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## MOT DE LA RÉDACTION :

*Les Cahiers du Centre ont pour objectif de promouvoir et de valoriser la contribution des membres du Centre des Professions Financières et de ses groupes de travail. Chacun, quel que soit son domaine de compétence, est encouragé à soumettre un article de fond ou d'actualité sur des thématiques financières au sens large. Que vous soyez simple observateur ou expert d'un domaine particulier, praticien, doctorant ou chercheur, profitez de cette tribune d'expression, que le Centre met à votre disposition, afin de nous faire partager vos recherches, vos analyses ou vos idées.*

*Cette revue vise à rassembler la Communauté des Professions Financières, par delà la variété de nos domaines d'expertises, afin d'approfondir nos connaissances ou d'explorer des champs qui nous étaient jusqu'alors peu familiers et ce afin d'améliorer la compréhension des mécanismes financiers ou organisationnels qui nous entourent.*

*En espérant vous compter prochainement parmi les contributeurs de cette nouvelle revue de qualité,*

*Bien cordialement,*

*Céline VIALA*

## Editorial



**Edouard SALUSTRO**, Président Fondateur du groupe d'audit Edouard SALUSTRO ; Président d'Honneur du Conseil Supérieur de l'Ordre des Experts Comptables ; Cofondateur de la Fédération des Experts Comptables Européens (FEE) ; Fondateur de la Fédération Internationale des Experts Comptables Francophones (FIDEF) ; Président d'Honneur de l'Union Nationale des Associations des Professions Libérales (UNAPL) ; Président Honoraire de la section des finances du Conseil Economique et Social ; Président de groupe de l'interformation « statistiques d'entreprises » du Conseil National de l'Information Statistique ; Membre du Conseil National de la Comptabilité.

Dans le 1<sup>er</sup> numéro des *Cahiers du Centre*, le Président Alphanbéry a fixé le cap de la dernière initiative de notre institution : favoriser les échanges et le dialogue entre les membres du Centre et de ses clubs.

Jamais autant qu'aujourd'hui, les acteurs de la grande famille des Professions Financières ont éprouvé le besoin et ressenti le devoir, de comprendre, d'analyser et de transmettre à l'opinion publique, les origines et les conséquences de la crise actuelle.

Les solutions à dégager pour retrouver un meilleur fonctionnement des marchés, exigent plus que jamais un engagement ne se limitant pas au petit monde des spécialistes. Cette fois, il importe de sensibiliser des couches importantes de l'opinion, pour que se dégage une volonté collective de retrouver une situation normale et que se rétablisse un climat de confiance.

Chacun des articles présentés dans ce 2<sup>ième</sup> numéro, s'inscrit dans cette perspective en s'attachant à explorer et clarifier un ou plusieurs aspects de l'actualité. Ainsi, des articles de Christopher Schmitz (Lauréat du Grand Prix du Centre pour le concours des MEF) et de Jean-Jacques Perquel, qui apportent l'un et l'autre un éclairage documenté sur l'origine de la crise des subprimes, et de ses prolongements, notamment sur la financiarisation de l'économie.

Comme nous y a engagé le Président Alphanbéry, il serait souhaitable qu'à partir des apports de ces auteurs, s'établisse avec notre communauté, un dialogue interactif qui enrichirait à coup sûr les réflexions comprises dans ce cahier.

Il m'est agréable de vous souhaiter à tous bonne lecture en espérant vos réactions.

Edouard SALUSTRO

## *La crise dite des « Subprimes » remet-elle en cause la financiarisation de l'économie ?*



**Jean-Jacques PERQUEL**, Agent de change, Etudes : Lycée Janson-de-Sailly et Faculté de droit à Paris. Dipl. : Diplômé de l'Ecole des hautes études commerciales, Diplômé d'études supérieures de sciences économiques et du Centre de perfectionnement dans l'administration des affaires. Carr. : Employé de Bourse chez Lackenbacher (1959-70), Agent de change (depuis 1970), Trésorier-archiviste de la Société de statistique de Paris (1970-77), Président de la Société de bourse GPK (1970-90), Vice-président de la société GPK-Finance (depuis 1990), Président de d'Aguesseau conseil (depuis 1993), Vice-président de l'Association française des sociétés de bourse (1988-90). Œuvres : Manuel des opérations de bourse (1962), Principal Stock Exchange of the World (1964), Les Marchés financiers (197), les Bourses américaines (1992), le Marché financier anglais (1993), les Bourses d'Europe Centrale (1995). Décor.: Chevalier de la Légion d'honneur, de l'ordre national du Mérite. Membre du Cercle de l'Union Interalliée.

