



CNO,

Comité de Normalisation Obligataire,  
The French Bond Association

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## CNO analysis of fixed income securities

"Finance theory cannot identify the true boundary between debt and equity... There is nothing more complex than trying to draw a line which does not exist".<sup>1</sup>

*In the past, it used to be easy to differentiate between Debt and Equity. However, over the last years, the issuance of securities mixing the characteristics of these instruments has developed tremendously, leaving many market participants puzzled about the relevance of this taxonomy. According to its by-laws, the CNO, the French Bond Association, aims to "clarify, simplify and harmonise the calculation methodology used in fixed income markets", including bonds and derivatives. However, the CNO itself never gave a proper definition of these "fixed income markets". Its 1997 brochure about « Les Marchés Obligataires du Franc » ("The French Bond Markets"), simply mentions debt instruments bearing a fixed rate or floating rate remuneration. And when selecting the bonds included in a bond index, it only mentions that bonds with a remuneration linked to an equity index are excluded from a bond index. Ultimately, it became apparent that this lack of an explicit definition of fixed income securities was detrimental to market transparency and that it fostered ambiguity regarding the nature of these securities.*

*Thus, in order to inform investors and to complement other market participants' approach (regulators, accountants, lawyers, etc.), the CNO offers an analysis based upon the economic and financial characteristics of fixed income securities.<sup>2</sup>*

*The CNO also takes this opportunity to remind that new bond structured issues, even the most innovative ones, should abide by market conventions. In addition it stresses that fixed-rate securities should bear an explicit fixed or minimum redemption price and that, in any circumstances, bond holders are entitled to the original value of their bonds in the event of liquidation of the issuer, irrespective of whether or not their nominal value had been previously reduced as a result of a loss absorption clause.<sup>3</sup>*

**The issuance of new financial product mixing debt and equity instruments' characteristics or tied to other indices uncorrelated to interest rates has increased considerably over the last years for many reasons:**

- In a low interest-rate environment, investors look for additional sources of return. MTN programs facilitate the issuance of tailor-made instruments indexed, for instance, to the shape of a yield curve, foreign currencies, stocks, credits, commodities or hedge funds' performances.
- Changes in the regulatory environment for banks and in the philosophy of rating agencies have recently triggered the issuance of hybrid capital instruments, treated as debt from legal and fiscal standpoints, but considered as equity by auditors and rating agencies.
- In the euro zone, the coexistence of various domestic laws and the use of common laws have alleviated the documentation burden for new instruments.

**The diversity of debt instruments is causing confusion,** as evidenced by the hesitation of the NAIC, the regulator of US insurance companies, regarding the classification of Hybrid Capital Securities. In a letter dated August 30<sup>th</sup> 2006 sent to the NAIC, the Bond Market Association stressed that over the last 7 years, the qualification of a 8.15% Dresdner Funding Trust issuance had changed three times. Initially, classified as "preferred equity", this issue was a few months later considered as "debt" in the NAIC database. And in 2006, the NAIC "reclassified the Dresdner Security as common equity without explanation". Such uncertainty creates confusion amongst market participants and the classification as equity can be extremely costly for institutional investors, since they have to set aside more capital against these holdings.

**The CNO aims to respond to the increasing need for a stable and transparent taxonomy for new financial instruments.** Pricing these instruments often necessitates sophisticated proprietary models and the CNO does not interfere with these choices. The CNO's objective is more prosaically to:

- Verify the appropriateness between the standards it defines and the evolution of interest rate products, and
- Inform potential users on the applicable pricing conventions and on these instruments' risk profile. This approach is in line with that of European regulators seeking to insure that "their acquisition is consistent with the investment policy... and their risks are adequately captured by the risk management process of the" fund.<sup>4</sup>

**The CNO has noticed that banks often tend to take advantage of the creation of new financial instruments by defining new instrument-specific conventions,** although existing ones could, in most instances, have been used. The CNO reiterates that the harmonisation of market conventions facilitates the acceptance of these instruments and avoids potential disputes at their settlement.

**The CNO suggests a taxonomy of the main instruments which should not be regarded as a risk-based classification:**

- In their prototypical format, bonds were, in essence, less risky than equities until recently, as the European bond market was *de facto* restricted to highly-rated issuers. Therefore, investment in bonds are often considered as systematically less risky than equities, regardless of their issuer. This biased view underpins the traditional distinction between bonds or fixed rate instruments, on the one hand, and equities or floating rate instruments, on the other hand.
- Today, with the rapid development of credit markets, a classification based on risk levels should also incorporate the credit quality of their issuers.
- Concerning structured issues, price changes can result from indexation clauses rather than from the credit quality of their issuer (e.g. a perpetual bond from a AAA-rated issuer with a coupon equal to 4 times the yield spread between the 10 year swap and the 2 year swap). The CNO is well-qualified to suggest a valuation methodology for such instruments (since they are solely indexed to interest rates) and to inform investors on their specific price volatility, possibly greater than that of the common stocks of this AAA-rated issuer.

