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Interest Rate Strategy

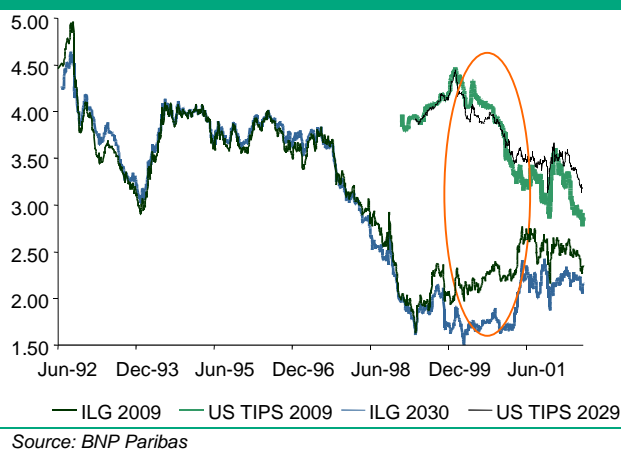
- In this desknote we investigate the main determinants of the inflation linked bonds rates and curve in the US, UK and Europe.
- In the first section we focus on modelling 2009 real rates. The second section then concentrates on the modelling of the real rate curve (i.e. the 10y/30y IL bond spread).
- Two main drivers should trigger an out-performance of IL bonds versus nominal over the coming months.

In this desknote we investigate the key determinants of quoted Inflation linked bond real rates and the real rate curve. **In order to have a global view of the interaction and characteristics of different IL bond markets and curves, we studied US Tips, IL Gilts and OATi curves (the lack of data for the OATeI obliged us to focus on the OATi).** In order to gauge the impact of each key variable, we adopted a quantitative approach. **This desknote is split into three sections: the first section covers the modelling of the 2009 real rate of the three different markets and the second deals with the modelling of the 10-year/30-year real rate curve and its relationship with the nominal curve.** Finally, the last section focuses on the position versus fair values and the outlook of real rates and curves.

Methodology

Several periods were investigated with the longest one for the 2009 IL Gilt real rate (Feb 1993 to July 2002) and the shortest one for the 2009/2029 OATi spread (June 2000 to June 2002) on a daily basis. It is worth noting that the aim of the study is not to provide a long-run equilibrium level of real rates, but to concentrate on the short-run dynamics of real rates and real rate spreads. This is the reason why the real rate modelling is conducted on the one-month change and curve modelling on the two-month variation.

Before working on different econometric models, we initially followed a three-step approach. First, we studied the stationarity of the series; the most robust models are obtained using stationary series. In the current case, we had to work on the change in real rates and spreads to obtain stationary series.

Chart 1: 2009, 2029 TIPS & IL Gilt Real Rates


Source: BNP Paribas

Table 1: Correlation Results for 2009 TIPS*

IL Gilt 2009	0.22	6m/2y swaption	0.36
2007 US Tips	0.97	6m/10y swaption	0.37
2029 US Tips	0.77	Vix	-0.26
US 2y yield	0.68	2y Cap	-0.41
US 10y yield	0.66	5y Cap	-0.37
US 30y yield	0.56	10y Cap	-0.29
2009 Note yield	0.70	3m USD Libor	0.01
2-/10y cash spread	-0.15	6m USD Libor	0.04
2-/10y swap spread	-0.11	12m USD Libor	0.05
2-/30y cash spread	-0.33	3m/6m spread	0.07
		6m/12m spread	0.00

Source: BNP Paribas

Table 2: Correlation Results for 2009 IL Gilts*

2009 US Tips	0.21	6m/2y swaption	0.25
2007 US Tips	0.16	6m/10y swaption	0.22
2029 US Tips	0.39	Vix	0.07
UK 2y yield	0.42	2y Cap	0.03
UK 10y yield	0.55	5y Cap	0.01
UK 30y yield	0.62	10y Cap	-0.02
2009 Gilt yield	0.54	3m GBP Libor	0.13
2-/10y cash spread	0.16	6m GBP Libor	0.24
2-/10y swap spread	0.52	12m GBP Libor	0.30
2-/30y cash spread	0.14	3m/6m spread	0.22
		6m/12m spread	0.32

Source: BNP Paribas

* a correlation is considered as significant if the absolute level is above 0.20. The correlation are done on the 1-month variation for Tables 1, 2 and 3.