Le Professeur Molodovski envisageait trois phases dans le développement d'un investissement : une période de croissance rapide (lancement), ensuite une zone de stabilisation et enfin une décadence profonde. On retrouve ce type d'évolution dans l'histoire économique. La première période est caractérisée par l'existence d'« entrepreneurs sanguins », tels que les imaginait Keynes. Il prend des risques, mais s'il réussit, sa rémunération est importante. La croissance de la période suivante est le fait d'« administratifs » nommés par des actionnaires. Ils proviennent de l'intérieur de la société ou sont choisis à l'extérieur (ENA en France, Avocats d'affaires aux USA). Ils assurent une croissance régulière, leur rémunération devrait dépendre de leurs résultats. Ils sont, en théorie, licenciables « ad nutum » en cas d'échec. Enfin viennent les « financiers » qui cherchent à empêcher la décadence des entreprises et prennent une nouvelle forme de risque avec une forte rémunération s'ils réussissent. En cas d'échec ils accélèrent la décadence de l'entreprise.

Bien entendu, ces trois types d'entrepreneurs peuvent coexister. A titre d'exemple, on peut citer parmi les créateurs Bill Gates, Claude Bébéar ou Richard Branson. La deuxième catégorie comprend des « managers » comme Patrick Kron (Alstom). Mais surtout l'époque actuelle est caractérisée par un développement de la « finance » suivant plusieurs modèles.

D'une part, le pur « proprietary trading » est représenté par Warren Buffet. Celui-ci prend des participations le plus souvent majoritaires. Il les conserve très longtemps pour en accompagner le développement. On peut mettre en parallèle les compagnies d'assurance, les caisses de retraite et tous les « mutual funds ». Ceux-ci ne cherchent pas des prises de contrôle d'entreprise, mais ils aident les opérateurs désireux d'effectuer des OPA (Offres publiques d'achat), car, en concentrant de grandes quantités de titres, ils peuvent les apporter en bloc aux acheteurs.

Mais la plupart des opérateurs de proprietary trading utilise la technique du LBO (leverage buy out). Elle consiste dans l'achat d'une société, avec un simple apport de 20% du prix convenu, le reste étant fourni par différentes tranches d'emprunts de plus en plus « subordonnés » dont les fameux emprunts « mezzanine » dont le risque est considérable. L'opérateur assure le développement de la société « cible », développement qui doit être important, puisque celle-ci doit pouvoir payer les intérêts des dettes, les rembourser et distribuer des dividendes à l'acheteur. Celui-ci cherchait à ne conserver la société cible que 5 ans, mais de plus en plus, il désire s'en débarrasser au bout de 2 ans, en la revendant directement à un industriel du secteur ou à un nouvel opérateur qui va réaliser un LBO secondaire. On

peut arriver à faire sur la même société 5 LBOs de suite. Les principaux opérateurs sont américains : Texas Pacific Group (qui a effectué en 2006 pour 120 milliards de dollars d'opérations), Blackstone (93 milliards), Bain Capital (84 milliards), KKR (célèbre pour avoir réalisé en 1981 le rachat de RJR Nabisco pour plus de 30 milliards de dollars, montant dépassé en 2007 par le rachat conjoint par KKR et Texas Pacific Group de la société texane d'énergie TXU pour 45 milliards de dollars). En France les principaux opérateurs sont Wendel, Eurazeo, Lagardère et PAI.