**The CNO analysis is only based on valuation principles:**

- Initially comprised only of banks active on the bond market, the CNO has progressively increased its constituency, to include issuers and investors. Therefore, it does not promote the interests of any specific group.
- It does not seek to influence regulators' classification, often adopted for other purposes, for instance to assess solvency or accounting constraints. However, the CNO is open to a constructive dialogue with regulators, so as to cater to the needs of both issuers and investors.
- The CNO is not bound by legal, fiscal or accounting distinctions between debt or equity instruments or between bonds and debt instruments. However, these regulations are taken into account in its analysis.

The CNO closely monitors financial markets, the creation of new financial products or the emergence of new market conventions and it will adapt its analysis of fixed income securities accordingly. In some cases, the border between fixed income instruments and variable ones seems blurred. Thus, the CNO does not pretend neither to define a general taxonomy, applicable to all type of securities, nor to cover all types of instruments. For instance, the CNO has set up a specific working group for CDOs which has yet to publish its conclusions. Accordingly, this analysis does not deal with these instruments.

**Summary:**

We first recall the main characteristics of prototypical equities and bonds, and analyse the potential variability of their future cash flows. Then, we identify a simple requirement for a fixed income security: it cannot offer *ex ante* a negative yield to maturity.<sup>5</sup> Consequently, it must bear a minimum repayment price at maturity.

Having defined this rule, we turn to some complex securities, trying to evaluate from a financial standpoint whether they can be viewed as fixed income securities. We conclude that a binary classification of these securities is highly impractical. Therefore, we suggest to split some "mixed" securities into two components in order to measure their price sensitivity. Finally, using the market prices of equities, hybrid capital debt and senior bonds issued by a same issuer, we assess whether their price volatility validates the proposal to consider Hybrid Capital securities as fixed income instruments.

**1. Classification standards between debt and equity.**

Historically, investing in the stock market was often considered as speculative, when buying bonds was viewed as a conservative investment. The characteristics of these two types of securities were at that time clearly delineated. The following table provides the key differences in their respective cash-flows.

	<b>Equity</b>	<b>Debt</b>
Definition :	Owners' interest in the residual assets of a corporation after payment of all its liabilities.	Unqualified obligation to pay a predefined sum at a maturity date along with a fixed percentage of interest.
Voting rights:	Yes	No
Maturity :	Perpetual	Dated or perpetual
Repayment date :	At the liquidation of the issuer.	At maturity or at a contractual anticipated repayment date, call, put, default or liquidation of the issuer.
Repayment amount :	Unknown	Fixed in advance, usually 100% of the nominal amount.
Remuneration :	Dividend fixed annually by the issuer according to its distributable income.	Interest fixed at launch of the issue as a percentage of its nominal amount regardless of the issuer income.
Liquidation ranking :	The stockholders will receive a liquidation surplus, if all senior and subordinated debt has been previously totally repaid.	Investors can produce 100% of the nominal amount of their bonds. They will be repaid before stockholders.
Liquidation repayment :	Amount independent from the equity nominal value.	0 to 100% of the contractual nominal repayment amount.
Market price variation :	• Mainly depending on the anticipation of	Solely depending on the interest rate curve used to

	future results of the corporation, new equity issue and mergers and acquisitions. • Incidentally depending on the interest rate curve used to discount future cash flows.	discount future cash flows of the security.
Price correlation of securities launched by different issuers	Variable, but usually weak	Strong in the case of bonds launched by same credit quality issuers.
Quotation methodology:	Centralised Market quotation <sup>6</sup> involving the immediate matching of buy and sell end users' interests on the specific equity.	Quotation on an OTC market that does not necessarily necessitates the immediate matching of buy and sell end users' interest on the specific bond. <sup>7</sup> The trader can hedge its position with a bond launched by a different issuer.

**To complement this table notice that:**

- Future equity cash flows are fully variable and, in theory, equity prices can evolve between zero and infinity.
- Future fixed-income security's cash-flows, coupons and principal repayment, are predetermined or predeterminable (in the case of a floating-rate issue).
- A vast majority of bond issues are dated, although they can also be perpetual. The issuer must pay the coupons according to the schedule defined in the documentation<sup>8</sup> and repay 100% of the contractual repayment amount, either at maturity, or at a contractually-agreed earlier date, or in case of default.
- In the case of liquidation of the issuer, bondholders can claim 100% of the contractual reimbursement value of the bond. Senior debt holders are *pari passu* with other senior creditors, and are repaid before subordinated creditors and equity holders.