The second step regards the investigation of correlation (see Tables 1, 2, 3, 7, 8 and 9), where a correlation is presumed significant when the absolute level exceeds 0.20. Finally, as a significant correlation does not imply a causality, we tested for causality between real rates and other series using Granger causality tests. **At the end of these three steps we retained a limited number of variables for the modelling work. These variables fulfil the following criteria: they have a significant correlation (i.e. above 20% in absolute terms) and have a high probability of determining the change of the real rate or curve (i.e. above 80%).**

Three kinds of financial series were tested: money market rates and spreads (which measure market expectations about central bank policy), nominal curve spreads, and finally, implied and normal volatility on stocks indices and interest rates. With regards to interest rates, we focused on 2, 5 and 10-year cap vol and domestic 6-month/2-year and 6-month/10-year swaption vol.

Section 1: real rate variation modelling results

In order to deal with the same 10-year maturity, we choose 2009 Jan Tips, 2009 May IL Gilt and July 2009 OATi paper. Before explaining each model in more detail, it is worth highlighting the common points between each IL market in terms of correlation results (see Tables 1 to 3).

First, **it is worth noting that IL Gilts and OATi real rates were positively correlated to domestic libor rates which was intuitively expected.** Indeed, lower risk free rates mean a higher profit of carry on IL bonds which warrants lower real rates. In addition, during periods of business activity recovery - consistent with higher short-term rates - the growing imbalance between savings and investment warrants a rise in the real rate required by investors. In contrast, **there was no clear stable link between the 2009 US Tips rate and USD Libor rates until July 2002, even before the Fed aggressive easing monetary policy. To some extent, the historical cheapness of US Tips since their issuance can explain this lack of correlation.** The 2009 US Tips / OATi spread has been in positive territory until recently while US inflation has, on average, been around 1.2% above the French inflation rate over the past five years.

Regarding nominal yield curve spreads and 2009 real rates, there is no significant relationship for the three markets. It is worth noting also **that the correlation between 2009 US Tips and 2009 IL Gilts is significant but close to the key 20% threshold.**

Chart 1 clearly illustrates the weak correlation between US Tips and IL Gilts during some periods such as 2000. Finally, as for the volatility series, **the results on swaption volatilities are quite**

Table 3: Correlation Results for OATi 2009

2009 US Tips	0.54	6m/2y swaption	0.34
2009 IL Gilt	0.34	6m/10y swaption	0.20
2009 Note yield	0.69	2y Cap	0.40
3m Euribor	0.33	5y Cap	0.40
6m Euribor	0.46	10y Cap	0.37
12m Euribor	0.55	CAC Impl Vol	-0.16
3m/6m spread	0.27	Bund Impl Vol	0.52
6m/12m spread	0.39	Euribor Impl Vol	0.41
2-/10y swap spread	-0.10		

Source: BNP Paribas

Table 4: 2009 US Tips Modelling**

Series	Coefficient	T-statistics*
2009 Nominal rate	0.11	3.97
US 2y yield	0.24	10.46
6m/10y Swaption Normal Vol	0.42	9.42

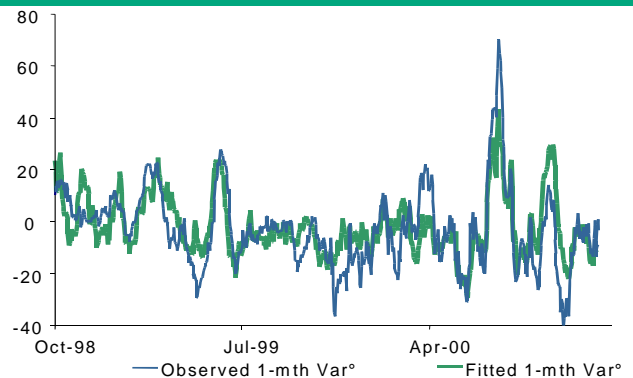
Adjusted R²: 56.2%, Standard Deviation: 9.9bp

Number of observations: 795, Period: 6/15/1999 to 7/1/2002

** the impact of the series is considered as different from 0 with a probability of 95% when the t-statistics is above 1.96 in absolute term.