A côté de ces sociétés spécialisées il faut citer les Hedge Funds. Ceux-ci gèrent 1 500 milliards de dollars et si le proprietary trading n'est pas leur vocation, ils sont devenus si importants que les Bourses ne sont plus suffisantes à leur activité. Elles entrent en concurrence ou se joignent aux fonds de LBOs en devenant elles-mêmes des opérateurs de ce style. Bien entendu, si des LBOs ont permis des redressements spectaculaires (c'est le cas d'Alain Afflelou), les endettements d'entreprises entraînent parfois des faillites.

La crise actuelle a pour cause immédiate la saturation du marché des ventes de logements aux USA, saturation qui a débuté fin 2005. Or lorsqu'un mouvement économique s'arrête, les courtiers cherchent à le poursuivre artificiellement, quitte pour cela à effectuer des opérations dangereuses ou malsaines. L'arrivée de Fastow chez Enron en 1997 et l'utilisation de milliers de SPVs (Special Purpose Vehicles) à précédé la fin de la spéculation sur les ITs (Information Technology), le marché étant saturé, sans que le grand public ne s'en soit rendu compte. Dans le domaine du logement il y a eu une situation analogue : ventes et locations trouvaient difficilement des preneurs. Les courtiers ont alors recherché des clients plus ou moins solvables, en leur faisant miroiter la reprise de la hausse des prix et pour les convaincre ont inventé des contrats à taux variable dits 2-28 qui représentent les 400 milliards de dollars de Subprime auxquels s'ajoutent 200 milliards de prêts moins risqués mais presque aussi dangereux (dans ces contrats 2-28, on ne paye que le taux d'intérêt, d'environ 8,5% pendant 2 ans, le remboursement commençant ensuite pendant les 28 années suivantes).

Les banques et les autres institutions, gênées par l'existence de taux d'intérêt très bas, ont voulu profiter de la manne représentée par les taux quasi-usuraires prélevés sur les contrats subprime, et ont pris des risques importants. Ainsi la Citicorp, qui détient 125 milliards de fonds propres, s'est engagé en niveau 3 à hauteur de 135 milliards sur lesquels, à l'heure actuelle, elle a dû provisionner 25 milliards quitte à obtenir un soutien de fonds souverains (le niveau 3 correspond à l'ensemble des opérations à effet de levier non encore dénouées). Mais si l'on commence à connaître les provisions d'AIG, on ignore encore celles des autres compagnies d'assurance et celles des caisses de retraite, qui ne seront publiées que dans quelques mois. Cette absence d'information autorise toutes les rumeurs et cela entraîne une crise de confiance de grande ampleur. Elle remet en cause tous les contrats de prêts et en particulier les LBOs.

Des mesures sont actuellement prises pour corriger cette situation : intervention des fonds souverains en faveur des grandes banques internationales, baisse des taux directeurs aux USA, prêts à quelques mois de la plupart des banques centrales. Il ne faut pas oublier l'existence d'une masse monétaire internationale trop abondante que les banques ne pourront pas thésauriser longtemps sans réduire fortement leur rentabilité.

Cependant il y a deux éléments d'incertitude :

1. L'inflation des coûts due à la hausse des matières premières et des prix agricoles (concurrence de l'éthanol et hausse des demandes des pays émergents).

2. La baisse des prêts incite à réduire les investissements et à augmenter le chômage avec un effet cumulatif. C'est le cas classique de la Stagflation.

Peut-on prévoir l'évolution de cette situation ? Beaucoup de sociétés de LBOs pourraient disparaître entraînant de nombreuses faillites, mais cette technique reste utile pour dynamiser des entreprises dont les dirigeants se sont révélés incapables d'assurer une croissance suffisante. Le danger de cette financiarisation est le « short termism » qu'elle entraîne, qui peut se révéler dangereux par absence de vision de l'avenir, mais cette crise doit permettre d'inciter les intermédiaires à se « Buffetiser » car il ne faudrait pas vider « le bébé avec l'eau du bain ».