The pricing/hedging method used by bond traders probably contributes to the lower volatility of bonds' prices. Indeed, all, fixed-income security prices incorporate a common component: the benchmark interest rate reference corresponding to their maturity. Therefore, the bond of a specific issuer is quoted in relative terms to this reference, explaining the high correlation between the yields of bonds from different issuers with similar rating.<sup>9</sup> To the contrary, the equity market needs the immediate matching of buy and sell interests on the same specific equity and this can create a higher volatility.

*We now detail the cash-flows of fixed income securities and conclude that such instruments must pay a remuneration linked to the benchmark reference applicable to their maturity in addition to its issuer specific margin. In principle, fixed income securities cannot offer ex-ante a negative yield to maturity and consequently, they must guarantee at maturity a minimum repayment price.*

**2. Cash-flow analysis for fixed income securities denominated in a sole currency: <sup>10</sup>**

**2.1. The interest rate cash-flows for a fixed income security** can be split between the interest-rate reference commonly used for this security and the margin paid by its issuer:

**2.1.1. The benchmark reference of a fixed income security, money market, bond or swap reference cannot in principle be negative:**

- In economic theory, nominal interest rates cannot be negative. Otherwise, instead of buying a bond, investors would rather keep their holdings in cash or invest them in other securities. In practice, however, in a low-rate environment, some countries have experienced negative interest rates, although only for a short period of time.<sup>11</sup> Therefore, one cannot preclude the future occurrence of negative interest rate under unusual market conditions.
- Real interest rates can become negative, but they only represent one fraction of the total yield of fixed income securities, since these yields are always expressed in nominal terms, as opposed to, say, the yields of an inflation swap.<sup>12</sup> In the past, in periods of high inflation, the market has experienced negative real rates, when measured against current inflation. The real yield of close-to-maturity inflation-linked bonds is also sometimes negative.<sup>13</sup>
- Inflation can also be negative, but in such case, the market-based real rate should compensate for the expected negative inflation, if one accepts that, under normal conditions, nominal rates cannot be negative. We will see later that ex-post, the indexation of the principal of an inflation-linked bond can generate a negative yield to maturity. But the coupon of inflation linked bond using an index ratio cannot be negative.

**2.1.2. The margin paid by the issuer is comprised of various (positive or negative) components:**

- **The issuer's credit margin:** For a risky issuer, this often represents the bulk of the margin paid by the issuer.
- **(II)liquidity margins:** A given issuer can pay different margins for bond issues denominated in the same currency and with the same maturity, depending on the type of instruments. For instance, on an asset –swap basis, the AFT (Agence France Trésor) does not pay the same margin on its 4% April 2009 OAT, its TEC10 2009 OAT and its 3% 2009 OATi. The differences can be explained by the varying appetite for such bonds and by the (il)liquidity spreads attached to these issues.

- **Floating-rate bonds' margin:** These bond issues are tied to indices with possibly different maturities from those of these issues. For instance, one could consider a 5-yr. floating-rate bond indexed to, say, a 10-yr. TEC or CMS. In this case, since the maturity of the reference index extends beyond the maturity of the bond, these issues bear a specific margin so as to equalise the yield of their future coupons with the yield paid by the issuer on fixed-rate security with the same maturity.<sup>14</sup> This margin can be additive, e.g. TEC – 1%, or multiplicative, e.g. CMS x 85%. In the latter case, the application of this ratio cannot generate a negative coupon, as long as the value of the reference is not itself negative.

**2.1.3. A fixed-income security cannot bear a negative coupon.** Back-office systems do not handle negative coupons as it would be very difficult to organise the coupon payment by the investor. The coupon of a floating rate bond bearing a negative margin, for instance a TEC -1%, could become negative if its reference were fixed at a lower level than the its negative margin. Such a situation occurred in 2003 with the floating rate JGBs, the Japanese equivalent of TEC 10 OATs and, as the coupon of the floating rate JGB n° 17, was reset at -1.03%. In January and July 2003, the 0% floor borne by these bonds was activated. In France, TEC 10 OATs do not bear an explicit floor, but lawyers usually consider that French law precludes negative coupons, under the theory of the unilateral obligations of a loan contract.<sup>15</sup>

**2.1.4. The CNO considers that a fixed income security bearing a coupon that could be reduced to zero, prior to the exercise of a protection (e.g. a 0% floor), as a result of its reference to a multiplicative ratio, does not constitute a fixed-income security.** This is notably the case with securities indexed on a curve spread, for instance a bond paying 4 X (CMS 10 - CMS 2). The remuneration of this bond can differ markedly from the prevailing rates for bond with the same maturity or with the maturity of its reference. Nonetheless, the CNO recognises that investing in such bonds can be appropriate for investors willing to modify their exposure to the shape of the curve.

