets and liabilities in a coherent and integrated manner should be established.

The investment policy for pension programmes in which members make investment choices should ensure that an appropriate array of investment options, including a default option, are provided for members and that members have access to the information necessary to make investment decisions. In particular, the investment policy should classify the investment options according to the investment risk that members bear.

Parties who are responsible for the overall implementation of the investment policy should be identified together with any other significant parties that will be part of the investment management process. In particular, the investment policy should address whether internal or external investment managers will be used, the range of their activities and authority, and the process by which they will be

selected and their performance monitored. An investment management agreement should be required if external investment managers are used.

There should be procedures and criteria by which the governing body or other responsible party periodically reviews the effectiveness of their investment policy and determines whether there is a need to change the policy, its implementation procedures, the decision-making structure, as well as the responsibilities linked to its design, implementation, and review.

Guideline 4: Portfolio limits

The legal provisions may include maximum levels of investment by category (ceilings) to the extent that they are consistent with and promote the prudential principles of security, profitability, and liquidity pursuant to which assets should be invested. Legal provisions could also similarly include a list of admitted or recommended assets. Within this framework, certain categories of investments may be strictly limited. The legal provisions should not prescribe a minimum level of investment (floors) for any given category of investment, except on an exceptional and temporary basis and for compelling prudential reasons.

Portfolio limits that inhibit adequate diversification or impede the use of asset-liability matching or other widely-accepted risk management techniques and methodologies should be avoided. The matching of the characteristics of assets and liabilities (like maturity, duration, currencies, etc.) is highly beneficial and should not be impeded.

Where the legal provisions establish maximum levels of investment by category (ceilings), there should be an established procedure for correcting excesses within specified time limits.

Self-investment by those undertaking investment management of pension funds should be prohibited or limited, unless appropriate safeguards exist. Investment in assets of the plan sponsor, in parties related or affiliated with any pension entity or pension fund managing company is prohibited or strictly limited to a prudent level (*e.g.* 5 per cent of the pension fund assets). When the plan sponsor, the pension entity or the pension fund managing company belong to a group, investment in undertakings belonging to these same groups should also be limited to a prudent level, which may be a slightly higher percentage (*e.g.* 10 per cent of the pension fund assets).

Investments in assets issued by the same issuer or by issuers belonging to the same group should not expose the pension fund to excessive risk concentration.

Investment abroad by pension funds should not be prohibited and, among other risks, should take into account the currency matching needs between pension plans assets and liabilities.²

Legal provisions should address the use of derivatives and other similar commitments, taking into account both their utility and the risks of their inappropriate use. The use of derivatives that involves the possibility of unlimited commitments should be strictly limited, if not prohibited.

All legal provisions setting forth quantitative portfolio limits should be regularly assessed to determine whether they are unnecessarily inhibiting the ability of pension fund asset managers to implement optimum investment strategies and amended to the extent necessary.

Guideline 5: Valuation of pension assets

The legal provisions should establish a proper, transparent and disclosed basis for valuing pension assets.

Where national rules do not require valuation at current market value or under a fair valuation methodology, it is recommended that the valuation be accompanied by the disclosure of the results that would have been obtained using a current market value or fair valuation methodology.

The legal provisions should require pension assets to be valued for accounting, reporting, actuarial and funding purposes. Ideally, permitted valuation methodologies for these purposes should be consistent, and where inconsistent, the differences in methodologies should be transparent. In appropriate circumstances, rules may permit methods that reduce short-term volatility of values over time for actuarial and funding purposes.

Special methods may be needed to value securities in less liquid markets and assets such as real estate. The legal provisions may set out specific methodologies for valuing such assets which should, as far as possible, take into account the risk inherent to illiquid markets.

The methodology used for valuing pension fund assets should be transparent to the pension fund's governing body, all others involved in the investment management process for the pension fund, and members and beneficiaries.

IV. Annotations to Guidelines on Pension Fund Asset Management

Guideline 1: Retirement income objective and prudential principles

The regulation of pension fund asset management should be based on the basic objective of a pension fund which is to serve as a secure source of retire-

ment income. The regulation should identify a set of prudential principles, including security, profitability (performance), and liquidity of the portfolio as a whole using risk management concepts such as diversification and asset-liability matching. As explained in greater detail below (Guidelines 2 and 4), the basic regulations take the form of prudent person standards and, in certain cases, portfolio limits.

Guideline 2: Prudent person standard

Under a prudent person standard, the pension fund's governing body or another responsible party is given broad authority to invest the pension assets in a prudent fashion in light of the particular needs of the plan or fund. Under this standard, a governing body is expected to undertake obligations related to the investment management function with the requisite level of skill to effectively carry out that function, and absent that level of skill or knowledge, to obtain the external assistance of an expert in the particular matter in which the governing body is deficiently skilled or lacking in knowledge, as suggested in the pension fund governance guidelines approved by Council. The trend has been to require that prudent persons undertake their obligations with the skills and knowledge that an "expert" (rather than an "ordinary person") would bring to their required tasks. The "expert" standard should be applied in light of the sophisticated and complex issues that arise in the area of portfolio asset management.

The standard of prudent behaviour should include a fiduciary duty, *i.e.* an obligation to make investment management decisions in the best (sometimes expressed in the terms of the "sole" or "exclusive") interest of plan or fund members, and a duty to exercise "due diligence" in the investment process, *i.e.* an obligation to adequately research and monitor investments and those to whom the investment management function is delegated. The fiduciary duty often is accompanied by additional rules to avoid circumstances in which it may be challenged. For example, many countries prohibit pension fund governing bodies and those working for the governing body from entering into situations, relationships or transactions that would create (or give the appearance of creating) a conflict of interest that would undermine their ability to carry out their fiduciary duty to the pension fund and its members. Policymakers and regulators should give serious and due consideration to the promulgation of such rules in addition to establishing a fiduciary duty.³

It is also important that policymakers and regulators determine to whom the prudent person standard and the related fiduciary and due diligence duties should apply. At a minimum, these standards and duties should apply to the governing body of the pension fund and to other relevant parties, such as asset managers to whom discretionary investment responsibilities have been delegated.

The prudent person standard focuses on behaviour and process rather than on outcomes. It seeks to assure that those responsible for managing pension fund assets do so in a professional manner with the sole aim of benefiting the pension fund and its members. Because of its procedural focus, the prudent person standard places significant emphasis on the ability of pension fund governing bodies to hire qualified assistance and establish appropriate internal controls and procedures to effectively implement and monitor the investment management process.⁴ The establishment and use of a comprehensive investment policy (see section III) is considered a crucial aspect of satisfying the prudent person standard.

Portfolio limits (see Guideline 4) can serve to establish important boundaries that prevent or inhibit inappropriate or extreme investment management decisions, but they alone cannot effectively regulate the manner in which pension fund asset management decisions are made within those boundaries, and, in fact, are silent with respect to activity that is “within bounds.” Therefore, jurisdictions that rely solely on a series of quantitative portfolio limits to regulate pension fund asset management should consider establishing a prudent person standard to work in tandem with portfolio limits. In this regard, countries that rely primarily on portfolio limits should, at a minimum, also set forth prudent person standards for pension fund governing bodies.

Guideline 3: Investment policy

Parties responsible for managing the investment management of pension assets should establish an investment policy and describe it in a written statement. This should be required regardless of whether the investment regulations use the prudent person standard, portfolio limits or some combination of the two. An investment policy should be established regardless of plan type, whether defined benefit or defined contribution. As noted in the guidelines, pension programmes that include member direction may be required to address additional or different issues in their investment policies.⁵

Similarly, the investment policies of defined benefit plans may differ from those of defined contribution plans. In particular, the relationship between actuarial determinations, funding obligations and investment management is significantly more complex for defined benefit plans, and the relationship should be adequately considered in an investment policy.

The investment policy should establish clearly the financial objectives of the pension fund and the manner in which those objectives will be achieved. The investment objectives should be consistent with the retirement income objective of the pension funds, and therefore, with the fund's liabilities. They should also satisfy the relevant legal provisions (prudent person standard and portfolio limits),

and more generally, the principles of diversification, and matching of assets and liabilities (maturity, duration, currency, etc).

The investment policy should take into consideration the short and long term obligations of the pension fund, including any necessary funding and actuarial matters that may impact on those obligations. Short term obligations include the obligation to pay benefits to those in or who will enter pay status (retirement); salaries, administrative costs and fees that are to be paid by the pension plan from pension fund assets; and anticipated costs arising from portability provisions that might apply to the plan.

The investment policy should identify the strategic asset allocation (the long-term asset mix over the main investment categories), the overall performance objectives of the pension fund, and the means of monitoring and, when needed, modifying broad asset allocations and performance objectives in the light of changing liabilities and market conditions. More specifically, the policy statement should include appropriate performance benchmarks and assessment timeframes and address the extent to which deviations from the strategic asset allocation will be tolerated.

The implementation of a sound risk management process is essential to appropriately measuring and controlling portfolio risk and the overall risk profile of the pension fund, including the extent of matching between assets and liabilities. The governing body may establish a target level of asset-liability matching that can be monitored through appropriate risk management techniques that take into account the main risk factors influencing the assets and liabilities of the pension fund.

The investment policy should address whether internal or external investment managers will be used, the range of their activities and authority, and the process by which they will be selected and their performance monitored. Where delegation of the asset management function is envisaged, an investment management agreement should also be required. Similarly, the investment policy should consider the costs of investment management and related activities, including research and transaction costs and compensation, especially of external service providers.

Guideline 4: Portfolio limits

By setting forth portfolio limitations, regulators explicitly restrict the range of asset allocation strategies available to those charged with pension fund asset management responsibilities by establishing quantitative limits on investment, typically by asset class. Typically these limits are established as maximum permitted levels of investment (ceilings) in various asset categories and markets. The

general intent of such portfolio limits is to implement the prudential principles of security, profitability and liquidity at the regulatory level, rather than pension fund level, and to effect or make an initial strategic asset allocation decision applicable to all pension funds subject to the legal provision. Portfolio limits may be applied to ensure a minimum degree of diversification and asset-liability matching.

A list of admitted/recommended assets and markets could also be established (possibly at a broad level only). In some circumstances, such a list could be compulsory. It could also be optional, but in that case there should be the possibility to require the firm to justify any substantial deviation from the list.

Certain categories of investment may be strictly limited (as for instance loans without appropriate guarantee, unquoted shares, certain equities which may raise major risks of conflicts of interest, illiquid assets, and, in general, investments that lack sufficient transparency). It may also be relevant to set limits on investment by pension funds in companies (or investment vehicles) holding a large volume of such categories of assets.

Portfolio limits regulation may also be used in accordance with the principle of diversification to establish maximum levels of investment in a given asset, in a single issue, or in securities of the same issuer (single or group issuer) as a proportion of a pension fund's total portfolio. This is one of the most widely-used types of portfolio limits regulation and is often used in prudent person-oriented jurisdictions.

Portfolio limits that prohibit or significantly limit self-investment by those undertaking investment management of pension assets are also recommended. These limitations either may be set forth explicitly, or they may be incorporated within a prudent person approach to regulation. Where explicit limitations rather than outright prohibitions are set, the legal provisions should establish a prudent ceiling (*e.g.* no higher than 10 per cent of the pension assets) on the ability of pension fund managers to invest pension assets in shares or other financial instruments of their own company and affiliated companies. Similar limits should be placed on the ability to invest pension assets in the shares or other financial instruments of the employer sponsoring a pension plan or fund and affiliated companies of that employer. The specific limit should take into account the risks that come with the investment in the sponsoring company. In the case of a single sponsor, investment in sponsor assets should be limited to a prudent level (*e.g.* 5 per cent of the pension fund assets). When the sponsor belongs to a group the total investment in companies that are part of this group may be limited to a slightly higher percentage (*e.g.* 10 per cent of the pension fund assets). Similarly, legal provisions should include maximum limits on the investment of pension assets in parties related to or affiliated with any of the service providers of a pension plan, in order to address conflict of interest concerns. (As noted in the discussion

of the prudent person standard, legal provisions addressing conflicts of interest situations are often used in conjunction with – or in lieu of – an explicitly stated fiduciary duty.)