Source: BNP Paribas

Chart 2: 2009 US Tips Observed & Fitted



Source: BNP Paribas

Table 5: 2009 IL Gilt Modelling

Series	Coefficient	T-statistics
Long-run dynamics		
UK 2y yield	20.04	4.30
Intercept	-127.70	29.20
Short-run dynamics		
Lagged Real rate	-0.06	-3.88
UK 2y yield	0.33	31.05
6m/2y swaption	0.09	3.52
2-/10y cash spread	0.39	29.2

Adjusted R²: 49.8%, Standard Deviation: 10.1bp

Number of observations: 2446, Period: 2/16/1993 to 7/2/2002

Source: BNP Paribas

homogeneous for the three markets with a positive correlation which is not the case for cap implied vol. For the latter, correlation levels were positive for OATi bonds, non significant for IL Gilts and significantly negative for US Tips. An explanation of this positive link between swaption volatility and real rates could be that, during periods of a flight to quality - characterised by a surge on interest rate vol and a marked decline in the inflation break-even (IBE) – the reactivity of real rates tends to be lower. To some extent, during periods of a flight to quality, the negative impact of the swaption vol offsets the positive one of lower nominal rates, which allows us to take into account the notable compression of IBE. Hence, the non-linear reaction of real rates to nominal rate shocks can be gauged through the presence of a positive link to interest rate normal vol.

As far as stock markets vol is concerned, the link between vol and the three real rates is not clearly demonstrated. The only exception is the Tips market where there is a negative correlation with the VIX.

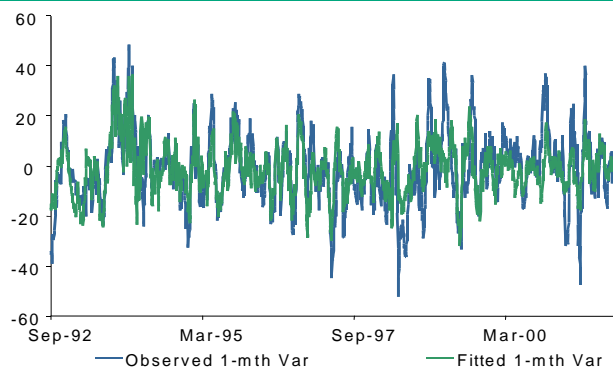
- **2009 US Tips real rate: modelling the 1-month variation**

The estimation period covers June 1999 to July 2002 (almost 800 observations). Table 4 summarises the retained model. **It is worth noting that we tested more complex model specifications, such as ECM (which distinguish between a long and short-run dynamics) or non-constant volatility models, such as ARCH family models. The improvement in the model's performance is quite poor (adjusted R² only rises to 57.6% for an ARCH-M (2,0) compared to 56.2% for the retained model).** The retained model is a three-factor model, which includes 2-year yields (Libor rates are not correlated to real rates, see page 2, section 1), 2009 nominal rates and USD 6-month/10-year swaption vol. **The key feature is that the sensitivity of real rates to 2-year yields is twice the sensitivity to 2009 nominal rates.**

Chart 2 illustrates the observed and fitted one-month change in the 2009 Tips real rate. Even during periods of a marked variation in the real rate, such as September–October 2001, the model managed to fit the observed variation quite well.

- **2009 IL Gilt real rate: modelling the 1-month variation**

The estimation period covers February 1993 to July 2002 (almost 2450 observations). **The model specification is more complex than the US Tips one.** In this case, we retained an Error Correction Model (Table 5) which encompasses two equations: a long-term and a short-term one. **The model's explanatory capacity is lower than that of the US Tips (at around 50%).** However, and as Chart 3 shows, even though the model tends to underestimate the variation of the real rate during

