



# French inflation swaps get a price

André Sanchez and Arnaud Bayle of CDC Ixis Capital Markets explain how changing the calculation of the Livret A allows hedging against inflation risk

Until the beginning of this year the French 'Livret A' interest rate on deposits was set by the Comité de Réglementation Bancaire et Financière. However, since August the rate has instead been set using a special formula, which makes it a function of French inflation and the short-term interest rate. This has presented opportunities for banks with the technical expertise to effectively price inflation derivatives. It allows for the hedging of inflation risk, gives the opportunity to establish a barometer for measuring the attractiveness of the Livret A rate against the market, and lets one test the robustness of the new formula.

## Determining the rate

This year the determination of the French Livret A deposit rate has been effectively de-regulated, and we have moved from a position where the rate was fixed without direct and transparent reference to underlying markets to one in which market data can be fed into a formula to compute the semi-annual rate. The un-rounded formula is simple and is a function of both French inflation and the short-dated Euribor interest rate:

$$\text{Rate}_0 = (\text{short-term rate} + \text{inflation})/2 + 0.25\%$$

The short-term rate is the average for one-month period of the three-month Euribor rate; inflation is French inflation excluding tobacco, as published by the INSEE statistics institute. Finally, this rate is rounded to the nearest full quarter point.

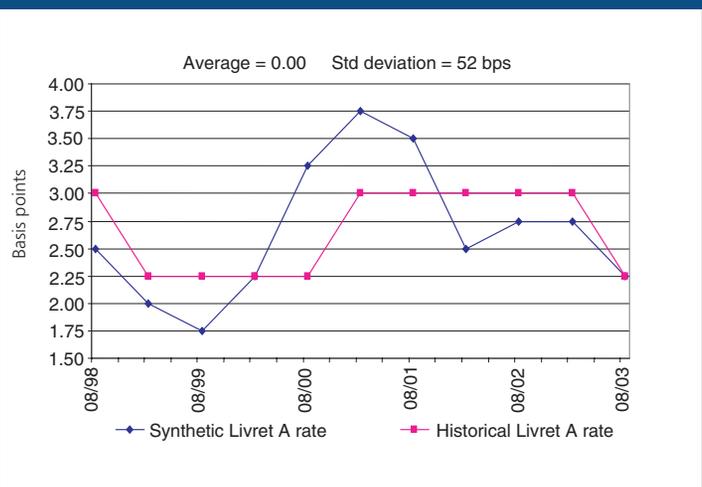
$$\text{Rate} = \text{round}(\text{rate}_0 * 4 ; 0) / 4$$

Note that the Banque de France reserves the right to adjust the formula, on a comparative basis, in the event of exceptional conditions pertaining. However, as this is by definition unlikely, for the purposes of this article we are not taking account of this possibility.

Using figures for the last computation of Livret A that took place on August 4 produces the following result:

Euribor 3M average	= 2.08558%
Inflation	= 109.4/107.2 - 1 = 2.05224%
Livret A rate (not rounded)	= (2.08558 + 2.05224)/2 + 0.25 = 2.31891
Livret A rate (rounded)	= 2.25%

**Graph 1. Comparison of the historical Livret A rate and the synthetic recalculated rate**



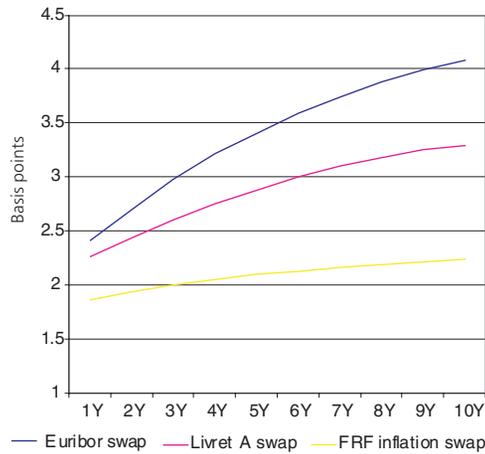
To gain an initial insight into the relevance of the formula, one can compare it with the rate determined by the regulator for the last time in which Livret A was determined this way, on February 4. We find that the February 4 rate is the exact same as that computed on August 4, at 2.25%.