## *What is the impact of the U.S. subprime lending crisis on the CDO market?*



**Christopher Schmitz**, CERAM – European School of Business, Sophia Antipolis, France (September 2006 – November 2007), **Ecole Supérieure de Commerce**, La Rochelle, France (September 2004 – December 2004), **International School of Management (ISM)**, Dortmund, Germany (March 2003 – August 2006), **Technische Universität Wilhelmina Carolina**, Braunschweig, Germany (October 2002 – March 2003), **Dublin City University**, Dublin, Ireland (July 2002 - September 2002), **Mariengymnasium** (highschool), Werl, Germany (August 1992 – July 2001), **Hoffmann Asia Ltd**, Ningbo, P.R. China – Internship in Analysis and evaluation of suppliers in China (June 2005 – September 2005), **Martin Mulligan Ltd**, Dublin, Ireland - Internship in Sales and Marketing (January 2005 – March 2005), **Schmitz & Soehne Gmbh & CoKG**, Wickede, Germany – Internship in Export department (June 2004 – September 2004), **Schmitz & Soehne Gmbh & CoKG**, Wickede, Germany - Internship in Sales and Marketing (June 2003 – September 2003), **Marienkrankehaus**, Wickede-Wimbern, Germany – Voluntary Service in a hospital (August 2001 – June 2002), **Lauréat du Grand Prix** du Centre des Professions Financières

### 1 Introduction

#### 1.1 Problem statement

Global stock and credit markets were shaking over weeks at the prospect that the subprime mortgage market is in a crisis and might pull the U.S. into recession and slow down world growth. All over the world financial press is and was recently dominated by negative headlines about the problems in the sub-prime lending industry in the United States and the negative impacts the crisis in this field might have on local economies, financial markets and financial products.

Subprime lenders such as one of the most prominent cases New Century Financial were facing enormous problems and filed for bankruptcy, as many borrowers were not able to pay their mortgages as interest rates have risen and housing prices in the U.S. dropped in value<sup>1</sup>.

According to a study undertaken by the Center for Responsible Lending which analysed more than six million subprime mortgages in the U.S. since 1998 the foreclosure risk in this market has spiked up tremendously and prospects for the future are even worse. It was reported that 2.2 million households in the subprime market either have lost their homes to foreclosure or hold a mortgage that will fail in the future.<sup>2</sup>

A subprime mortgage loan is a type of loan that is provided at a rate above prime to individuals who have low credit ratings or a higher chance of defaulting on their debt payments. These loans have higher interest rates than prime rates that are offered on traditional loans, as the lender wants to be compensated for the higher credit risk he takes.<sup>3</sup>

The massive subprime turmoil was the key motivation to take a closer look on the subprime lending industry and led to the central question: “What is the impact of the U.S. subprime lending crisis on the CDO market?” The focus is pointed on this question because the subprime lending crisis does not only have a huge impact on the wealth of people that are affected but also on financial

<sup>1</sup> Gapper (2007)

<sup>2</sup> Schloemer et al. (2006), p. 3-5

<sup>3</sup> Investopedia (2007a)

markets and industries, in particular on the CDO market. According to JPMorgan, in this market, which increased by almost half to USD 918 billion last year, about USD 173 billion of CDOs backed mainly by U.S. subprime mort-gage bonds and related derivatives were created last year.<sup>4</sup>

Essentially CDOs are asset-backed securities that are backed by a portfolio of debt obligations. A CDO can be compared to a regular mutual fund that buys bonds. The difference is that the securities CDOs sell are themselves bonds. These securities are called tranches. CDOs are unique in such way that the tranches represent different types of debt and credit risk. Each tranche has a different maturity and risk associated with it. The higher the risk, the more the CDO pays. Typically there are three to seven tranches of risk, the most senior would be AAA (lowest risk) the most junior (equity tranche) is unrated, but if it would be rated it would be below investment grade.<sup>5</sup>

## 1.2 Objective and methodology of this dissertation

As stated above, the main objective of this dissertation is to shed light on the impact of the subprime lending crisis on the CDO market. In order to guarantee a clear structure, the paper follows three central questions that guide the reader to the final conclusion. The three main chapters are corresponding to these questions.