Chart 3: 2009 IL Gilt Observed & Fitted


Source: BNP Paribas

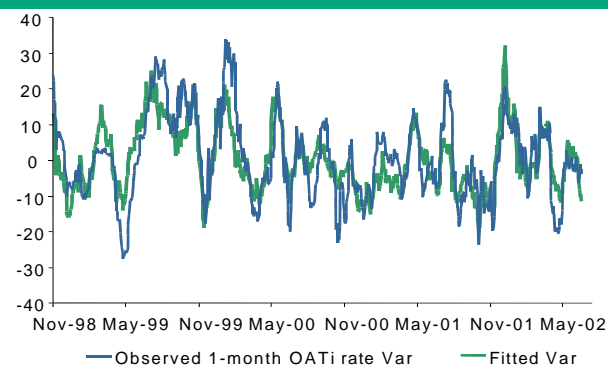
Table 6: 2009 OATi Rate Retained Model

Series	Coefficient	T-statistics*
6m Euribor	0.12	9.55
2009 Nominal rate	0.26	16.4
Eur 6m/2y swaption	0.23	8.79
2009 US Tips	0.20	10.29

Adjusted R²: 61.1%, Standard Deviation: 7.2bp

Nber of observations: 947, Period: 11/4/1998 to 6/20/2002

Source: BNP Paribas

Chart 4: 2009 OATi Observed & Fitted


Source: BNP Paribas

Table 7: Correlation Results for Tips 2009/29

Nominal spread	0.61	6m/2y swaption	-0.29
IL Gilt 2009/2030	0.54	6m/10y swaption	-0.37
2009 US Tips	-0.79	Vix	0.42
US 2y yield	-0.48	2y Cap	0.29
US 10y yield	-0.35	5y Cap	0.26
2-/10y cash spread	0.35	10y Cap	0.11
2-/30y cash spread	0.56	3m/6m spread	-0.10
3m US Libor	0.03	6m/12m spread	-0.24
6m US Libor	-0.01	12m US Libor	-0.08

Source: BNP Paribas

periods of high volatility, the model gives the right direction of the change. In terms of variables, once again the 2-year Gilt rate is one of the key determinants with the shape of the curve (i.e. 2-/10-year cash spread). There is also a **slight mean reverting process with the presence of the 1-month lagged 2009 real rate variation**. In addition, and like the US Tips model, the **interest rate volatility is also a key determinant (here through the 6-month/2-year swaption vol)**.

- **2009 OATi real rate: modelling the 1-month variation**

As suggested on page one, we assumed that the OATei behaves as the OATi and conducted the modelling on the OATi rate and curve. In the long run, the convergence of the two inflation rates (the differential has been limited over the past 5 years) is a strong argument supporting the hypothesis of a similar reaction of the OATei rate to the OATi to volatility and interest rates.

The estimation period covers November 1998 to June 2002 (almost 947 observations). **The model's performance is the best one with an adjusted R² of 61.1%**. Table 6 gives the retained model: it is a **four-factor model quite close to the US Tips one**, where the 2009 US Tips rate is one of the key determinants (see Chart 4 for the observed and fitted real rate). However, **there are some notable differences regarding the sensitivity to rates and volatility:**

- First, the combined sensitivity of the OATi real rate to Euribor and 2009 nominal rates (i.e. 0.12 and 0.26) is close to the 0.40/0.45 sensitivity level commonly evoked by market participants to nominal rates. It also means that, for **market makers or pre-active investors, hedging long OATi or OATie with OATs alone is quite risky during Central Bank tightening cycles and yield curve flattening periods**.

- Second, **OATi and OATei real rates are rather sensitive to the very front end of the money market curve (6-mth Euribor)**. US Tips are sensitive to market expectations regarding the medium-term Central bank's monetary policy. In addition, the impact is half that for OATi than for US Tips while the volatility of the 2y is 1.5 times higher.

- Finally, **the sensitivity to swaptions vol (normal) is much higher for US Tips than for OATi**: 0.42bp rise for 1bp rise in the US compared to 0.23. It is also worth noting that the retained swaption vol is the 6-month/10-year for the US and 6-month/2-year for the OATi.