## Robustness

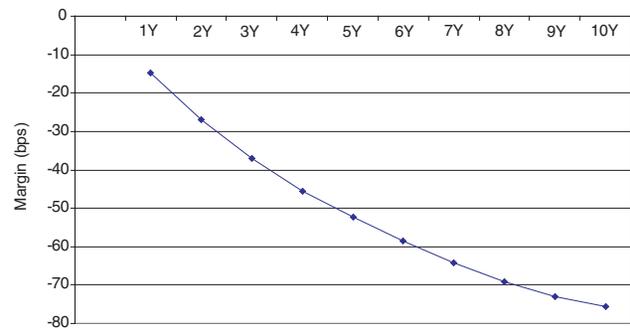
To further test the robustness of the formula it is necessary to apply it retrospectively and compare the results with the rates that were actually set. By taking five years' worth of data and calculating results for each time period we find that the synthetic Livret A rates are on average very close to the actual rates that were set by the regulator. Graph 1 shows the historic real rate versus the synthetic rate using the formula.

The standard deviation expressing the difference between the historical and synthetic rates is limited at 50 basis points, and the results show that the formula is a good proxy for the actual rates over the past five years. Our research shows that market participants indexed on the Livret A rate can be certain that their remuneration is historically robust.

**Graph 2. Anticipation of forward euribor rates, annual inflation rates, and Livret A rates**



**Graph 3. Equivalent margin of Livret A swaps**



## It is now possible to produce a forward curve of French inflation by using data on today's market conditions with estimates on future expectations

Graph three shows French inflation expectations out to 10 years, predictions of the Livret A rate going out to 10 years and predictions of the value of the Euribor short-term rate going out to 10 years. See Graph 3

It should be noted that entering into a Livret A swap does not give the market participant exposure to the absolute levels of the underlying interest rates, or of the French inflation rate. Rather, Livret A swaps create a position on the spread between the short-term interest rates and the French inflation level.

### Conclusion

CDC Ixis Capital markets has worked with a number of leading banks to develop derivatives on French rates of inflation. We have participated with other banks in order to grow this important new market, and now, in under six months, we have moved from a situation where a lot of financial institutions indexed on the Livret A rate had risk exposures on their books that they could not price, to a situation where these risks can now be effectively marked-to-market.

The new system for determining the Livret A rate, combined with the development of the inflation swaps, has allowed CDC Ixis Capital Markets' clients to manage that part of their balance sheet far more effectively. ■

### Equivalent margin of Livret A swaps

Maturity	Margin (bps)
1Y	-14.7
2Y	-26.9
3Y	-36.9
4Y	-45.5
5Y	-52.2
6Y	-58.6
7Y	-64.3
8Y	-69.1
9Y	-73
10Y	-75.7

### Expectations of forward Livret A rates

01-Feb-05	2.25%
01-Aug-05	2.25%
01-Feb-06	2.50%
01-Aug-06	2.75%
01-Feb-07	2.75%
01-Aug-07	3.00%
01-Feb-08	3.00%
01-Aug-08	3.25%
01-Feb-09	3.25%
01-Aug-09	3.50%
01-Feb-10	3.50%
01-Aug-10	3.50%
01-Feb-11	3.75%
01-Aug-11	3.75%
01-Feb-12	3.75%
01-Aug-12	3.75%
01-Feb-13	3.75%
01-Aug-13	4.00%
01-Feb-14	4.00%

### Hedging with swaps

As the short-dated Euribor rate can be hedged in the market, and the inflation part of the formula can also be hedged using inflation swaps, one can see that we are now only one step away from pricing Livret A swaps. CDC Ixis Capital Markets

clients can enter swap transactions whereby in each six-month period the client pays Euribor minus a margin against receiving the number derived from the Livret A formula, or any variation there of. The Euribor margin gives the price of the swap. See Graph 2.

Furthermore, it is now also possible to produce a forward curve of French inflation by using data on today's market conditions and combining it with estimates on future expectations. By mapping out forward prices of the short-term Euribor rate we can deduce prices on one-year, two-year, five-year, 10-year and 15-year inflation swaps, and so on. It is then possible to produce a spreadsheet that compares the payout structures on swaps of varying duration. As expected, the margin increases incrementally as we move from short- to long-dated inflation swaps. The margin for a one-year inflation swap is around -15bp, while for a 10-year swap it goes up to between -70bp and -80bp.

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