For member-directed occupational pension plans, the principle of diversification and rules prohibiting or limiting self-investment may be important aspects of pension fund investment regulation, and regulators should assess whether their regulation of such pension programmes adequately addresses these issues in member-directed pension fund accounts. These concerns can be reviewed and addressed at two levels. First, the pension funds (or other pooled investment vehicles) in which members are permitted to invest can be regulated to prevent the portfolios from inappropriate self-investing or investing in a manner that would violate the principle of diversification. Second, additional rules could be placed on members to whom investment choice is available.

Where the legal provisions establish maximum levels (ceilings) of investment by category in accordance with the principle of diversification, there should be an established process by which pension funds are required to correct any excesses within specified time limits. Similarly, it may also be necessary to address temporary violations caused by unanticipated or unusual fluctuations in market valuations of pension fund portfolios. Policymakers and regulators should account for the fact that simultaneous decreases in the value of one asset category and increases in the value of another may have substantial implications on portfolio allocations that are tested against portfolio limits on a percentage of portfolio basis.

Certain types of portfolio limitations should generally be avoided. In contrast to the establishment of maximum levels of investment levels, the establishment of minimum levels of investment (floors) for a given category of investment should be prohibited. “Floors” force pension funds to invest specified portions of their portfolios in particular asset categories, leaving pension fund asset managers no or little ability to walk away from what they might determine to be unwise investments or investments inappropriate for their portfolios. “Floors” might also artificially inflate prices in particular asset classifications. As stated in the guideline, legal provisions should not prescribe a minimum level of investment for any given category of investment, except on an exceptional and temporary basis and for compelling prudential reasons. Investment floors have also been used when a new private pension system starts functioning and it is felt that only certain financial assets offer sufficient transparency or liquidity. In such cases, it is usually preferable to impose ceilings on those assets not considered apt for investment.

Quantitative portfolio limitations that inhibit adequate diversification or impede matching of the characteristics of assets and liabilities (maturity, duration, currencies, etc.) should be avoided. In this regard, policymakers and regulators

should take account of and give proper consideration to modern and effective risk management methods, including the development of assets/liabilities management techniques. Application of these techniques may result in portfolios that are heavily weighted in bonds, for example, and, which, as a result, could violate portfolio limit regulatory regimes, and yet not necessarily be regarded as inadequately diversified or imprudent. It is important that the regulation of investment portfolios take into account the portfolio of commitments and obligations of pension funds, and legal provisions should, therefore, set out a framework of general principles that adequately addresses the matching and similar risk management techniques. In this regard, it may be useful to tailor regulations to the nature of contractual guarantees (with regard, for example, to returns, interest rates, indexation, etc.), maturities, and payout terms (*e.g.*, annuities or lump sums) of the particular pension programme.

Prohibitions on investments abroad can undermine the key goals of portfolio limits regulation – to assure appropriately diversified pension fund portfolios – and should be avoided. These limitations may also undermine the profitability objective. To the extent that national markets are not correlated, the ability to diversify investment internationally should reduce risk. Additionally, in some countries domestic markets may be inadequately diversified, for example by being dominated by a small number of large firms or unduly exposed to one type of industry. (The benefits of international portfolio diversification for pension funds, however, might need to be weighed against other policy considerations. For instance, in many countries pension funds are a significant component of national savings and play an important role in the development of domestic markets.) When investing in foreign assets, political and currency risks should be duly considered and adequately addressed. Countries may also consider rules addressing currency risks and the location of the title to foreign assets or of the pension trust.

Derivatives are complex financial instruments that have an increasing place in pension fund portfolios. The use of derivatives as a management instrument may prove useful and effective if done in a prudent fashion in order to reduce investment risks or facilitate efficient portfolio management. Specific rules may need to be established in order to ensure that their use is consistent with appropriate risk-management systems. The use of derivatives that involves the possibility of unlimited commitments and, more generally, the use of derivatives for speculative purposes should be prohibited.

Policymakers and regulators maintaining portfolio limits should regularly assess whether or not their legal provisions are creating adverse incentives that might be undermining or unnecessarily inhibiting the ability of pension fund asset managers to implement optimum investment strategies. Amendments to such legal provisions should be made if it is found that they are unnecessarily con-

straining. To the extent that the security of pension fund assets is not put at risk, they should also consider making quantitative portfolio limits less restrictive and increasing reliance on a prudent person standard. As noted in the discussion of the prudent person standard, although the prudent person rule and portfolio limits are sometimes viewed as competing forms of regulation, they can work as effective complements to one another – and policymakers and regulators should strive to obtain the appropriate balance.

Guideline 5: Valuation of pension assets

In order for pension fund assets to be appropriately managed, the pension fund's governing body and other parties involved in pension fund asset management must be able to readily ascertain the value of the pension assets for which they are responsible, regardless of the nature of the investments held in the pension fund. In general, current market values should be used where available. If not available, a fair valuation methodology acceptable under general accounting standards should be used. Where alternative methodologies are used, it is recommended that the use of such methods be accompanied by the disclosure of the results that would have been obtained using a current market value or fair valuation methodology.

In all cases the methodology used for valuing pension fund assets should be transparent to the pension fund's governing body and those involved in the investment management process for the pension fund. Valuations and methods used should be readily available or disclosed to members and beneficiaries.

Some jurisdictions permit the use of various methods of smoothing asset values over time in the context of actuarial and funding determinations for defined benefit pension plans and defined contribution plans with guarantees. Where smoothing is employed, regulators and supervisors should seek to assure that it does not mask significant underlying concerns regarding the overall asset allocation of a pension fund portfolio or the performance of any specific investments or asset classification. Because smoothing techniques may have a significant impact on actuarial and funding determinations, regulators and supervisors that work in an environment where the smoothing of asset values is permitted should fully understand the nature of the potential impact. Smoothing of asset values may be unnecessary if funding obligations pertaining to experience and actuarial gains and losses can be spread over time.⁶

Notes

1. Throughout this document, legal provisions are defined in a broad sense. They may include the main body of the pension law, related laws (*e.g.* trust law), tax requirements, standards set by pension and financial sector supervisory authorities, codes of conduct developed by professional associations (*e.g.* a pension fund association), collectively bargained agreements, or plan documents (*e.g.* trust documents).
2. These limitations on investments abroad are identified in the document “OECD Code of Liberalisation of Capital Movements. Portfolio Investment Abroad by Insurance Companies and Private Pension Funds: Widened Application of the OECD Code of Liberalisation of Capital Movements and Related Amendments”.
3. Conflicts of interest are also addressed in the Recommendation of the Council on Guidelines for Pension Fund Governance.
4. Put otherwise, the prudent person standard requires robust operational and other governance structures. The reader is referred to the Recommendation of the Council on Guidelines for Pension Fund Governance.
5. For special considerations regarding member-directed accounts, see Core Principle 5 (Protection of Rights of Members and Beneficiaries in Occupational Pension Plans) in the Recommendation of the Council on Core Principles of Occupational Pension Regulation.
6. In EU countries, these Guidelines may not apply to those occupational, private pension plans which fall outside the scope of the directive 2003/41/EC of the European Parliament and of the Council of 3 June 2003 on the Activities and Supervision of Institutions for Occupational Retirement Provision.

Résumé : Lignes directrices de l'OCDE sur la gestion des actifs des fonds de pension

Les Lignes directrices de l'OCDE sur la gestion des actifs des fonds de pension proposent un cadre élémentaire de réglementation des placements des fonds de pension. Elles partent du principe que le cadre réglementaire doit tenir compte de l'objectif d'un fonds de pension, qui est de servir des retraites. Deux autres aspects essentiels du cadre réglementaire sont la norme de prudence et l'exposé de la politique d'investissement. La réglementation peut aussi prévoir des limites quantitatives, mais seulement si elles sont compatibles avec les principes prudentiels de sécurité, de rentabilité et de liquidité qui régissent l'investissement des actifs, et si elles en assurent l'application.

Ces Lignes directrices ont été élaborées par le Groupe de travail sur les pensions privées et le Comité des assurances et des pensions privées avant d'être adoptées par le Conseil de l'OCDE le 26 janvier 2006. Elles viennent compléter la « Recommandation du Conseil de l'OCDE sur les principes fondamentaux de réglementation des pensions professionnelles », adoptée par le Conseil de l'OCDE en juillet 2004.

Overview of the Financial Wealth Accumulated under Funded Pension Arrangements

In addition to private pension fund and life insurance assets, several countries have accumulated large amounts of pension assets in their national pension reserve funds. Pension reserve fund refers to assets set aside by otherwise pay-as-you-go systems in preparation for the rising fiscal costs resulting from the predicted ageing of the population over the next few decades.

The statistics in Figure 1 show that by 2005, the United States had accumulated a large amount of financial pension wealth – equivalent to more than 160 per cent of GDP – of which 45.3 per cent was accounted for by the pension reserve fund, 93.8 per cent by pension funds, and 22.8 per cent by life insurance assets. Other countries with solid pension and life insurance markets include Ireland, Norway, Denmark and Japan, where the total amount of pension wealth was over 100 per cent of GDP. By comparison, the ratio of total pension wealth to GDP was less than 40 per cent in three countries, namely Korea, Portugal, and New Zealand.

The OECD pension plan classification considers both funded pension plans that are workplace-based (occupational pension plans) or accessed directly in retail markets (personal plans). Both mandatory and voluntary arrangements are included. Because funded pension arrangements have developed heterogeneously across OECD countries, it is also important to be aware of the institutional differences between countries. Depending on the country in which they operate, pension funds may or may not have legal personality. Those with legal personality can take many forms. The two main ones are the trust/foundation and the corporate form. In other countries, pension funds are independent entities that lack legal personality and consist strictly of a legally separated pool of assets that can be managed by a financial company on behalf of the members. Often, only certain financial institutions are authorised to manage such pension funds (banks and insurance companies in Japan, life insurance companies or pension fund management companies in Portugal and Spain, pension fund management companies in the Czech Republic and Poland, and pension and portfolio management companies in Turkey).

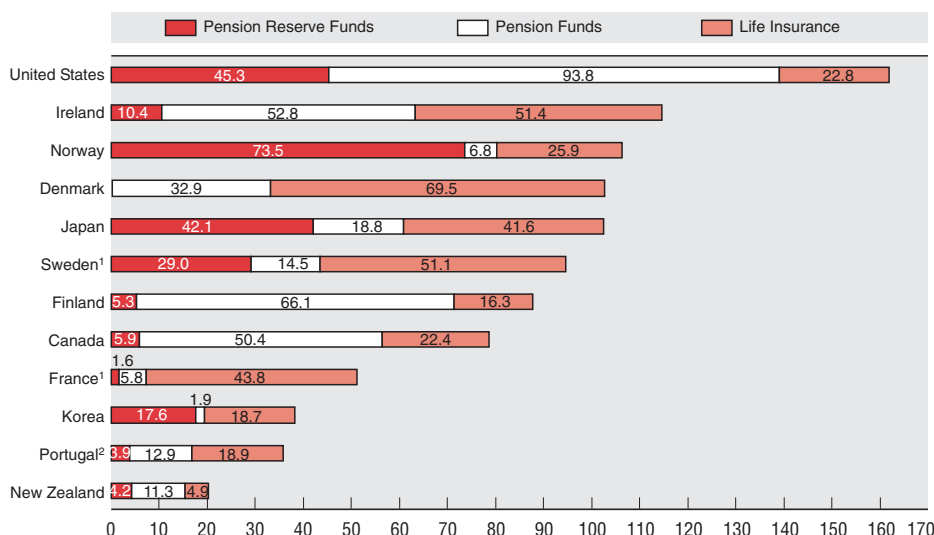
Application of the OECD pension plan classification to member countries

	Funded pension plans				Unfunded/ Pay-as you-go plan –pension reserve fund	
	Occupational		Personal			
	Mandatory and quasi- mandatory	Voluntary	Mandatory	Voluntary		
Australia	✓	✓	✓	✓	✓	
Austria		✓		✓		
Belgium		✓		✓		
Canada		✓		✓		
Czech Republic				✓		
Denmark	✓			✓		✓
Finland	✓	✓		✓		✓
France	✓	✓		✓		✓
Germany		✓		✓		
Greece		✓		✓		
Hungary	✓	✓	✓	✓		
Iceland	✓			✓		
Ireland				✓	✓	
Italy				✓		
Japan				✓	✓	
Korea				✓	✓	
Luxembourg				✓		
Mexico			✓	✓		
Netherlands				✓		
New Zealand				✓	✓	
Norway				✓	✓	
Poland			✓	✓		
Portugal				✓	✓	
Slovak Republic			✓	✓		
Spain				✓	✓	
Sweden	✓			✓	✓	
Switzerland	✓			✓		
Turkey		✓		✓		
United Kingdom		✓		✓		
United States		✓		✓	✓	

Source: OECD.