**N.B. This principle has been acted by the CNO. However, its formulation could be reviewed, if it appeared that it were not accurate enough.**

**2.2. The principal amount of a fixed income security (its contractual repayment price) shall bear a minimum repayment price,** guarantying that the yield to maturity of the security, calculated *ex-ante*, can not be negative.<sup>16</sup> However, a fixed income security can be priced above its repayment price.<sup>17</sup>

**2.2.1 The general case of nominal bonds:** Fro the sake of simplicity, we only detail the case of bullet bonds. However, this analysis can be generalised to sinking bonds, each of their repayments being considered as a zero coupon.

- **As long as the issuer is solvent,** according to market conventions, the yield to maturity is always calculated using the contractual repayment price. Taking the bond market price, the yield expresses the remuneration that the investor gets, if the issuer repays the bond at maturity.<sup>18</sup> A fixed income security with a repayment price indexed on a predetermined formula must bear a minimum repayment price. If the contractual repayment price is not indexed, its value cannot increase: Bond investors have no voting rights and no interest in the residual assets of the issuer.

- **In the case of the issuer bankruptcy, the investor can claim 100% of the fixed issue contractual repayment price.** Otherwise, the instrument can not be considered as a fixed income security.<sup>19</sup> Depending on the liquidation price of the issuer's assets, investors receive between 0 and 100% of their claim. The default of a prime issuer is a low-probability event and if it materialises, the recovery rate on senior debt is usually rather important. For instance, In the case of Delphi, the US automotive part company, the recovery rate was estimated in 2006 at around 50%. However, the recovery rate of subordinated issues is nil, unless all senior and subordinated debt issues have been repaid in full.

**Aside from the sole financial point of view, many regulations requires that a fixed income security be most of the time contractually repaid at par.**

- Legally, in France and some other countries, a bond was initially considered as a loan contract incorporated in a negotiable security and its principal had to be repaid at par.<sup>20</sup> Today, lawyers generally consider that the applicable law for bonds is independent from the law for loan contracts and that a bond does not necessarily have to bear a minimum repayment price. However, the ACAM, the French insurance companies' regulator, indicates that selling to retail investors a security that does not bear a minimum fixed repayment price as a bond can be misleading.<sup>21</sup>

- The European directives defining debt securities (including fixed-income securities) and shares (and other variable-yield securities) do not explicitly mention a minimum fixed repayment price for fixed income securities. However, this clause is generally imposed by domestic regulation applicable to investors. IFRS accounting standards stipulate that held-to-maturity investments are assets that have fixed or determinable payments. The ECB defines assets that are eligible for Eurosystem monetary policy operations as "debt instrument having a fixed unconditional principal amount".<sup>22</sup>

**2.2.2. The specific case of inflation linked bonds :**

- Inflation-linked bonds (I/L bonds) bearing an explicit par guarantee at maturity belong clearly to the fixed income security group. Most of sovereign I/L bonds bear such a guarantee, activated if, at maturity, the CPI index is lower than its prevailing value at the launch of the issue.<sup>23</sup> Even with this guarantee, an I/L bond, like all floating rate bond, can in theory offer a negative ex-post yield to maturity. Notice also that Canadian, Japanese or British I/L bonds do not bear such a guarantee. However ECB eligibility rules accept I/L bonds without this guarantee since it stipulates that « Furthermore, inflation indexed bonds are also eligible ».

- As already indicated, the CNO only recognizes as fixed-income security those bonds bearing a fixed or minimum repayment price, since a nominal market rate cannot, in principle, be negative. For I/L bonds, the Fisher equation states that inflation and real rates are the two components of nominal rates. According to this breakdown, and since 1) these bonds only pay these two components and 2) before indexation, they have a fixed contractual redemption price, the CNO treats I/L bonds as fixed-income securities even if they do not include a par guaranteed redemption price. Indeed, whatever the evolution of the CPI, these bonds have maintained their purchasing power.

**2.3. The above detailed features of fixed income securities must not change until their redemption.** In particular, these bonds must always remain senior to equities. Some mandatory convertible bonds bear a conversion features that, under certain circumstances, allow the issuer to convert the issue into the common stocks. Once converted, these securities become *pari passu* with these common stocks and their future cash flows are no longer determined. Consequently, the CNO excludes these securities from the fixed income category.<sup>24</sup>

**2.4. In order to abide by its by-laws requiring it to analyse fixed-income securities, the CNO proposes the following definition:**

**Fixed income securities cash flows are either fixed or determinable, in the case of floating interest rate:**

**A.** Fixed income securities must either bear a fixed repayment price or a minimum repayment price ensuring that their nominal returns calculated *ex ante* cannot be negative;

**B.** Once acquired, these securities offer to investors, up to the effective repayment by the issuer, a current income that is either fixed or strongly correlated with the fixing of their reference rate, in the case of floating rate bonds:

a. The current return of floating rate bonds is exclusively determined by the reference interest rate, money market, bond or swap rates and by the margin paid by the issuer;

b. Floating-rate coupons of fixed-income securities cannot be reduced to zero, by the application of a multiplicative ratio to their reference, even if a provision states that these coupons can not fall below a contractually-defined minimum (the "floor"), (wording to be validated).