Section 2: real rate curve modelling results

After modelling the 1-month change of the IL bond real rate, we decided to study the behaviour of the

Table 8: Correlation Results for IL Gilt 2009/29

Nominal spread	0.41	6m/2y swaption	0.06
US Tips 2009/2029	0.49	6m/10y swaption	0.02
2009 IL Gilt	-0.19	Vix	0.30
UK 2y yield	-0.38	2y Cap	0.25
UK 10y yield	-0.02	5y Cap	0.23
UK 30y yield	0.23	10y Cap	0.09
2-/10y cash spread	0.54	3m/6m spread	-0.23
2-/30y cash spread	0.59	6m/12m spread	-0.26
3m US Libor	-0.32	12m US Libor	-0.40
6m US Libor	-0.40		

Source: BNP Paribas

Table 9: Correlation Results for OATi 2009/29

Nominal spread	0.62	6m/2y swaption	0.01
US Tips 2009/2029	0.58	6m/5y swaption	-0.06
2009 IL Gilt	0.30	6m/10y swaption	0.02
3m Euribor	-0.23	Vix	0.33
6m Euribor	-0.32	5y Cap	0.49
12m Euribor	-0.44	10y Cap	0.45
3m/6m spread	-0.41		
6m/12m spread	-0.50	Eur 2y yield	-0.17
2-/10y cash spread	0.32	Eur 10y yield	0.04

Source: BNP Paribas

Table 10: 2009/29 US Tips spd Retained Model

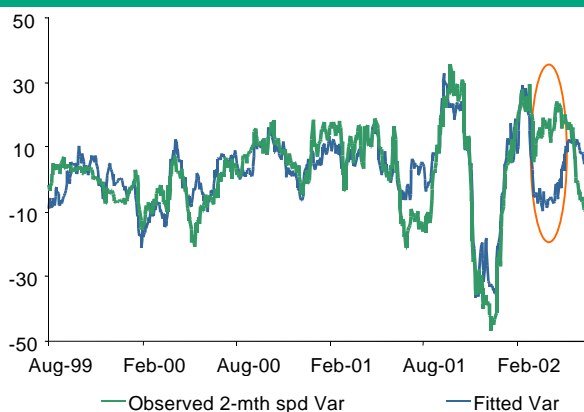
Series	Coefficient	T-statistics
2-/30y cash spread	0.23	39.08
6m/10y swaption	-0.47	-17.74
Lagged TIP spread	-0.19	-6.05
Vix	0.36	9.11

Adjusted R²: 63.1%, Standard Deviation: 8.5bp

Nber of observations: 754

Period: 8/11/1999 to 7/01/2002

Source: BNP Paribas

Chart 5: Observed & Fitted 2009/29 Tips spd


Source: BNP Paribas

real rate curve in the three markets and its characteristics. For this purpose, **we tried to determine the key determinants of the 2-month change in 10-year/30-year real rate spreads. To get homogeneous data, we used the 2009 / 2029 spread (except for IL Gilt spread where it is the 2009 / 2030 spread) as a proxy.**

Tables 7 to 9 summarise the correlation levels between the 2009/2029 IL bond spread and series such as money market rates, nominal curve spreads and volatilities. Not surprisingly, there is a negative link between the real rate curve and Libor rates for IL Gilts and OATi. **By contrast to 2009 real rates, the link with swaption vol is not obvious (except for the US). As for stock markets vol (we used the Vix as a proxy), it is clearly correlated to the real rate curve for all the markets which was not the case for 2009 real rates.**

- **2009/2029 US Tips real rate spread: modelling the 2-month variation**

The retained model is a four factor one (including the lagged Tips spread) and explains almost two thirds of the 2-month spread variation since August 1999. **It is interesting to note that the 2-/30-year spread is one of the key determinants** (contrary to the 2009/2029 Note spread, it clearly improves the model's performance). In terms of the impact, 1bp steepening on the 2-/30-year spread triggers a 0.23bp widening of the Tips spread. Stock market vol is also one of the key variables, **with a 1% rise in the Vix leading to 0.36bp 2009/2029 Tips widening.** In addition, and in contrast to the Tips rate, the swaption vol has a negative impact. Indeed, the 10-/30-year segment has a directional bias in the US, with lower rates triggering convexity hedging on the 10-year and rise in swaption vol, hence the negative coefficient. **1bp rise in the annualised normal vol leads to a 0.47bp compression of the Tips spread.**

As Chart 5 shows, the observed 2009/2029 Tips spread has risen more than its fair value in April 2002 pushing 2029 Tips to cheap levels. This is why the spread has lagged the recent re-steepening of the cash curve.