Figure 1. **Consolidated pension and life insurance assets
in selected OECD countries, 2005**

In per cent of GDP



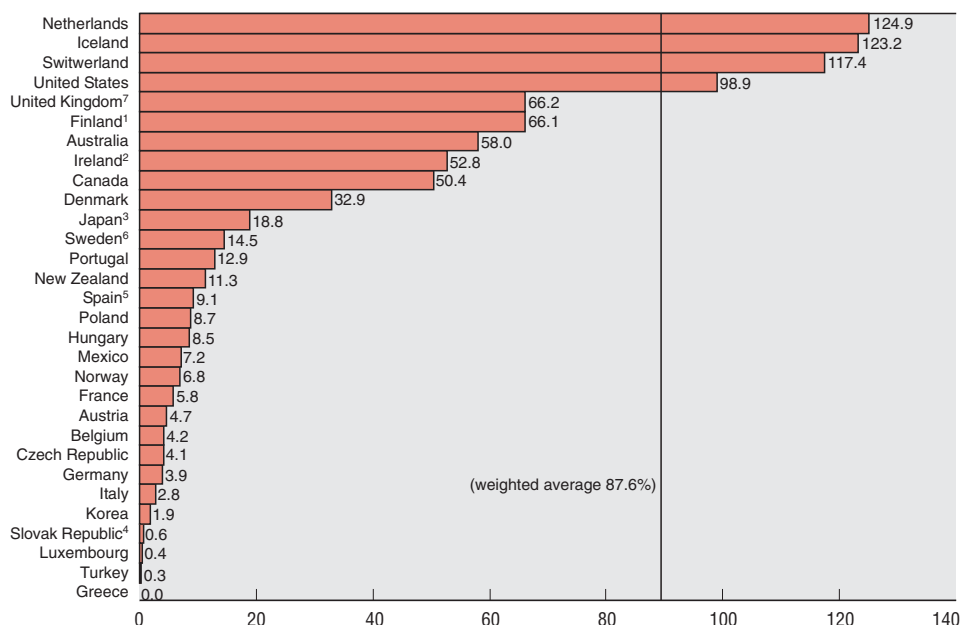
Source: OECD, Global Pension Statistics, Insurance Statistics and other administrative sources.

I. Trends in pension fund assets

In the past few years pension funds have steadily recovered from the equity market downturn of the early 2000s and shown robust asset growth. Total pension fund assets in the OECD area amounted to USD 17.9 trillion in 2005, up from USD 13.0 trillion in 2001. The annual aggregate growth rate of pension fund assets in US dollar terms was 8.7 per cent between 2001 and 2005.

World equity markets experienced a major slump between 2000 and 2003. Given the large equity holding in pension portfolios in many countries, directly and indirectly (see Table 3), the recession in the equity market put downward pressure on pension asset growth. The figures in Table 5 show that during the market downturn period, *i.e.* 2001-2002, pension fund assets in the OECD area declined from USD 13.0 trillion in 2001 to 12.1 trillion in 2002, equivalent to a decrease of 7.0 per cent. Since 2003, however, pension markets have gradually recovered and expanded accordingly, with assets of USD 14.6 trillion in 2003, USD 16.5 trillion in 2004, and USD 17.9 trillion in 2005. Looking across the whole recovery period, *i.e.* 2002-2005, the annual asset growth rate was 14.2 per cent.

Figure 2. **Importance of pension funds in OECD countries, 2005**
In per cent of GDP



Source: OECD, Global Pension Statistics.

Of all the OECD countries, the United States witnessed the most significant decline in pension fund assets during the downturn period, with assets dropping from USD 9.7 trillion to USD 8.8 trillion – a 9.6 per cent decrease – between 2001-2002, in contrast to the trend of significant expansion in some other countries. For instance, pension assets in France rose from USD 51.4 billion to USD 95.4 billion (an 85.6 per cent increase), those in Poland from USD 4.6 billion to USD 7.6 billion (a 64.2 per cent increase), while there were more modest rises in other countries, *e.g.* Australia from USD 212.9 billion to USD 239.3 billion (a 12.4 per cent increase), and Italy, from USD 25.2 billion to USD 28.3 billion (a 12.4 per cent increase).

Total pension fund assets in the OECD area rose slightly from 86.7 per cent of GDP in 2001 to 87.6 per cent in 2005.

In contrast to the large expansion of pension fund assets in US dollar terms as presented earlier, the small increase in the ratio of pension fund assets to GDP was mainly due to the corresponding rise in the value of GDP in the OECD countries. In the meantime during the period of the equity market downturn, *i.e.* 2001-2002, the ratio of assets to GDP dropped by 8.8 percentage points, while during the market recovery period, *i.e.* 2002-2005, the ratio exhibited an increase to reach the previous level.

Table 1 presents comparative statistics across countries. During 2001-2002, the Dutch pension market contracted most significantly, by 17.1 percentage points (from 102.6 per cent of GDP to 85.5 per cent of GDP), while the French market expanded by 2.7 percentage points (3.9 per cent of GDP to 6.6 per cent of GDP). In between these extremes, Canadian, Irish and Swiss pension assets dropped by 5.5, 9.2 and 7.7 percentage points respectively, while assets increased in Iceland and Mexico, by 1.0 and 0.9 percentage points respectively. By way of comparison, the growth rate of pension assets to GDP between 2002 and 2005 was larger than between 2001-2002. Of 27 countries for which data are available, only two had negative growth rates of assets to GDP between 2002 and 2005 – Belgium and New Zealand.

Table 1. **Evolution of the size of pension funds relative to GDP, 2001-2005**

OECD Countries	Total investments of pension funds				
	In per cent of GDP				
	2001	2002	2003	2004	2005
Australia	57.7	58.1	54.4	51.4	58.0
Austria	3.9	3.9	4.2	4.5	4.7
Belgium	5.5	4.9	3.9	4.1	4.2
Canada	53.3	47.8	52.1	48.9	50.4
Czech Republic	2.3	2.8	3.1	3.6	4.1
Denmark	27.2	25.5	27.4	29.8	33.6
Finland (1)	8.2	8.0	8.3	45.3	66.1
France	3.9	6.6	7.0	6.0	5.8
Germany	3.4	3.5	3.6	3.8	3.9
Greece	—	—	—	—	—
Hungary	4.0	4.5	5.3	6.9	8.5
Iceland	84.7	85.7	99.9	108.0	123.2
Ireland (2)	44.3	35.1	39.4	42.0	52.8
Italy	2.3	2.3	2.4	2.6	2.8
Japan (3)	13.9	14.1	15.3	15.2	18.8
Korea	..	1.5	1.6	1.7	1.9
Luxembourg	..	..	..	0.3	0.4
Mexico	4.3	5.2	5.8	6.3	7.2
Netherlands	102.6	85.5	101.3	108.7	124.9
New Zealand	14.7	13.0	11.3	11.3	11.3
Norway	4.0	4.0	4.6	6.6	6.8
Poland	2.5	4.0	5.5	7.0	8.7
Portugal	11.5	11.5	11.8	10.6	12.9
Slovak Republic (4)	0.0	0.0	0.0	0.0	0.6
Spain (5)	5.8	5.7	6.2	9.0	9.1
Sweden (6)	8.2	7.6	7.7	12.4	14.5
Switzerland	104.4	96.7	103.6	108.5	117.4
Turkey	..	..	..	0.1	0.3
United Kingdom (7)	72.5	68.9	65.1	68.8	70.1
United States	96.2	84.1	96.2	99.6	98.9
Total OECD	86.7	75.5	84.8	87.3	87.6

Source: OECD, Global Pension Statistics.

A major reason explaining the magnitude of the decline and rise in pension fund assets across countries is the exposure to equity and equity-related products in the pension portfolios. In general, the more the exposure to equity and equity-related products, the greater the changes in pension assets were between 2002 and 2005.

In the same period, the Netherlands and Iceland had the largest pension fund markets relative to their economies. As shown in Figure 2, in 2005, their pension fund assets to GDP ratio was 124.9 per cent and 123.2 per cent respectively, partly due to the relatively small size of their economies alongside their developed financial and pension fund markets. At the other end of the spectrum in Luxembourg, Turkey and Greece, pension fund markets were at the initial stage of development, with ratios of 0.3 per cent, 0.3 per cent and 0 per cent, respectively.

The variation in pension fund assets within OECD countries, in both US dollar terms and relative to GDP, reflects the differences in the design and maturity of the pension systems.

Many factors need to be taken into account when designing a pension system. These include, among others, socio-economic trends, demographic structure, fiscal position, and the power of the trade unions. The differences in these factors across countries explain the variations in their pension systems, which, in turn, directly relate to the size of the pension assets accumulated in each individual country. In some countries, like the United Kingdom and the United States, private (occupational) pension plans started decades ago, and, not surprisingly, these two countries have the largest pension markets in absolute value. Large sums of pension assets have also been accumulated in two other Anglo-Saxon countries – Australia and Canada – and in some other countries, for instance, Japan, the Netherlands, and Switzerland.

Many countries have followed a different model, where public pensions play a dominant role in the old-age retirement system. Examples include some continental European countries like France, Greece, Italy and Spain. Table 1 and Table 5 provide statistics showing the small size of pension assets accumulation in those countries. For instance, in 2005, the French private pension market's accumulated assets amounted to USD 123.3 billion or 5.8 per cent of GDP.

In addition to the two groups of countries referred to above, many other countries have started to introduce and promote private pension plans over the past decade, notably some Central and Eastern European countries. Given the small asset base in those countries, pension fund assets grew quite significantly, as shown in Table 1 and Table 5. For example, in the Czech Republic, pension assets in dollar terms over the five-year period 2001-05 grew from USD 1.4 billion to USD 5.0 billion, in Hungary from USD 2.1 billion to USD 9.3 billion, and in Poland from USD 4.6 billion to USD 26.3 billion. For these countries, the corresponding five-year growth rate was

37.5 per cent, 45.7 per cent and 54.5 per cent, respectively. Assets in these emerging pension markets are expected to increase rapidly in the future.