**C.** The detailed features of fixed income securities must not change until their redemption.

**2.5. Fixed income securities price volatility:** The market price of fixed income securities changes only with the variation of their yield to maturity. Depending on the credit quality of the issuer and on the security's maturity, the market price volatility of a fixed income security issued by a specific issuer can be higher than the market price volatility of the common stock of another issuer.

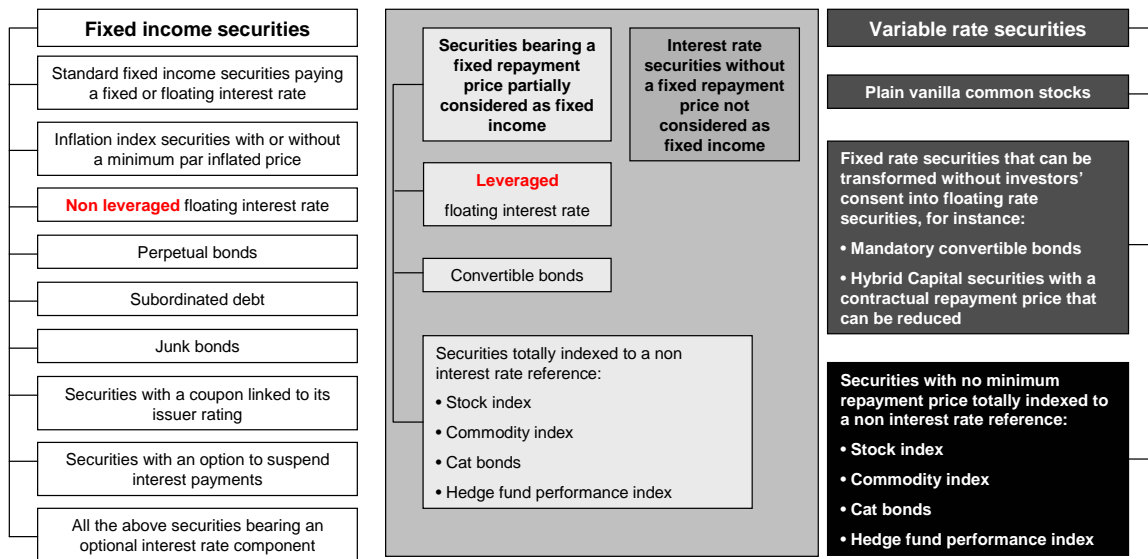
In addition, the CNO proposes that, instead of a binary classification between fixed income securities and other securities, mixed instruments be split and considered as the combination of a fixed income instrument and a floating income one.

For example, a security paying a fixed principal amount at maturity and a coupon linked to an equity index with a floor at 0% will be treated as the combination of:

- A fixed income security: the zero-coupon principal repayment at maturity,
- A floating income security comprised of the string of its equity-indexed periodic coupons with a minimum of 0%.

*Based on this analysis, we review various securities and their different characteristics to determine whether they can be considered as fixed-income securities.*

3. The following table proposes a non-exhaustive classification of securities into three categories, depending on the potential variability of their cash-flows:



- The first category is comprised of securities that the CNO considers as “pure” fixed-income securities, according to the three A, B and C criteria.
- All the securities included into the second category include an interest rate component and their valuation principles are either partially or totally concerned by CNO’s recommendations. This second category can be split into two sub-categories: The first one includes the instruments bearing a minimum repayment price and a remuneration that is not linked to interest rates. The second one includes instruments with a remuneration linked to interest rates, without however guarantying a minimum repayment price. The CNO considers that the securities belonging to the first sub-category can be partially analysed as fixed income securities and it suggests valuing independently their fixed-rate component.
- The third category lists securities that are not subject to CNO’s recommendation.

To sum up, fixed income securities:

- Cannot offer a negative ex-ante yield to maturity, and
- Their coupon must be highly correlated with their reference yield, in the case of floating interest rate securities.

3.1. Fixed income securities must bear a minimum repayment price insuring that, whatever the changes in their remuneration, they cannot offer ex-ante, under current market conditions, a negative yield to maturity.

We now detail the reasons why we have classified some securities into the fixed-income category:

3.1.1. **Floating interest rate securities paying a coupon that cannot be reduced to zero, with the application of a multiplicative ratio to their reference, independently of the possible inclusion of a minimum contractual remuneration, floor.** This category includes floating rate securities bearing an additive margin, even if their coupon can in theory be reduced to zero, if their reference is fixed at a very low level. From 2003 to 2005, 3 month Japanese yen Tibor has been fixed on average at around 5 bps.