- **2009/2030 IL Gilt real rate spread: modelling the 2-month variation**

The retained model for the IL Gilt curve is more complex (period studied: July 1997 to July 2002). **It is also a four factor model** (including the lagged IL Gilt spread).

Table 12 shows the model's specification. It appears that there is a non-linear relationship between shocks on the nominal Gilt curve and the IL Gilt one. **More accurately, and as Chart 8 illustrates, the sensitivity of the 2009/2030 IL Gilt spread is linked to the absolute level of the 10-/30-year spread.** With a 10-/30-year Gilt spread between -40 and 0, the

Table 11: IL Gilt 2009/29 spread Retained Model

Series	Coefficient	T-statistics
6m GBP Libor	-0.10	-17.46
Lagged IL Gilt spread	-0.36	-15.75
Vix	-0.06	-9.43
10-/30y cash spread:		
Linear form	-0.02	-9.97
Quadratic form	-0.000286	-6.86
Cubic form	-1.32 10 ⁻⁶	-5.15

Adjusted R²: 49.0%, Standard Deviation: 6.2bp

Period: 1/1/997 to 7/05/2002

Number of observations: 1438

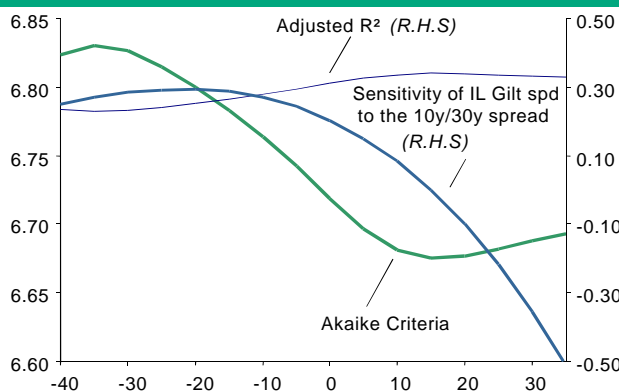
Source: BNP Paribas

Table 12: Retained Non-linear Model Equation

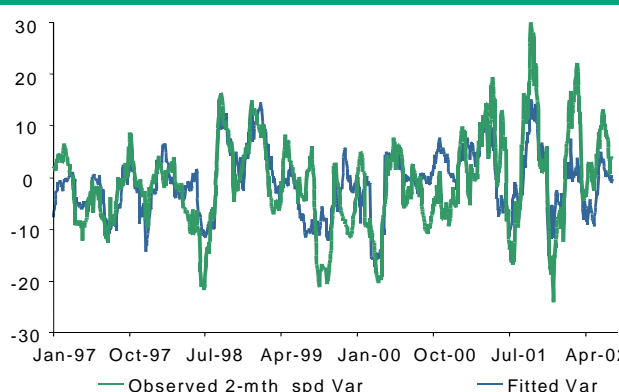
$$\Delta_{44} \text{ Gilti } 2009/30 = \alpha \cdot \Delta_{44} \text{ UK6M} + \beta \cdot \Delta_{44} \text{ Gilti } 2009/30_{(-44)} + \Delta_{44} \text{ 1030UK} \cdot [\chi_1 \cdot (\text{SP1030UK}-15) + \chi_2 \cdot (\text{SP1030UK}-15)^2 + \chi_3 \cdot (\text{SP1030UK}-15)^3] + \phi \cdot \text{Dummy} + \lambda \cdot \text{Vix} + \varepsilon$$

Where Δ_{44} is the 2-month absolute variation, Gilti 2009/30 is the IL Gilt 2009/2030 spread, SP1030UK is the 10-/30-year Gilt cash spread, UK6M is the 6-month GBP Libor rate and Vix is the implied volatility of the S&P 100.

Source: BNP Paribas

Chart 6: Sensitivity of 2009/2030 spd to the 10-/30-year cash spread (threshold effect at 15bp)


Source: BNP Paribas

Chart 7: Observed & Fitted 2009/2030 IL Gilt spd


Source: BNP Paribas

sensitivity of IL Gilt is close to 0.30 but it decreases to become negative above +15bp. In terms of fair value, and as was the case for US Tips, it appears the recent under-performance of 2030 IL Gilt versus the 2009 has been to some extent unwarranted (see Chart 7).