Two other factors affecting the growth of private pension assets relate to whether participation is mandatory, and whether tax incentives are supportive. As reported in the December 2005 issue of *Pension Markets in Focus** fourteen out of 30 OECD countries had mandatory or quasi-mandatory pension systems. Australia implemented pension reforms in 1992, characterised by a 9 per cent rate of mandatory employer contribution. Concerning the taxation of private pension funds, the most popular arrangement for the tax treatment of private pensions is exempt-exempt-tax (EET), that is, pension contributions and investment incomes are exempt from taxation while pension payments are taxed. In 2003, the EET arrangement was used in 22 out of 30 OECD countries, for example, Canada, Finland and Iceland. Among countries not applying the EET regimes were Australia, Hungary, and New Zealand (see Antolin, P., *et al.* (2004): Long-term Budgetary Implications of Tax-favoured Retirement Plans, OECD).

Largely as a result of the continued rallying of the equity market in recent years, pension funds in many OECD countries enjoyed high returns in 2005.

In Australia, the nominal return was 10-14 per cent, depending on the type of plan, in Belgium it was, on average, 14.9 per cent, 14.0 per cent in Denmark, 13.0 per cent in the Netherlands and 12.7 per cent in Norway.

High returns led to rapid expansion in pension fund assets. Two of the countries with considerable asset growth were Turkey and the Slovak Republic. The Turkish pension market expanded from USD 209 million in 2004 to USD 919 million in 2005. In the Slovak Republic, pension assets increased from USD 7 million in 2004 to USD 291 million in 2005. The large increase in Turkish and Slovak pension assets in 2005 was largely attributable to the small asset base and the structural pension reforms.

The German private pension market is expected to grow in the next few years due to the post-2000 pension reforms. Meanwhile, it is reported that the premium income for "Pensionskassen", which is one of the two main types of pension fund in this country, rose by almost 25 per cent in 2005.

The increasing control that individual members have over their retirement assets is observable across OECD countries, bringing greater flexibility and also signalling the growing importance of financial education.

Various countries have strengthened individual choice in their mandatory, defined contribution plans, allowing individual members control over invest-

* Available at www.oecd.org/daf/pensions. See also "The OECD Global Pension Statistics Project: Overview of the Financial Health Accumulated under Funded Pension Arrangements" in the previous issue of *Financial Market Trends* (No. 90).

ments. For example, starting from 2005, a new law in Mexico allows members to switch from one fund manager to another fund manager without waiting for the previously stipulated one-year period as long as they are moving to a lower-fee fund manager. This new law introduces greater competition to the industry but also gives more flexibility and control to members. In addition, there was an increase (7.5 per cent) in the number of small self-managed superannuation funds (less than four members) in Australia in 2005. This increase was largely attributable to the willingness of members to take control of their retirement assets, since all the members in such small self-managed funds are normally involved in the operation of the fund.

Giving more flexibility and control to individual members can be beneficial, as it recognises the differences between people in preferences (for example, risk aversion). Members can choose between different investment portfolios in some mandatory defined contribution system such as Sweden's and Mexico's (see Box 2 for details). However, at the same time the lack of financial knowledge of individual members is a major policy concern.

In view of the potential fiscal costs, many OECD countries have taken action to increase the long-term sustainability of existing pension systems through parametric reforms in 2005.

For example, in 2005, Turkey introduced regulations raising the retirement age and making it harder for participants to access benefits before this point. In Finland, the formula used to calculate DB benefits was changed in 2005, so that benefits became based on earnings throughout the whole working life rather than a specific shorter period of relatively high earnings. In addition, benefits were linked to average life expectancy, which has a direct impact in curbing the increase in pension expenditure. In the Netherlands, many occupational pension plans now have benefits based on average earnings rather than final salary.

In Italy, a new law aimed to boost the growth of private pensions was approved at the end of 2005. Under the new provisions (the so-called TFR, or "trattamento di fine rapporto", expected to become effective by 2008), an amount equivalent to 7 per cent of salaries will be automatically paid into occupational pension funds, unless the interested worker explicitly opposes this. The annual flow of TFR is about EUR 15 billion. The new law also provides fiscal incentives to stimulate the growth of pension funds, to increase transparency and comparability of all pension plans, and to strengthen the role of COVIP, Italy's private pension supervisor.

In Hungary, a new law passed in December 2005 would potentially promote pension asset growth. The new regulation features an additional pillar, which is a fully funded personal savings account. This change is promising in that it offers

flexibility as individuals can make investment decisions. It also offers low operating costs.

With regard to operating costs, Mexican pension funds recorded an 11.7 per cent cost reduction in 2005, mainly due to increased competition among pension fund managers (Afores) following the new Retirement and Saving Systems Law of the beginning of 2005. A number of other OECD countries also witnessed a fall in operation costs. For example, total expenditure dropped by 3.1 per cent for Canadian pension trust funds and 5.0 per cent for Danish life insurance companies and pension funds in 2004-2005.

In the OECD area, the retirement landscape is changing as the number of occupational DB plans is decreasing whilst there has been a corresponding increase in DC plans.

Statistics in the left panel of Table 2 show that, as of 2004, eight out of 21 OECD countries accumulated an amount of DC plan assets equivalent to over half of total

Table 2. **DB vs. DC in occupational plans in selected OECD countries, 2004**

In per cent of total assets

OECD Countries	DC vs. DB plans in <i>occupational</i>		DC vs. DB plans in <i>total occupational and personal plans</i>	
	DC plans	DB plans	DC plans	DB plans
Australia	83	17	91	9
Austria	75	25	..	..
Belgium	25	75	..	..
Canada	7	93	37	63
Denmark	97	3	97	3
Finland	0	100	20	80
Germany ¹	0	100	..	..
Greece	50	50	..	..
Iceland	82	18	84	16
Ireland	98	2	..	..
Italy	75	25	79	21
Japan	1	99	4	96
Korea	0	100	61	39
Netherlands	9	91	..	..
New Zealand	52	48	71	29
Norway	0	100	..	..
Portugal	2	98	4	96
Spain	97	3	99	1
Sweden	5	95	41	59
United Kingdom	22	78	..	..
United States	35	65	55	45

Source: OECD, Global Pension Statistics, various sources, and OECD Secretariat estimates.

occupational pension assets. This is particularly the case in Denmark, Ireland and Spain where virtually all occupational pension assets were accounted for by DC plans. In Australia, Austria, Iceland and Italy, DC plans also played a significant role. Despite DC plans' increasing popularity in the above OECD countries, DB plans accounted for all occupational assets in four countries, *i.e.* Finland, Germany, Korea and Norway. In Canada, Japan, the Netherlands, Portugal and Sweden, DB assets comprised over 90 per cent of the total occupational pension assets.

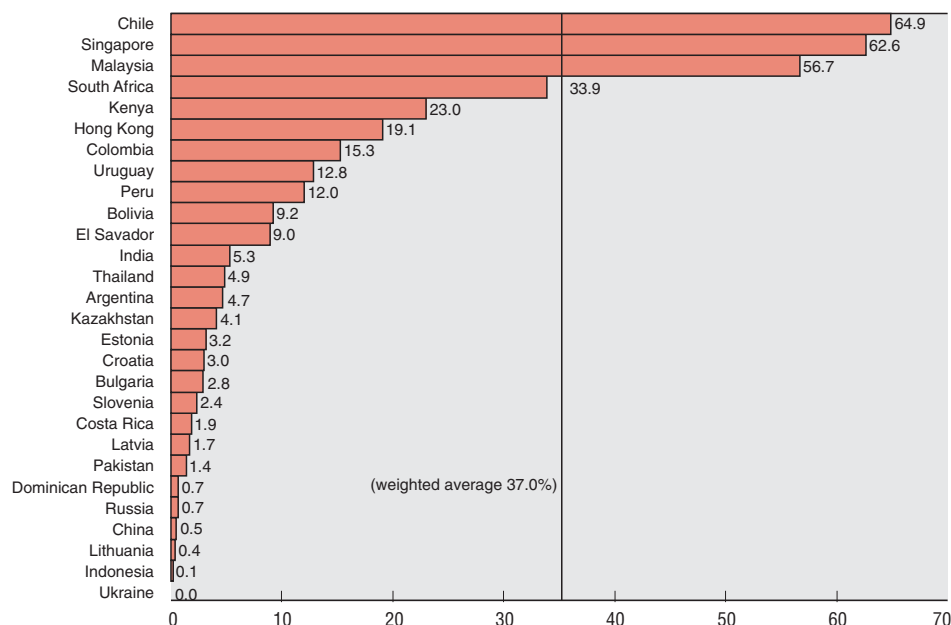
When personal pension plans are incorporated into the analysis, assets accumulated in DB plans become less significant relative to the total assets. The split data of DC and DB assets in the aggregated occupational and personal plans are given in the right panel of Table 2. For example, in 2004 the Canadian DB plans accounted for 93 per cent of occupational pension assets, while they accounted only for 63 per cent of total occupational and personal pension assets. Correspondingly the share of the Canadian DC plan assets increased from 7 per cent to 37 per cent. This observation was applicable to all other countries, except Denmark and those countries without data. In particular, as of 2004 in Finland and Korea, all occupational assets were held in DB plans. In term of total occupational and personal pension assets, however, the share of DB plan assets dropped to 80 per cent, and 39 per cent, respectively.

II. Focus on pension markets for selected non-OECD members

When compared with OECD countries, pension markets in most of the selected non-OECD members were at an early stage of development, with the weighted average ratio of pension fund assets to GDP across 27 economies being 34.0 per cent as of 2005, compared to 87.6 per cent for the OECD area.

Statistics in Figure 3 indicate that as of 2005 the largest non-OECD pension fund market as a per cent of GDP was in Chile, where the ratio of pension assets to GDP was 64.9 per cent. This ratio was 62.6 per cent for Singapore and 33.9 per cent for South Africa. For all other economies, pension fund markets were at an early stage of development since total pension assets accounted for less than 30 per cent of the respective GDP, *e.g.* Colombia (15.3 per cent), India (5.3 per cent), Kenya (23.0 per cent), Russia (0.7 per cent) and Slovenia (2.4 per cent). One of the oldest pension funds outside the OECD is Singapore's, where the funded provident pension system was adopted in the 1950s. Following successful implementation of pension reform in Chile in 1981, many other countries have followed the lead, *e.g.* Argentina in 1994, the Dominican Republic in 2003, Bulgaria in 2000, Croatia 2002, China in 1997, and Peru in 1993. Based on statistics in Figure 3, pension fund markets in most of the selected non-OECD economies have been characterised by small asset accumulation so far; however, given

Figure 3. **Pension fund assets in selected non-OECD members, 2005**
In per cent of GDP



Source: OECD, Global Pension Statistics.

the funded nature of the new pension systems introduced in those above-mentioned economies, it is expected that pension assets will expand in the following years.

III. Pension fund asset allocation

Pension funds in the OECD countries are, in general, heavily invested in bonds, but there are major differences across countries, with some having over one third of their assets invested in equities.