3.1.2. **Perpetual securities:** In several countries, their remuneration is taxed as a dividend and, under certain conditions, they can be treated according to IFRS accounting standards as equity. However, they are usually classified as fixed income securities by regulators, even if the uncertainty about their repayment date prevents their inclusion in held-to-maturity portfolios. Most of these securities are callable, from a certain date onwards, and their effective repayment date is not fixed. But, in the case of an earlier repayment if they are called or of default of the issuer, the investor can claim 100% of the issue contractual repayment price. Consequently, their repayment price is considered fixed.

3.1.3. **Subordinated securities:** The principal and interest subordination clauses do not prevent investors from claiming 100% of the issue contractual repayment price.

**3.1.4. Junk bonds:** The above argument also applies to junk bonds.

**3.1.5. Securities bearing a coupon varying with a change in the issuer's rating:** This clause does not fundamentally alter the nature of these securities. The price of a bond without a similar clause would also vary with a change of rating, reflecting a change in its underlying yield. Such bonds are eligible to ECB monetary operations since the Central Bank states that: « The coupon may be linked to a change in the rating of the issuer itself ».

**3.1.6. Hybrid capital securities that can suspend interest payments:** The amount of coupon paid does not depend on the issuer's results. In a binary way, either the coupon is paid or it is not, due to a change in the credit quality of the issuer. The "suspension of payment" option is exercised in the case of a credit event which would also influence the credit spread paid by the issuer on its standard issues.

**3.2. Grey category: Securities mixing some fixed-income features with others.** A standard arbitrage relationship exists between interest rates and the forward price of any asset. The asset's forward price is equal to its spot price adjusted for its cost of carry up to its forward sale. Thus, one can exchange the cash flows of a fixed income instrument against other cash flows, for instance a stock index, altering the nature of the security. However, securities bearing a minimum fixed repayment price can be partially classified as fixed income securities.

**3.2.1. The CNO proposes that instead of assigning in a binary way each security to a category (fixed or floating categories), a "mixed" security be split** and considered as the combination of (i) a fixed income security (corresponding to the its minimum repayment price plus eventually its minimum periodic coupons) and (ii) a floating-rate security. The CNO is only involved in the theoretical valuation and standardisation of fixed-income securities and is not bound by accounting treatments or by issuers' and investors' regulations:

- The pricing of the fixed-income component of "mixed" securities bearing a minimum repayment price is usually simple, as, in most instances, it amounts to pricing fixed-rate cash flows. One can easily verify that the fixed income component cannot produce *ex-ante* a negative yield to maturity, by comparing its acquisition price and its redemption price, taking eventually into account the fixed coupons. If the issuer is a frequent issuer of plain vanilla bonds, it is easy to determine its reference credit curve. This reference curve could be used to price the fixed - income component of mixed securities and would bring more transparency to the valuation of such securities. With a flat curve at around 4.5%, the net present value of the zero-coupon corresponding to the minimum par repayment constitutes an important share of the security price: respectively about 80% for a 5-yr. security, 73% for at 7 yr. one, 64% for a 10-yr. and 52% for a 15-yr. And if these mixed securities pay a strictly positive minimum coupon, the value of their fixed income component is even greater. Therefore, notwithstanding accounting rules or other regulations, such a decomposition would enable investors to reduce the capital cost of holding these securities; and,
- The floating rate component can be seen as a floating security, a warrant, and not a hidden derivative, as long as the "mixed" security bears a minimum contractual repayment price.

**3.2.2. Securities that are partially treated as fixed-income securities.** The CNO includes in this category the fixed income components of the following securities, if and when they bear a minimum repayment price:

- Floating interest rate securities paying a coupon that can be reduced to zero, because of the application of a multiplicative ratio to their reference, independently of the possible inclusion of a floor,
- Fixed rate securities convertible into a floating rate instrument at the option of the investor,
- Securities bearing a remuneration partially or totally indexed on a non-interest rate reference, for instance: equity index, cat bonds, or hedge fund performance.

**3.3. Floating rate securities:** these securities do not bear a fixed minimum repayment price and their coupon can be reduced to zero with the application of a multiplicative ratio to their reference, independently of the possible inclusion of a floor

3.3.1. Securities indexed on an interest rate formula

3.3.2. Fixed rate securities that can be transformed into floating rate ones without investors' consent, for instance: Mandatory convertible bonds, Hybrid Capital securities with a contractual repayment price that can be reduced.