- **2009/2029 OATi real rate spread: modelling the 2-month variation**

Table 13 shows our best model for the 2009/2029 OATi spread. As was the case for the 2009 OATi real rate, **the best model performance is reached for IL OATs with a 67.7% adjusted R²** (period studied: June 2000 – June 2002). **As observed for the IL Gilt spread, we found a non-linear relationship between the 10-/30-year nominal spread and the OATi spread.** The sensitivity is close to 0.30 when the nominal spread is between 30 and 55bp and turns negative for a nominal spread above 75bp.

It is worth noting also that the cap vol, especially the 5-year one, has an impact on the OATi spread with a 1.0% rise triggering a 1.24bp spread widening. As Chart 9 shows, and in the wake of the steepening of the Tips curve, **the OATi spread re-steepened in April/May but the move has been greater than implied by its fair value. Since that period, the 2029 OATi has recovered but is still cheap.**

Section 3: Outlook on IL markets

Two factors should be the main drivers of real rate levels and spreads over the coming months and quarters.

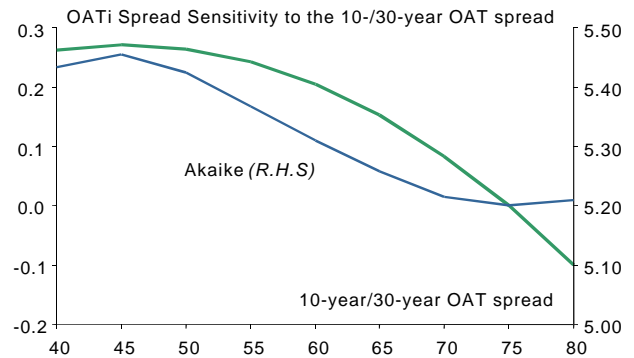
1) A major asset reallocation move from bonds into stocks will favour IL bonds:

While the renewed weakness on stocks since April 2002 has clearly favoured an out-performance of nominal bonds versus indexed linked bonds, we believe that a significant asset reallocation is likely to occur over the coming weeks. As Chart 10 illustrates, and using the Fed model approach, **with the decline in the S&P 500 to the 830 level, and 10-year Note yields close to 4.40%, US stock valuations versus bonds are close to the cheap levels seen in 1987 after the crash and in 1995. In terms of P/E, S&P500 index is also close to the levels seen at the end of the 1991 recession.**

It is worth remembering that stocks provided very high positive returns from these levels, on a 6-month horizon. **A rebound on stocks over the coming weeks from oversold levels, and historically cheap levels relative to bonds, is likely to weigh on nominal bonds and push inflation break-evens higher.**

2) The second factor is more structural and regards European pension funds:

Chart 8: Sensitivity of 2009/2029 OATi spd to the 10-/30-year cash spread (threshold effect at 75bp)



Source: BNP Paribas

Table 13: 2009/29 OATi Spread Retained Model

Series	Coefficient	T-statistics
US Tips 2009/2029	0.08	6.02
Lagged OATi spread	-0.27	-11.00
5y Cap vol	1.24	17.08
10-/30y cash spread	Non-linear: positive below 75pb then negative	-13.3 & -11.7

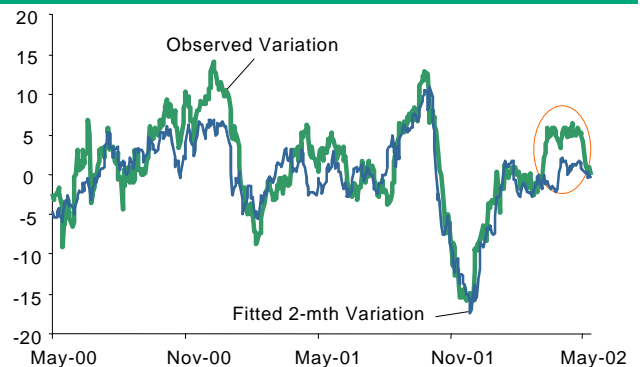
Adjusted R²: 67.7%, Standard Deviation: 3.2bp

Number of observations: 530

Period: 6/02/2000 to 6/13/2002

Source: BNP Paribas

Chart 9: 2009/29 OATi Spread Retained Model



Source: BNP Paribas

Given the ageing of the population and a strong public component in European pension system, growing pressures in favour of a funded system - as already exist in the US and some countries in Europe - should also create a huge demand for inflation linked bonds. The example of the UK, where IL bonds represented 7% of total assets in 2001, is telling. The natural appetite of UK pension funds for equities (roughly 73% of overall assets) could partly explain the interest in IL bonds as the realised volatility of the latter is lower than that of nominal bonds.