Table 3 shows the dominant role bonds play in pension fund portfolios in many OECD countries. For example, in 2005, 54.5 per cent of Austrian pension funds were invested in bonds, of which 74.7 per cent in public bonds and 25.3 per cent in private bonds. Other countries where bonds exceeded 50 per cent of their pension fund portfolios in 2005 include the Czech Republic (82.4 per cent), Denmark (50.3 per cent), France (63.4), Hungary (75.5 per cent), Korea (78.9 per cent), Mexico (94.8 per cent), Norway (55.4 per cent), Poland (63.4 per cent), Spain

Table 3. **Structure of assets of pension funds in selected OECD countries, 2005**
In per cent of total assets

	Cash and deposits	Bills and bonds issued by public and private sector	Of which: Bills and bonds issued by public administration	Of which: Bonds issued by the private sector	Loans	Shares	Land and buildings	Mutual funds (CIS)	Unallocated insurance contracts	Private investment funds	Other investments
OECD Countries											
Australia	2.3	—	..	..	7.0	21.7	1.2	65.9	—	—	1.9
Austria	3.6	54.5	74.7	25.3	0.8	36.5	1.3	..	..	..	3.2
Belgium	2.5	6.7	60.2	39.8	0.3	9.8	1.1	74.9	1.2	..	3.5
Canada	4.3	22.5	78.9	21.1	0.6	25.8	3.3	39.8	—	..	3.7
Czech Republic	—	82.4	73.2	26.8	—	—	0.6	—	..	..	17.0
Denmark (1)	0.7	50.3	52.9	46.9	—	25.9	1.7	11.2	—	..	10.2
Finland	—	45.7	100.0	—	5.2	41.3	7.7	..	..	..	0.1
France	1.6	63.4	..	..	1.2	5.3	3.1	25.8	..	..	0.3
Germany (2)	3.3	30.7	4.3	95.7	27.3	34.5	3.4	—	—	0.6	0.2
Hungary (3)	1.4	75.5	98.2	1.8	—	7.8	0.2	9.0	—	—	6.1
Iceland	1.7	49.9	53.9	46.1	8.7	34.5	0.1	1.8	—	..	3.3
Italy (4)	4.7	36.5	79.2	20.8	—	9.9	7.8	11.3	23.9	—	5.9
Korea	8.0	78.9	35.5	64.5	10.9	0.7	—	0.1	—	—	1.3
Luxembourg	6.8	33.2	—	—	—	10.6	—	—	—	45.8	3.6
Mexico	—	94.8	88.4	11.6	—	1.3	—	—	—	—	2.2
Netherlands	2.5	38.3	8.5	91.5	3.4	49.8	3.7	—	—	—	2.3
Norway	4.9	55.4	40.7	59.3	1.9	28.9	4.6	..	..	..	4.3
Poland	4.1	63.4	98.2	1.8	—	32.0	—	—	—	—	0.4
Portugal (5)	10.0	40.5	61.9	38.1	—	21.1	8.1	22.1	—	—	−1.9
Spain	7.3	60.2	30.3	69.7	1.0	15.2	3.2	9.0	—	—	2.4
Switzerland (6)	7.9	25.6	..	..	6.3	16.9	9.6	30.2	—	3.0	0.6
Turkey (7)	—	80.5	100.0	—	—	11.6	—	—	—	—	7.6
United Kingdom (8)	2.2	20.2	63.8	36.2	0.5	40.1	3.8	18.0	8.5	..	6.6
United States (9)	4.8	14.7	59.7	40.3	0.7	41.3	0.7	23.5	5.2	..	9.1

Table 3. **Structure of assets of pension funds in selected OECD countries, 2005** (*cont.*)

In per cent of total assets

	Cash and deposits	Bills and bonds issued by public and private sector	<i>Of which:</i> Bills and bonds issued by public administration	<i>Of which:</i> Bonds issued by the private sector	Loans	Shares	Land and buildings	Mutual funds (CIS)	Unallocated insurance contracts	Private investment funds	Other investments
Selected non-OECD countries											
Brazil (10)	44.2	17.1	..	..	3.9	15.9	6.7	11.6	—	..	0.6
Bulgaria	19.2	69.1	72.5	27.5	—	6.4	0.7	0.8	—	—	2.7
Colombia	1.1	65.9	71.8	28.2	—	11.3	—	3.8	—	—	18.0
Estonia	5.2	45.4	54.6	45.4	—	38.7	0.5	8.9	—	—	1.3
Slovenia	15.3	76.7	53.4	46.6	..	4.5	—	3.4	..	..	0.1
Indonesia (10)	70.9	10.2	..	..	0.7	4.1	6.0	1.3	—	..	6.9
Singapore (10)	2.7	96.4	..	..	—	—	0.2	—	—	..	0.7
Thailand (8)	40.1	42.0	56.8	43.2	..	15.0	..	1.8	..	..	1.1

Note: Total may not add up due to rounding or to negligible value.

Source: OECD, Global Pension Statistics.

Box 1. **Two simple measures of potential “scarcity” of pension fund investments**

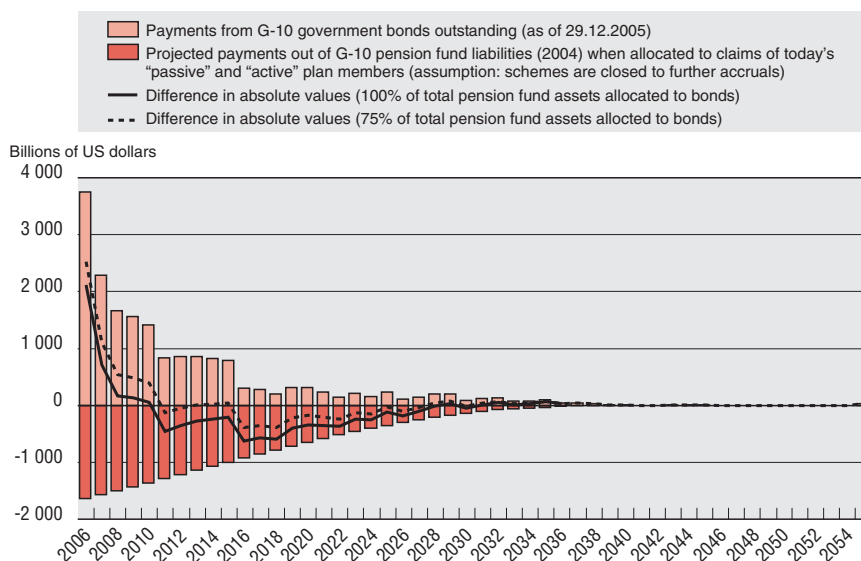
The *Pension Markets in Focus* issue of December 2005 included a discussion of the potential scarcity of suitable pension fund investments, and it drew attention to an empirical measure of the difference between the supply of high-quality, fixed-income instruments (issued by G-10 governments) and estimates of potential demand from pension funds for such instruments. This measure suggests that, under specific circumstances, the demand for long-term government bonds from pension funds in the G-10 area may exceed the supply by a large margin. This box describes an update of this measure and discusses the robustness of the main results with respect to changes in the underlying assumptions.

To capture variations in pension funds' demand for bonds across different maturity segments, two alternative “scarcity” measures are considered here, both of which compare the time patterns of (estimated) future pension fund payment promises with the cash flows that pension funds could obtain from investing in government bonds. Such a comparison is similar in its approach to the strategy of cash-flow matching, whereby pension fund managers attempt to immunise their balance sheets by matching projected payouts with payments generated by investments in government bonds. Cash flows that can be generated through investments in government bonds are calculated based on detailed bond-specific information on the timing and amounts of coupon and principal payments. The cash flows implied by the current stock of outstanding G-10 government bonds are then compared to projections of aggregate payment promises from pension funds to their current plan members, under the assumption that current liabilities are equivalent to pension fund assets (data for which are available from the OECD Global Pension Statistics Project). The estimated term structure of payment promises out of pension liabilities 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). It is assumed 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 results are given in the upper panel of Figure 1, which shows that, under a set of simplifying assumptions, potential “scarcity” would be greatest in absolute values in the maturity segment beyond ten years.

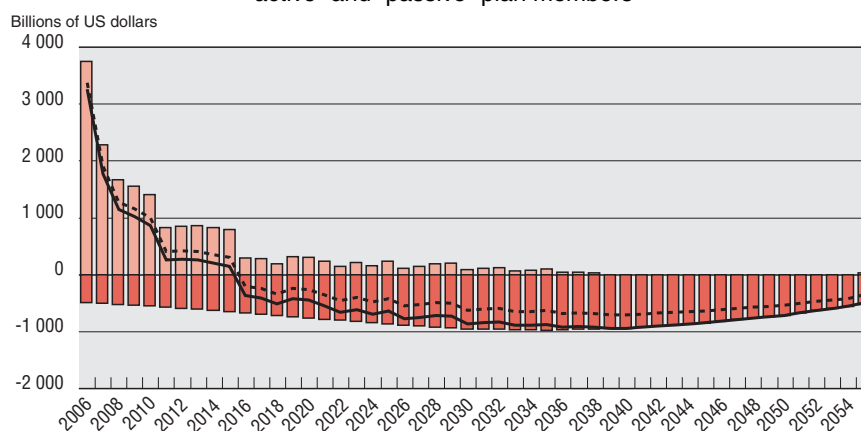
To see how robust these results are with regard to changes in the underlying assumptions the assumption that no new liabilities are incurred is dropped. Instead, it is assumed that (estimated) liabilities are owed both to current “active” and “passive” members, and that “active” plan members will continue to accumulate pension claims. Again, data on general population demographics in the G-10 countries are used to proxy the “population” of pension plans, whereby it is assumed that people older than 25 years have acquired pension claims as a function of their age. The results are shown in the lower panel of Figure 1, and they broadly confirm the ones shown in the upper panel.

Box 1. Two simple measures of potential “scarcity” of pension fund investments (Cont.)

Box Figure 1. Cash flows from G-10 government bonds and projected pension payments
“passive” plan members



“active” and “passive” plan members



Box 1. Two simple measures of potential “scarcity” of pension fund investments (Cont.)

Note, however, that there are some differences in nuances between the measures, reflecting the difference in the projected pattern of pension payments. While payments are projected to strictly decline under the first measure (upper panel of Figure 1), the second measure projects that they increase until they peak around the year 2035, before declining thereafter. The first measure implies that there may be a “scarcity” of G-10 government bonds in the segment from 10 to 20 years, although it declines towards the latter part of that segment. The second measure shows more pronounced scarcity, spanning the full long-term to ultra-long-term segment (lower panel of Figure 1). The second measure is preferable, on the basis of its less restrictive assumption regarding payment promises. In any case, both measures suggest that the demand for long-term government bonds may exceed the supply by a large margin.

Note: Cash flows from outstanding G-10 government bonds on the positive axis (as of December 2005). On the negative axis are estimates of payments by pension funds to beneficiaries, assuming that payments are due to “passive” members only (see Figure 1) or to “passive” as well as “active” plan members (see Figure 1). “Passive” plan members are defined as people 65 years of age or older in 2005. Active plan members are defined as people aged between 20 and 64 years old in 2005 aggregated over all G-10 countries. For more details see the Source reference.

Source: This box was prepared by Sebastian Schich and draws on: Schich, S. and M. Weth (2006), “Potential pension fund demand for high-quality long-term bonds: Quantifying ‘scarcity’ of suitable investments”, OECD Financial Market Trends Vol. 2006/1, No. 90.

(60.2 per cent), and Turkey (80.5 per cent). At the same time, in all countries where figures are available, public sector bonds comprise a significant portion of the combined bond holdings, with four exceptions: Germany, Korea, the Netherlands and Spain.

Within the OECD area, four countries, namely Finland, the Netherlands, the United Kingdom and the United States witnessed a large allocation of pension fund assets to shares. For example, in Finland, 41.3 per cent of pension fund assets were invested in shares, while in the Netherlands, the United Kingdom and the United States, shares accounted for 49.8 per cent, 40.1 per cent and 41.3 per cent of pension fund portfolios, respectively. In comparison to last year's data (see the December 2005 issue of *Pension Markets in Focus* for details about 2004 data), more assets were allocated to shares in 2005; in 2004, shares comprised 30.4 per cent of total pension assets in Finland, 44.6 per cent in the Netherlands and 35.5 per cent in the United States.

Partly due to large allocation to shares, bonds did not make up a significant portion of pension portfolios in these countries except Finland. For example,

in 2005 bond holdings relative to total portfolio assets was 38.3 per cent in the Netherlands, 20.2 per cent in the United Kingdom and 14.7 per cent in the United States, while this ratio was relatively high in Finland, *i.e.* 45.7 per cent. Against the background of a rise in the allocation to shares in these countries over 2004-2005, changes in allocation to bonds were uneven in that Finnish and Dutch pension funds reduced their bond holdings from 50.1 per cent and 39.3 per cent in 2004, while the US pension funds increased the holding from 11.4 per cent in 2004.