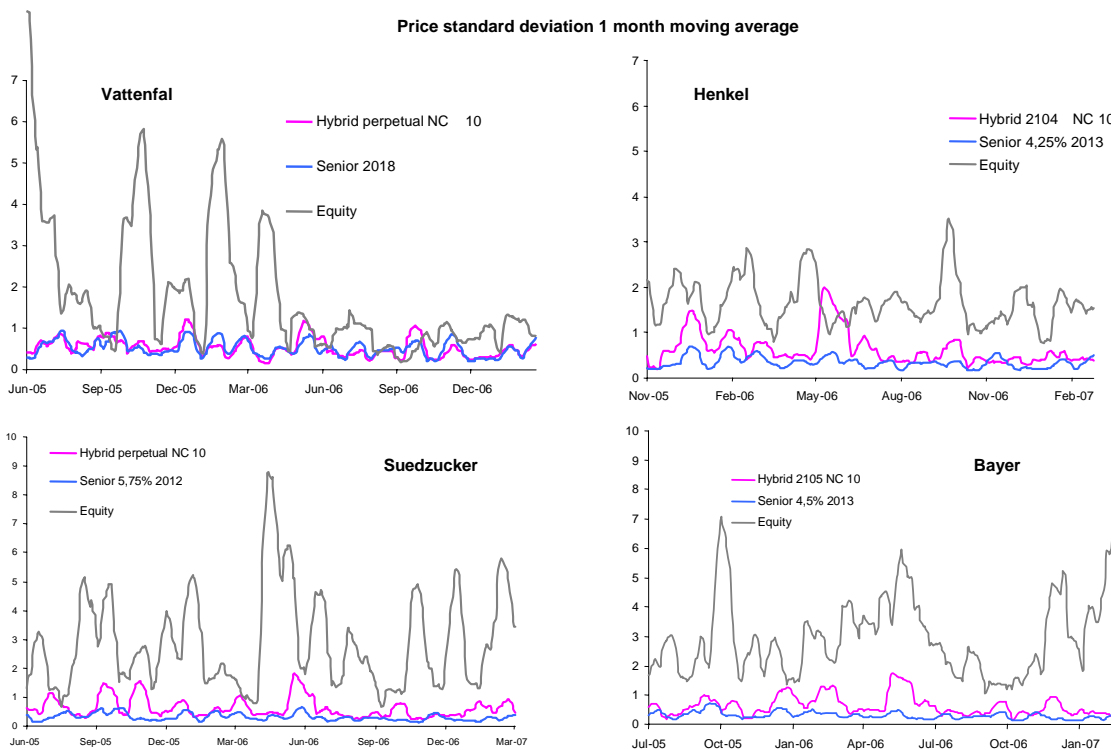
3.3.3. Securities paying a remuneration totally indexed on a non-interest rate reference, for instance: equity index, cat bonds, or hedge fund performance

The CNO hopes that this analysis of fixed income securities will contribute to a better understanding of interest rate instruments.

## Appendix

To illustrate the above analysis, we compare the market price volatility of a same issuer's securities, common stocks, Hybrid Capital securities and senior debt. The following charts show that Hybrid Capital Securities behave more like senior debt, even if Hybrid Capital securities bear some features that are quite different than that of the senior debt:

- Hybrid Capital securities are either very long dated or perpetual securities. Usually they bear a call at 10 year and a step up if not called.
- They are deeply subordinated, being only senior to the issuer's common stock and their rating is usually 2 or 3 notches inferior to that of their senior debt.
- Their issuer has the option to suspend, under certain conditions, the payment of interests and in some cases, unpaid interest is definitively lost by the investor.



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<sup>1</sup> Anthony P. Polito, "Useful Fictions: Debt and Equity Classification in Corporate Tax Law" (1998) vol. 30, Arizona State Law Journal 761-810.

<sup>2</sup> International regulators classify market securities into two categories, a fixed category and a floating one. For instance the directives 86/635/CEE and 91/674/CEE use the following terminology: « Debt securities including fixed-income securities » and « shares and other variable-yield securities ». And the same directives precise: "Securities bearing interest rates that vary in accordance with specific factors, for example the interest rate on the inter-bank market or on the Euromarket, shall also be regarded as debt securities including fixed-income securities". This traditional distinction between fixed rate securities and floating one is often confusing for those not familiar with these regulations. Unless otherwise specified, this document uses the terminology of :

- «Bonds», « fixed income securities » or « fixed rate securities », or « debt securities » to qualify securities bearing a fixed or floating remuneration linked to a fixed or variable interest rate
- And « Common stocks », « equity » or « other variable yield securities » to qualify securities with a remuneration that is not tied to interest rates.

The word « security » attached to these definitions clearly differentiates between fixed-income securities used as an investment vehicle and interest rate derivatives that do not constitute an investment vehicle.

<sup>3</sup> Such an absorption clause can for instance be attached to banks' hybrid capital instruments.

<sup>4</sup> Referring to the 2007/16/CEE Commission Directive, the AMF, the French mutual fund regulator, states that in a context of permanent financial innovation available to UCITS (mutual funds), the European regulation has chosen to enlarge the criteria governing their assets' eligibility, under the condition that their risks be adequately captured by the risk management process of the UCITS, and by its internal control mechanisms. «La responsabilité des sociétés de gestion dans la détermination de l'éligibilité des actifs pour l'investissement par des OPCVM », Revue Mensuelle de l'Autorité des Marchés Financiers, n° 35, avril 2007.