In spite of a possible major rebound on stocks in the near term, the demographic variable gradually becomes a long-term negative factor for equities. Assets with low volatility and offering a protection against the scenario of a rise in inflation will be the main beneficiary in the current environment. Indeed, **with inflation at historically low levels in Europe and in the US (since 1965), and accommodative monetary policies in Japan, the US and, to some extent, in Europe, nominal bonds seem exposed to both a future monetary policy tightening and/or a long-run rise in inflation. By contrast, it seems to be the best time to increase the share of IL bonds in portfolios.** With pension funds focusing on the very long-run horizon (i.e. 20 to 30-years) **we believe that demand will mainly concentrate on very long-dated IL bonds which will mean a richening of such paper relative to shorter maturities.**

In Europe, the only market which offers liquidity and a commitment to frequent supply is the IL OAT market as highlighted by Table 15. **In terms of relative value, the 2012 OATei offers the highest rate carry in Europe.** Moreover, a new OATei with a maturity between 15- and 30-years will be launched this autumn to fit the growing demand for long-dated IL bonds in Europe.

In conclusion, we were able to explain **the short-term dynamics of 2009 IL bonds real rates as a combination of three to four factors including rates and swaption volatility (see Table 14).** With regards the real rate curve, European IL bonds (IL Gilt & OATi) react differently to shocks on the nominal 10-/30-year curve: **while for the former there is an asymmetric reaction (it is less and less sensitive with a rise in the 10-/30-year nominal level) for US Tips the link is stable.** It is worth noting also that the 2009/2029 OATi spread is clearly sensitive to 5-year cap volatility while US Tips are sensitive to the swaption vol.

Table 14: IL Bond Market specificities

	US Tips	IL Gilt	OATi
2009 Real rate variation			
Rates	Sensitive to short-term higher than 10y	Sensitive to yield curve	Sensitive to US Tips
Rates	Sensitive to medium-term CB pol expectations	Sensitive to medium-term CB pol expectations	Sensitive to short-term CB pol expectations
Volatility	Sensitive to swaption vol	Sensitive to swaption vol	Sensitive to swaption vol
10-/30-year Real rate spread			
Nominal Curve Spread	Linear link to nominal curve	Non linear link to nominal curve	Non linear link to nominal curve
Volatility	Sensitive to swaption vol		Sensitive to 5y cap vol

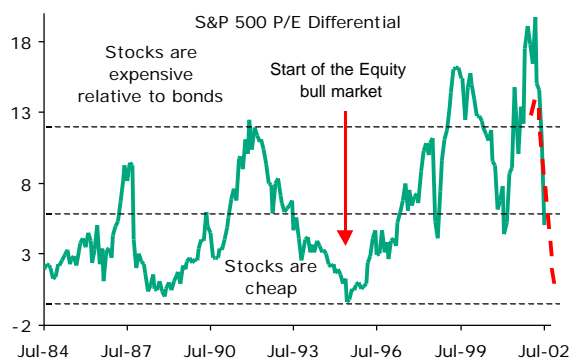
Source: BNP Paribas

Table 15: IL Bond Supply & Debt

	US Tips	IL Gilt	OATi & OATei
2002 Supply	15	2.9	6.3 + new OATei
Market cap	121 *	109	28 + new OATei
Share of outstanding debt	6.5%	25%	4.5%
2012 Rate carry**	2.40%	-0.60%	1.5%

Source: BNP Paribas

* amounts in Bn Euro ** real rate + obs cpi vs 3-mth

Chart 10: US stocks are almost as cheap vs bonds as in 1988 & 1995


Source: BNP Paribas

The red dotted line represents earnings without the negative impact of goodwill write-off.



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