Pension funds allocated a very small share of assets to cash and deposits in most OECD countries, mainly due to low returns. The two OECD countries with the most significant proportion of cash and deposits in their pension fund portfolios were Korea (8.0 per cent) and Portugal (10.0 per cent).

By contrast, pension asset allocation in non-OECD developing countries was not as diverse as in OECD countries, and, in most cases, a significant portion of pension funds were allocated to bonds and other safer assets like cash and deposits.

As shown at the bottom of Table 3, some non-OECD countries show significant investment in cash and deposits. Brazilian pension funds, for instance, allocated 44.2 per cent of assets to cash and deposits, while this figure was 70.9 per cent and 40.1 per cent for Indonesian and Thai pension funds, respectively. In addition, bonds were a major asset class in pension portfolios in those countries. In Bulgaria, 69.1 per cent of assets were allocated to bonds, 65.9 per cent in Colombia, 76.7 per cent in Slovenia and 96.4 per cent in Singapore in 2005. The main reasons for the large proportion of pension fund investment in cash and bonds were the restrictive investment regulations, the unavailability or scarcity of appropriate investment instruments in those countries and high interest rates.

Shares made up a small proportion of total assets in non-OECD economies, with the ratio of shares to total assets being 15.9 per cent in Brazil, 11.3 per cent in Colombia, 4.5 per cent in Slovenia, 0 per cent in Singapore and 15.0 per cent in Thailand. The only exception was Estonia, where 38.7 per cent of pension assets were in shares.

Table 4 shows the asset allocation of pension funds in selected Latin American countries for 2005. Due to different asset classifications, the data are not directly comparable to those in Table 3. However, the general impression is of heavy investment in the state sector, *i.e.* government bonds. For example, in five out of eight countries – Argentina, Bolivia, Costa Rica, El Salvador and Uruguay – over half the total assets were in the state sector. Assets invested in the corporate sector were significant in Peruvian pension portfolios as they accounted for 50.3 per cent of total assets, while in the Dominican Republic, almost all pension assets, *i.e.* 96.8 per cent, were invested in the financial sector, *i.e.* securities issued by the banks. As far as foreign assets are concerned, most of the Latin American countries presented in Table 4 held a small portion of assets in the foreign sector. The main

Table 4. **Asset allocation of selected Latin American countries, 2005**
In per cent of total investments

	State sector	Corporate sector	Financial sector	Foreign sector	Other assets
Latin American countries					
Argentina	57.9	15.2	16.5	8.9	1.6
Bolivia	76.7	16.9	3.7	2.5	0.3
Chile	16.5	23.3	29.7	30.4	0.1
Costa Rica	70.9	5.1	24.0	0.0	0.0
El Salvador	80.9	0.3	12.8	6.0	0.0
Peru	20.4	50.3	19.1	10.2	0.0
Dominican Republic	0.0	3.2	96.8	0.0	0.0
Uruguay	83.4	4.3	8.8	0.0	3.5

Note: Total may not add up due to rounding or to negligible value.

Source: International Federation of Pension Funds Administrators

exception was Chile, with 30.4 per cent of pension assets invested abroad in 2005, implying that the Chilean pension markets were relatively developed and the investment regulation regime was more lenient.

Different regulatory regimes across countries partly explain their different pension asset allocations.

In general, Anglo-Saxon countries adopt the prudent person rule (PPR) in pension fund investment. Under the PPR approach assets should be invested “prudently” rather than limited according to category, and there are few investment restrictions on any specific assets. In practice this appears to lead to a higher share of assets in equities. For example, Australian pension funds allocated 21.7 per cent of assets to equities in 2005, while this figure was 25.8 per cent for Canada, 40.1 per cent for the United Kingdom and 41.3 per cent for the United States. Different quantitative asset restrictions (QAR) have traditionally been applied in many other countries and normally stipulate upper limits of investment in specific asset classes, *e.g.* equities and foreign assets (see OECD’s Survey of Investment Regulations of Pension Funds for pension investment regulations as of December 2005, available at www.oecd.org/daf/pensions/).

In addition to the difference in regulatory regimes, another factor with an increasingly important impact on pension fund investment in major OECD countries, notably the United Kingdom, relates to the recent changes in pension accounting standards.

International Accounting Standard (IAS19), stipulates that the difference between the assets and liabilities of defined benefit (DB) plans should be reported on the balance sheet of the sponsoring company using market-based valuation methods. In the UK, the FRS17 requires immediate recognition of actuarial gains and losses. Previously, actuaries were allowed to smooth such changes

Box 2. **Investment choice in mandatory pension funds in selected OECD and non-OECD countries**

A recent global trend in individual accounts plans is the introduction and expansion of investment choice to plan members. This global trend is founded on the traditional economic assumption that well informed agents act rationally to maximise their self-interest. Consequently, investment choice enables plan members to select the optimal investment portfolio that matches their particular risk-return preferences and ultimately, maximises retirement incomes.

Under this new investment plan – known in some countries as multifunds system –, pension funds administrators are allowed to offer different investment portfolios targeting different age groups. This innovation was designed to allow workers to achieve a portfolio distribution which is more in line with their preferences and needs, as far as risk and yield are concerned. The funds are differentiated by the proportion of their portfolio invested in equities, where the greater the investment in equities, the greater the risk and the greater the expected return.

The introduction of investment choice means that members can exercise their own preferences, thereby producing increased well-being. Different members may have different preferences concerning the composition of the portfolio of their pension funds, and these are reflected in differing degrees of aversion to risk. Younger members may prefer a pension fund with a higher level of risk and expected return, in order to increase the expected value of their pension, whereas older members may prefer a fund with minimal risk, in order to minimise the fluctuations in the value of their pension.

Multiple funds have other positive results, both for the pension system and for the capital market in general. Firstly, they provide incentives to seek information regarding the pension fund's performance; secondly, they enhance the services provided by administrators; thirdly, they increase member participation; and fourthly, they improve the allocation of resources.

However, there are also arguments against expanding choice. On the one hand, wider choice comes at a much higher cost because dividing individual pension contributions between different funds and providing information on different investment options can be costly. On the other hand, individual choice imposes two other kinds of costs to participants. Firstly, the opportunity cost of spending time making decisions that could be used in other activities; and, secondly, the cost associated with sub-optimal investment choices. Finally, evidence strongly suggests that too much choice is as detrimental as too little choice. Choices overload undermines effective decision making by consumers in complex areas such as pensions.

The following Box Table 1 shows the number of investment options in selected OECD and non-OECD member countries that have allowed investment choice in their mandatory individual account system. Although, the different investment alternatives vary across countries, by the end of 2005, most of the countries mentioned in the table below have allocated over 50 per cent of the pension assets in those investment portfolios with the highest equity allocation which may exhibit a high risk tolerance of the member in these systems (see Box Figure 2).

**Box 2. Investment choice in mandatory pension funds
in selected OECD and non-OECD countries (cont.)**

**Box Table 1. Selected countries with mandatory individual account systems
that have allowed investment choice, December 2005**

Country	Number of Investment options
Sweden (Premium pension system)	By December 2005, over 700 funds were registered in the system. Around 50% of assets are invested in equity funds and 30% in the default option.
Hong Kong, (Mandatory provident fund)	Currently there are 307 different investment funds. 70% of the total assets were invested in balanced and equity funds with an equity exposure of 70% to 100%
Australia (Superannuation pension system)	The new choice of fund legislation means that from 1 July 2005, certain employees will be able to choose which super fund their compulsory employer contributions are paid into.
Chile	Each administrator can offer five different funds, which vary between 0% and 80% of equity exposure. Around 30% of members had made an active choice of some type of fund. Of them, 66% of members selected those funds with the highest equity exposure.
Mexico	Each administrator can offer two different funds, which vary between 0% and 15% of equity exposure. Around 90% of total assets are invested in the riskiest fund.
Peru	Each administrator can offer three different funds, which vary between 10% and 80% of equity exposure. Only 1% of the participants had made an active choice of fund, and less than 0.1% had selected the riskiest portfolio.
Estonia, Latvia and Slovakia	Pension companies in each country may offer three different investment portfolios to their members. Over 50% of members in each country have invested their pension contributions in those funds with the highest equity exposure.

across years. Under FRS17 volatile assets such as equities introduce more volatility onto corporate balance sheets creating a preference for bonds. This arguably can create a vicious circle as the greater the demand for bonds, the lower the yield, and the lower the yield, the greater the pension liabilities, given that liabilities are discounted using bond yields.

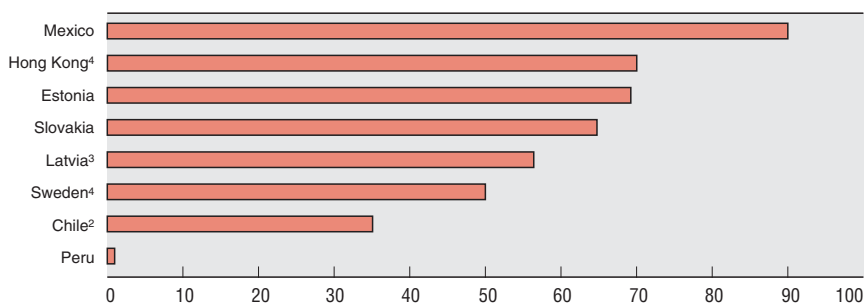
As asset-liability management has become more of a focus for the pension investment community there has been an increased exposure to bonds in countries with large accumulations of DB plan assets.

Compared to the 2004 data (see the December 2005 issue of *Pension Markets in Focus* for details of 2004 data), changes in asset allocation for 2004-2005 differ across

**Box 2. Investment choice in mandatory pension funds
in selected OECD and non-OECD countries (cont.)**

**Box Figure 2. Percentage of total assets invested in those pension
investment options with the highest equity allocation, 2005**

In per cent of total investments



1. The portfolio with the highest equity allocation varies across countries.
2. The information includes the two portfolios with the highest equity allocation.
3. 2004.
4. For Sweden, the information includes only equity funds. For Hong Kong, the information includes equity and balanced funds.

Note: This box, describing briefly the investment choice in pension funds in selected OECD and non-OECD countries, was prepared by Waldo Tapia, consultant in the OECD Financial Affairs Division. A more detailed analysis and description of these systems will appear in a forthcoming paper ("Individual Choice in Selected Countries", December 2006).

countries. For example, some countries saw a decline in bond allocations – Finland by 4.4 per cent, Mexico by 2.1 per cent – while other countries had an increase in bond investment – Poland by 3.2 per cent and Spain by 3.5 per cent. A similar uneven change in other asset classes across countries can also be observed. In order to highlight the general trend across countries between 2004 and 2005, the aggregate changes across OECD countries by pension assets were calculated. These estimates indicate a rise in allocation to bonds (2.2 per cent), loans (0.4 per cent), equities (4.3 per cent) and other investments (3.6 per cent), while a decline in cash (–2.4 per cent), mutual funds (–4.9 per cent) and unallocated insurance contracts (–3.0 per cent) over the period 2004–2005. Greater investment in bonds might reflect changes in the accounting rules and the increasing popularity of matching assets and liabilities, as discussed earlier, while increased allocation to equities could be largely attributable to the strong performance of the world stock markets over the last year.