<sup>5</sup> However, an investor selling its bond before maturity can incur a negative yield, if the bond price has dropped.

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<sup>6</sup> With the Directive 2004/39/EC, MIFID Directive, equity transactions can be realised outside a regulated market.

<sup>7</sup> The market maker is not paid through a commission mechanism. It acts as the counterparty of sellers or buyers, using the positions of its trading books.

<sup>8</sup> Hybrid capital bonds include a clause allowing the issuer to suspend interest payments, under certain circumstances.

<sup>9</sup> In France the Règlement CRBF N° 90-01 indicates that in their held to maturity accounts, banks can group into an homogeneous category fixed rate securities that have, on a stable basis, a roughly equivalent interest rate modified duration and a same quality of credit compared with that of other fixed income securities included in the same category.

<sup>10</sup> This document does not analyse dual-currency securities.

<sup>11</sup> During the 1970s, Switzerland paid negative interest rates on non-resident deposits. However these negative rates cannot be considered as market rates, since they were imposed by specific regulations. The domestic Japanese market has also witnessed negative short-term rates. However, the Tokyo Interbank Offered Rate has never been quoted below 0%, even for one-week fixings, since January 1999. According to the Fed of Saint Louis, negative interest rates can occur in a very low interest rate environment, because individual are paying for a service that avoid the risks associated with holding cash (see "Nominal Interest Rates: Less Than Zero?", Fed of Saint Louis, D. Thornton January 1999).

<sup>12</sup> According to the so-called Fisher equation, a nominal rate incorporates a real rate plus the anticipated inflation and various risk premia (including the inflation risk premium) as well as a credit –related margin. A nominal rate security belongs to the deposit world where the real rate and inflation cannot be identified separately. For instance a structured security paying X times the inflation rate will always be priced using the real rate curve.

<sup>13</sup> "As indexed bonds approach maturity, the 2.5 month lag in indexation implies that they are being indexed increasingly with noisy past inflation, rather than with relatively smooth expected future inflation." J. Huston McCulloch, Department of Economics, Ohio State University.

<sup>14</sup> The not yet fixed coupons of a 5 year CMS 10 are priced as 10 year forward rates using the swap curve rates up to 15 years. In the case of a steep curve, these forward rates are priced at a higher yield than spot rates, explaining why such bonds pay generally a negative margin.

<sup>15</sup> « L'emprunteur a des droits et des obligations et le prêteur n'a pas à proprement parler d'obligation, compte tenu de la nature en théorie unilatérale du contrat de prêt ». Droit des Contrats Spéciaux des Editions Defrénois.

<sup>16</sup> The yield of a 4% 10-yr. bond bought at par becomes negative if its indexed principal is repaid below 60%. In theory, even with a minimum repayment price, the ex-ante yield of a floating rate bond can be negative. This would be the case of a bond paying a TEC 10 -1% coupon bought at 102%, two year before maturity and repaid at par, if its future coupons are on averaged fixed below 2%.

<sup>17</sup> That is notably the case with fungible bonds, like OATs, which are regularly reopened in different market conditions.

<sup>18</sup> Even if the default probability of the issuer increases, the calculation of the yield is always performed using the contractual repayment price, and the price of the default probability and the recovery rate are included in the credit spread of the bond.

<sup>19</sup> Banks' Hybrid Capital issues must incorporate a loss absorption clause allowing the bank to offset losses and to pursue its activity by reducing the nominal value of the hybrid bonds. In some cases, this reduction is definitive and holds in the case of the issuer bankruptcy where the investor can only claim the residual amount. These bonds are usually excluded by regulators from the fixed income category. However most of Hybrid Capital issues nowadays stipulate that even after price absorption, in the case of bankruptcy, the investor can claim the original amount he had invested.

<sup>20</sup> Defrénois, Droits des Contrats Spéciaux.

<sup>21</sup> ACAM, rapport annuel 2005. Furthermore, the AMF, in its general principles relative to complex debt instruments, stipulates that the prospectus of a debt instrument that can be repaid below par, must bear a specific warning.

<sup>22</sup> <http://www.ecb.int/pub/pdf/other/gendoc2004en.pdf> "They must be debt instruments having: (a) a fixed, unconditional principal amount; and (b) a coupon that cannot result in a negative cash flow. In addition, the coupon should be one of the following: (i) a zero coupon; (ii) a fixed rate coupon; or (iii) a floating rate coupon linked to an interest rate reference. The coupon may be linked to a change in the rating of the issuer itself. Furthermore, inflation-indexed bonds are also eligible. These features must be maintained until the redemption of the obligation".

<sup>23</sup> The US Treasury indicates that at maturity, the TIPS, Treasury Inflation Linked Securities, will be redeemed at the greater of their inflation-adjusted principal or par amount at original issue.

<sup>24</sup> These securities are not eligible to the ECB refinancing operations.