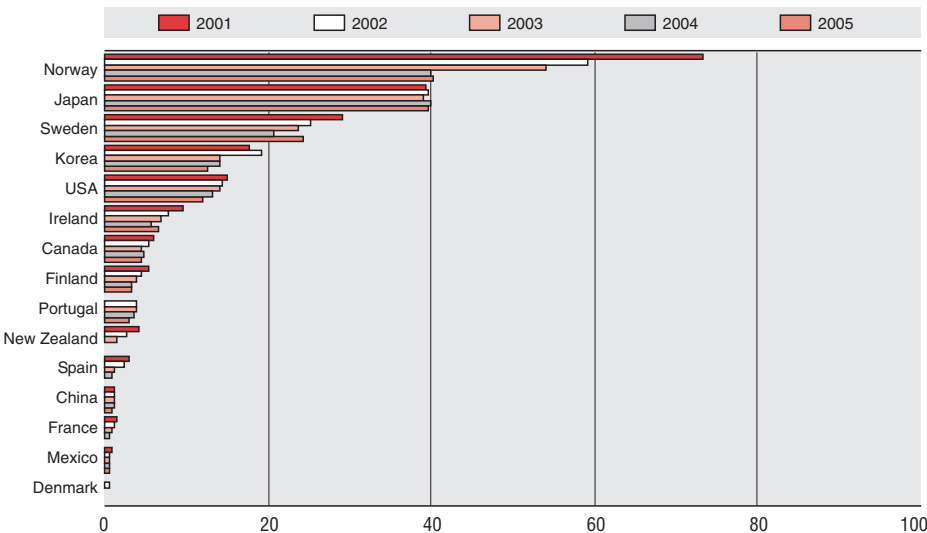
IV. Pension Reserve Funds

A pension reserve fund is an important component of the overall retirement income system in many countries. The main purpose in setting up a pension reserve fund is to smooth the expected rising fiscal burden on the public pay-as-you-go (PAYG) system, given an ageing population.

Over the past five years, pension reserve funds had stable, albeit low growth across countries. The only exception in 2005 was the Norwegian Government Pension Fund – formerly the Petroleum Fund.

Figure 4 shows that the pension reserve fund assets to GDP ratio in Norway increased from 40.2 per cent in 2001 to 73.4 per cent in 2005. The five countries with the largest pension reserve funds relative to GDP in 2005 were Norway (73.4 per cent), Japan (39.3 per cent), Sweden (29 per cent), Korea (17.6 per cent) and the United States (14.9 per cent). In the remaining 10 countries, the pension reserve funds accounted for less than 10 per cent of the GDP. Of these 15 countries, the United States created a Social Security Trust Fund in 1940; Portugal did the same in 1989, while both New Zealand and China set up a pen-

Figure 4. Pension reserve funds for selected OECD and non-OECD member countries, 2001-2005
In per cent of GDP



Source: OECD Global Pension Statistics, various sources.

sion reserve fund more recently, in 2001. Most other countries set up a pension reserve fund in between these dates, particularly towards the end of the 1990s, for example, Canada in 1997, France in 1999 and Korea in 1998.

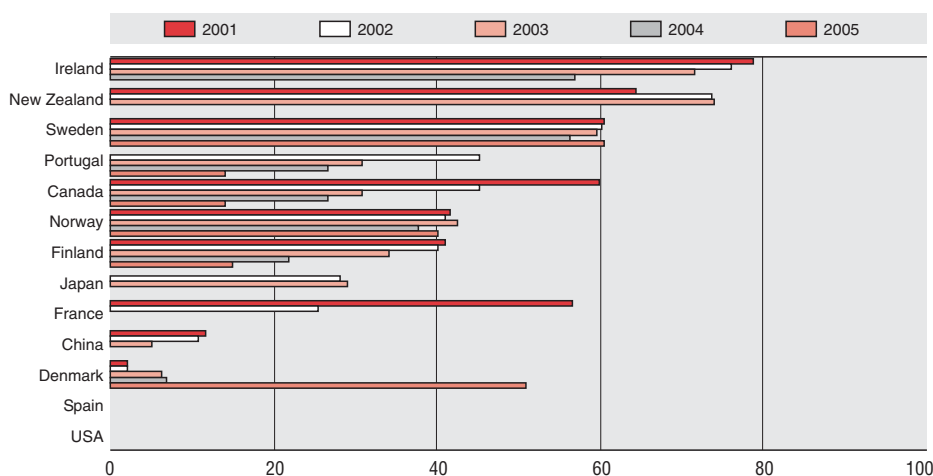
In terms of asset allocation, Figure 5a shows that a significant share of the pension reserve funds were in equities, *i.e.* Ireland (78.7 per cent) and Portugal (45.2 per cent) in 2004, New Zealand (64.5 per cent), Sweden (60.5 per cent), Canada (59.8 per cent) and Finland (41 per cent) in 2005. The share allocated to equities increased most significantly in France, from 25.5 per cent in 2004 to 56.5 per cent in 2005. Figure 5b shows the proportion of pension reserve fund assets invested in bonds.

It is interesting to note that all pension reserve fund assets were exclusively invested in bonds in the United States and Spain, and many other countries also had heavy bond allocations as shown in Figure 5b. For example, in 2005, the Finnish pension reserve fund had 59 per cent of its assets in bonds, while this figure was 58.4 per cent for Norway and 62.8 per cent for China.

Over the five-year period 2001-2005, pension reserve funds in Canada, Finland, France, Ireland and Portugal invested more assets in equities, while asset allocation to equities remained relatively unchanged in other countries, except Denmark,

Figure 5a. **Pension reserve funds, equity investment for selected OECD and non-OECD member countries, 2001-2005**

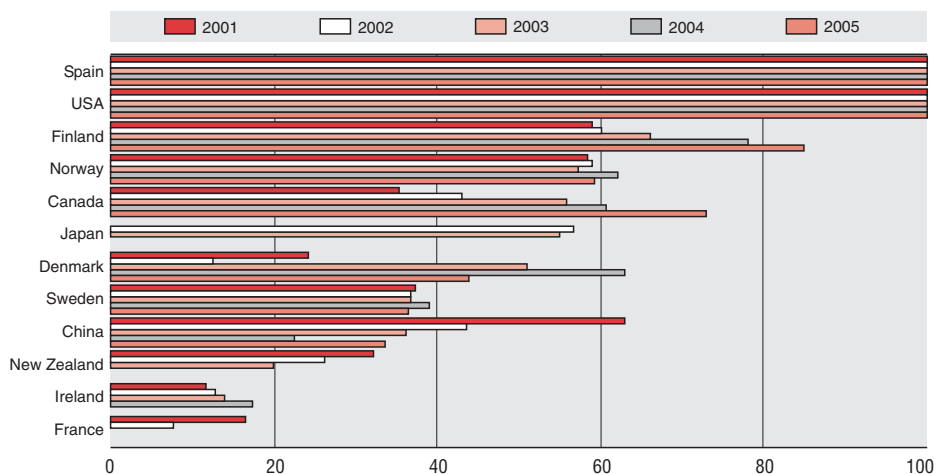
In per cent of total assets



Source: OECD Global Pension Statistics, various sources.

Figure 5b. **Pension reserve funds, bond investment for selected OECD and non-OECD member countries, 2001-2005**

In per cent of total assets



Source: OECD Global Pension Statistics, various sources.

where there was a statistical re-definition. Concerning bond investment, China and New Zealand invested more pension reserve fund assets in bonds over these years, while Finland, Canada and Ireland reduced their bond allocations.

V. The OECD Classification

The development of a common language has been the foundation for the OECD Working Party on Private Pensions' development of international standards for private pension regulation. This development has also been critical in the OECD's statistical data collection process that has been developed by the Working Party and its Task Force on Pension Statistics. This classification is structured around two key terms (pension plans and pension funds) and two approaches (functional and institutional). These approaches are consistent with IASB's international accounting standards.

Based on the OECD classification, there are three main types of funded private pension plans, pension funds (autonomous), book reserves (non-autonomous) and pension insurance contracts, as well as a residual category, *i.e.* others – any other types not included above. The dimension against which those plans are differentiated is the financing vehicle (see Box 3 for details).

Box 3. **OECD classification of pension plans by financing vehicles****FINANCING TYPES**

Pension funds (autonomous)	The pool of assets forming an independent legal entity that are bought with the contributions to a pension plan for the exclusive purpose of financing pension plan benefits. The plan/fund members have a legal or beneficial right or some other contractual claim against the assets of the pension fund. Pension funds take the form of either a special purpose entity with legal personality (such as a trust, foundation, or corporate entity) or a legally separated fund without legal personality managed by a dedicated provider (pension fund management company) or other financial institution on behalf of the plan/fund members.
Book reserves (non-autonomous)	Book reserves are sums entered in the balance sheet of the plan sponsor as reserves or provisions for pension benefits. Some assets may be held in separate accounts for the purpose of financing benefits, but are not legally or contractually pension plan assets.
Pension insurance contracts	An insurance contract that specifies pension plan contributions to an insurance undertaking in exchange for which the pension plan benefits will be paid when the members reach a specified retirement age or on earlier exit of members from the plan.
Other	Other type of financing vehicle not included in the above categories.

PENSION PLAN TYPES

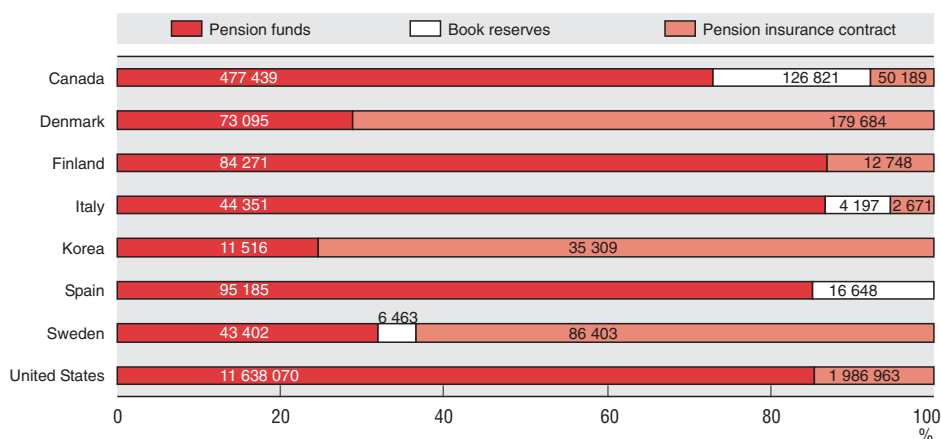
Occupational pension plans	Access to such plans is linked to an employment or professional relationship between the plan member and the entity that establishes the plan (the plan sponsor). Occupational plans may be established by employers or groups thereof (<i>e.g.</i> industry associations) and labour or professional associations, jointly or separately. The plan may be administered directly by the plan sponsor or by an independent entity (a pension fund or a financial institution acting as pension provider). In the latter case, the plan sponsor may still have oversight responsibilities over the operation of the plan.
Personal pension plans	Access to these plans does not have to be linked to an employment relationship. The plans are established and administered directly by a pension fund or a financial institution acting as pension provider without any intervention of employers. Individuals independently purchase and select material aspects of the arrangements. The employer may nonetheless make contributions to personal pension plans. Some personal plans may have restricted membership.
Defined benefit	Occupational plans other than defined contributions plans. DB plans generally can be classified into one of three main types, "traditional", "mixed" and "hybrid" plans. "Traditional" DB plan: a DB plan where benefits are linked through a formula to the members' wages or salaries, length of employment, or other factors.

Box 3. **OECD classification of pension plans by financing vehicles** (cont.)

	"Hybrid" DB plan: a DB plan where benefits depend on a rate of return credited to contributions, where this rate of return is either specified in the plan rules, independently of the actual return on any supporting assets (<i>e.g.</i> fixed, indexed to a market benchmark, tied to salary or profit growth, etc.), or is calculated with reference to the actual return of any supporting assets and a minimum return guarantee specified in the plan rules. "Mixed" DB plans: A DB plan that has two separate DB and DC components but which are treated as part of the same plan.
Defined contribution (protected)	A personal pension plan or occupational defined contribution pension plan other than an unprotected pension plan. The guarantees or promises may be offered by the pension plan/fund itself or the plan provider (<i>e.g.</i> deferred annuity, guaranteed rate of return).
Defined contribution (unprotected), total	A personal pension plan or occupational defined contribution pension plan where the pension plan/fund itself or the pension provider does not offer any investment return or benefit guarantees or promises covering the whole plan/fund.

Source: Private Pensions: OECD Classification and Glossary. The classification is available at www.oecd.org/data/pensions/.

Figure 6. **Private pension plan assets by type of financing vehicles, 2004**
In millions of USD and as a share of total



Source: OECD Global Pension Statistics

Figure 6 presents breakdown statistics of assets by these three types for eight OECD countries in 2004. Heterogeneity is observable across countries. For example, pension funds in Canada, Finland, Italy, Spain and the United States accounted for most of total assets, while pension insurance contracts accounted for most of the total assets in Denmark, Korea and Sweden. In all countries, book reserves played a less significant role in terms of accumulating private pension assets. Specifically, as of 2004, Canada accumulated USD 477.4 billion in pension funds, USD 126.8 billion in book reserves and USD 50.2 billion in pension insurance contract. In Sweden, these three figures were USD 43.4 billion, USD 6.5 billion and USD 86.4 billion, respectively.

Table 5. Pension fund assets in OECD and selected non-OECD countries, 2001-2005

OECD Countries	Total investments of pension funds					Total investments of pension funds				
	Millions of USD					Millions of national currency				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Australia	212 860	239 290	295 670	337 379	409 372	411 964	440 607	455 788	458 577	537 416
Austria	7 555	8 099	10 869	13 299	14 291	8 436	8 594	9 621	10 704	11 499
Belgium	12 639	12 428	12 152	14 508	15 430	14 113	13 187	10 756	11 677	12 415
Canada	375 565	346 341	445 761	477 439	569 216	581 527	543 770	624 225	621 192	689 723
Czech Republic	1 404	2 053	2 852	3 884	5 022	53 377	67 206	80 223	99 803	120 297
Denmark	43 639	44 324	58 782	73 095	87 032	363 115	349 460	386 609	437 660	521 852
Finland (1)	9 991	10 606	13 406	84 271	127 691	11 157	11 254	11 866	67 826	102 743
France	51 388	95 395	123 255	123 624	123 660	57 381	101 220	109 697	99 500	99 500
Germany	65 147	70 470	88 887	104 161	107 856	72 745	74 773	78 679	83 835	86 784
Greece	—	—	—	—	—	—	—	—	—	—
Hungary	2 071	2 976	4 397	6 989	9 338	593 448	766 130	986 276	1 415 969	1 863 189
Iceland	6 636	7 481	10 781	14 103	19 517	648 140	685 107	826 837	989 939	989 939
Ireland (2)	45 763	42 222	59 989	77 405	96 856	51 100	44 800	53 100	62 300	77 933
Italy	25 194	28 312	36 787	44 351	49 520	28 132	30 041	32 562	35 696	39 845
Japan (3)	580 519	561 645	658 255	710 048	864 707	70 523 704	70 348 819	76 315 700	76 789 529	95 201 699
Korea	..	8 438	9 884	11 516	14 652	..	10 556 819	11 771 111	13 188 395	15 007 017
Luxembourg	..	..	..	116	131	..	..	..	93	105
Mexico	26 600	33 643	37 213	42 718	55 095	248 558	325 008	401 536	481 897	599 965
Netherlands	411 460	374 875	545 239	659 839	779 843	459 446	397 767	482 623	531 077	627 481
New Zealand	7 687	7 865	9 094	11 157	12 446	18 308	17 015	15 673	16 836	17 683
Norway	6 831	7 652	10 227	16 939	20 266	61 427	61 107	72 383	114 161	130 541
Poland	4 622	7 588	11 487	17 022	26 325	18 936	30 973	44 665	62 144	85 135
Portugal	13 278	14 657	18 396	18 868	23 591	14 826	15 552	16 284	15 186	18 982
Slovak Republic (4)	0	0	7	7	291	0	0	272	..	9 038
Spain (5)	35 072	39 061	54 778	95 185	112 207	39 162	41 447	48 487	76 610	90 284
Sweden (6)	18 254	18 542	23 457	43 402	51 716	188 720	180 252	189 494	318 831	386 444
Switzerland	261 357	267 554	334 829	389 497	428 634	440 898	416 517	450 281	484 044	535 000
Turkey	..	..	..	209	919	..	..	..	298	1 232
United Kingdom (7)	1 040 472	1 040 472	1 175 335	1 467 118	1 541 100	722 391	..	719 638	800 692	847 785
United States	9 696 193	8 764 040	10 507 392	11 638 070	12 348 250	9 696 193	8 764 040	10 507 392	11 638 070	12 348 250
Total OECD	12 962 197	12 056 030	14 559 182	16 496 220	17 914 971					

Table 5. Pension fund assets in OECD and selected non-OECD countries, 2001-2005 (cont.)

OECD Countries	Total investments of pension funds					Total investments of pension funds				
	Millions of USD					Millions of national currency				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
<i>Regional Indicators</i>										
Total G10	12 538 188	11 580 074	13 951 349	15 672 057	16 879 932					
Euro area	677 486	696 125	963 758	1 235 626	1 451 074					
<i>Memorandum:</i>										
<i>non-OECD countries</i>										
Brazil	..	..	64 444	..	..	..	..	186 140	..	..
Bulgaria	83	173	331	553	776	183	326	513	794	1 117
Colombia	4 939	5 472	7 315	10 965	15 167	11 365 880	15 675 986	20 341 995	26 447 502	36 582 057
Estonia	..	15	90	234	449	..	227	1 116	2 684	5 145
Indonesia	..	278	..	..	..	..	2 486	..	..	..
Israel	28 624	27 877	30 381	33 076	..	120 509	132 138	138 234	148 180	..
Slovenia	20	83	147	597	879	5 043	18 435	27 781	105 256	154 911
South Africa	..	..	57 337	82 756	..	..	..	380 718	465 915	..
Thailand	..	5 774	7 183	7 637	8 984	..	249 157	287 320	305 480	345 884

Source: OECD, Global Pension Statistics.

NOTES

Considerations when interpreting the data

Data includes pension funds as per the OECD classification (Private Pensions: OECD Classification and Glossary. The Glossary is available at www.oecd.org/daf/pensions/).

All types of plans are included (occupational and personal, mandatory and voluntary) covering both public and private sector workers.

General notes

- Method of valuation: book value.
- G10 includes Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom and the United States.
- Euro Area includes 12 countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain.
- OECD countries exchange rates to Euro used: 1.12 in 2001; 1.06 in 2002; .89 in 2003; .80 in 2004 and 2005.
- All OECD countries exchange rates from OECD, Main Economic Indicators.
- Non-OECD countries' exchange rates and GDP data from the International Financial Statistics Yearbook, IMF.
- 2005 Data for Switzerland and the Netherlands are preliminary data.
- Data for Greece are close to zero.
- Conventional signs: "n.a", not applicable; ". . .", not available, "_" close to zero.
- Erratum for Slovakia: units have been adjusted for this issue as compared to the 2nd edition of *Pension Markets in Focus* where data appeared in thousands.

Specific notes

Figure 1:

1. Pension reserve fund data are 2004 data.
2. Life insurance data are 2003 data.

Note: Unallocated pension insurance contracts are excluded from pension funds' assets.

Table 1, Table 5 and Figure 2:

1. Data for 2004 and 2005 include the statutory pension funds.
2. Source: Irish Association of Pension Funds.
3. Data do not include Mutual Aid Trusts; 2004 and 2005 data are estimates.
4. 2004 pension assets data is 2003.
5. Data for 2004 and 2005 include Mutual Funds.
6. Includes assets from the premium pension system for 2004 and 2005. 2005 data are estimates.
7. 2005 pension assets data is staff estimates; 2002 pension assets data is 2001.

Weighted total averages used for Tables 1, 5 and Figure 2 using weights of pension fund assets.

Table 2:

1. Only includes data accounting for pensionskassen.

Table 3:

1. Other investments include value of buildings (not for investment purpose), accounts receivable, provisions for liabilities covered by reinsurance, as well as accrued income and deferred expenses.
2. Private Investment funds: of which 82.3 per cent Hedge Funds and 17.7 per cent Private Equity Funds.
3. Other investments include Mortgage bonds.
4. Other investments include assets of affiliated companies (with a 100 percent holding) holding land and buildings.
5. Other investments include short term payable and receivable accounts.
6. Data are estimates; Private investment funds: of which 80.3 per cent Hedge Funds and 19.7 per cent Private Equity Funds.
7. Other investments include "reverse repo" investments.
8. 2004 data.

9. Other investments include security repurchase agreements, commercial paper, payments receivable and other miscellaneous investments.

10. 2003 data.

Figure 4, 5A and 5B:

- For Finland, pension trusts that are providing supplementary pension benefits as well as benefits belonging to the compulsory social security are treated as pension funds as per the OECD classification, not as a pension reserve fund.
- For Denmark, the fund of the Labour Market Supplementary Pension Scheme (ATP) is treated as a pension fund, not as a pension fund reserve as per the OECD classification.

List of administrative sources used under the OECD GPS project

OECD countries	Statistical source(s) by country
Australia	Australian Prudential Regulation Authority
Austria	FMA Financial Market Authority
Belgium	Commission Bancaire, Financière et des Assurances
Canada	Statistics Canada
Czech Republic	Ministry of Finance
Denmark	Danish Financial Supervisory Authority
Finland	Insurance Supervision Authority
France	Ministry of Finance
Germany	Federal Financial Supervisory Authority
Greece	Ministry of Employment and Social Protection
Hungary	Hungarian Financial Supervisory Authority
Iceland	Financial Supervisory Authority
Italy	Commissione vigilanza fondi pensione (COVIP)
Ireland	Irish Association of Pension Funds
Japan	Ministry of Finance
Korea	Korea Life Insurance Association
Luxembourg	Commissariat aux Assurances
Mexico	Comisión Nacional del Sistema de Ahorro para el Retiro (CONSAR)
Netherlands	Statistics Netherlands
New Zealand	Ministry of Economic Development
Norway	Kredittilsynet
Poland	Insurance and Pension Funds Supervisory Commission of Poland
Portugal	Instituto de Seguros de Portugal
Spain	Banco de España
Spain ¹	Ministry of Economy
Slovak Republic	Ministry of Finance of the Slovak Republic
Switzerland	Office fédéral de la statistique
Sweden	Finansinspektionen (the Swedish Financial Supervisory Authority)
Turkey	Directorate general of Insurance, Department for Private Pensions
United Kingdom	National Statistical Office (ONS)
United States	Department of the Treasury
United States	Federal Reserve

Non-OECD members	Statistical source(s) by country
Argentina	International Federation of Pension Funds Administrators
Bolivia	International Federation of Pension Funds Administrators
Brazil	Ministry of Finance – SUSEP (Open-funds)
Brazil	Ministry of Social Security (Closed-funds)
Bulgaria	Financial Supervision Commission
Chile	International Federation of Pension Funds Administrators
Colombia	Superintendencia Bancaria de Colombia
Costa Rica	International Federation of Pension Funds Administrators
El Salvador	International Federation of Pension Funds Administrators
Estonia	Financial Supervision Authority
Hong Kong, China	Mandatory Provident Fund Schemes Authority
Indonesia	Ministry of Finance of the Republic of Indonesia
Kazakhstan	International Federation of Pension Funds Administrators
Peru	International Federation of Pension Funds Administrators
Singapore	Monetary Authority of Singapore
Slovenia	Slovene Insurance Supervision Agency
Slovenia	Slovene Security Market Agency
South Africa	Financial Services Board
Thailand	Securities and Exchange Commission
Uruguay	International Federation of Pension Funds Administrators

1. Data coming from a secondary source was used to estimate investments by mutual pension entities.

Source: OECD Global Pension Statistics.

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