### Central questions

1. What are the roots and the main characteristics of the U.S. subprime lending crisis?
2. How and why do these risky subprime mortgages end up in the collateral of CDOs and expose them to the current inherent risks of the U.S. mortgage industry?
3. What is the impact of the U.S. lending crisis on the CDO market?

Figure 1: Central questions<sup>6</sup>

The first chapter “The subprime lending crisis in the U.S.” has the aim to familiarize the reader with the US mortgage industry, its participants and the roots of the subprime lending crisis and simultaneously gives an answer to the first central question “1.What are the roots and the main characteristics of the subprime lending crisis?”. Furthermore it is important to introduce some basic terminology and definitions referring to this topic in order to guarantee a clear understanding of the problem.

Since the 1980s, securitization has developed to an important funding strategy for banks and finance companies and has more recently shown that other types of firms use it as a funding source, as

<sup>4</sup> Shenn (2007)

<sup>5</sup> Kothari (2007)

<sup>6</sup> own illustration



well.<sup>7</sup> Chapter two will illustrate and describe how securitization works in general and then give a detailed introduction to mortgage-backed securities (MBSs) and collateralized debt obligations (CDOs). This is necessary because the securitization process of mortgages involves several different steps. First they are securitized in the form of mortgage-backed securities, then the resulting bonds are res securitized in CDOs. Hence, this chapter shows how CDOs get exposed to the risks of the

U.S. subprime mortgage industry and provides the theoretical groundwork for the last chapter. There is a variety of options and techniques of how to securitize mortgage loans but they all follow the same and simple idea of securitization. That is why this process is explained with attention to details and elaborateness.

The last chapter examines how big the exposure of the CDO market to the U.S. subprime industry is in order to identify if the current concerns about CDO performances are justified. Subsequently the main factors that drive the performance of the assets in CDO portfolios are analyzed and how the current market, regulatory and economical conditions affect them. Based on these consolidated findings a conclusion will be drawn that estimates how the CDO market will react on the subprime woes and if a major fallout is likely to occur.

## **2 The subprime lending crisis in the U.S.**

### **2.1 Characteristics of the crisis**

Subprime lending is a relatively new and fast growing sector of the U.S. mortgage market. It offers an alternative source for credit for borrowers that, for a variety of reasons, would otherwise not be qualified for a loan in the standard (prime) mortgage market.<sup>8</sup>

It is not possible to determine a definite point in time when the crisis began but the first signs became visible at the end of the 2006 trading year. Delinquencies and foreclosures are certainly getting the most attention, considering the up-ward turn they have taken in the past months. The probability of foreclosure on a subprime loan doubled in only three years between 2002 and 2005. Subprime loans that were issued in 2002 have a one-in-ten chance of foreclosing before maturity while subprime loans originated in 2005 and 2006 have a one-in-five chance.<sup>9</sup> The problem simply was that it became too easy for borrowers to get a mortgage. Questionable mortgage lenders were giving loans to cash-strapped borrowers. Lenders were aware that defaults and delinquencies would rise but they also calculated that higher profits would compensate the risk. Moreover they could transfer the credit risks to investors on financial markets by securitizing the loans and selling the securities. Besides mortgages lenders created gimmicks to attract borrowers: mortgages that were initially interest only, adjustable-rate mortgages, mortgages with no downpayments, mortgages with no or low documentation, no credit check and often even income verification was not necessary.<sup>10</sup> One out of many advertising campaigns launched by a mortgage lender for example stated:

The subprime lending crisis in the US “With less-than-perfect credit you may have been turned down by other lenders. But we’ll work hard to get you the money you need! To us, you are more than just a credit score!”<sup>11</sup>

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<sup>7</sup> Roever (1999), p. 1

<sup>8</sup> Robb (2007)

<sup>9</sup> Schloemer et al. (2006), p. 4

<sup>10</sup> Mansori (2007)

<sup>11</sup> Scholtes (2007)

On the first sight these developments were positive because this type of lending definitely increased the number of homeowners and gave these borrowers a chance to create wealth as figure 2 illustrates.

## Homeownership rates for the US, 1985-2007

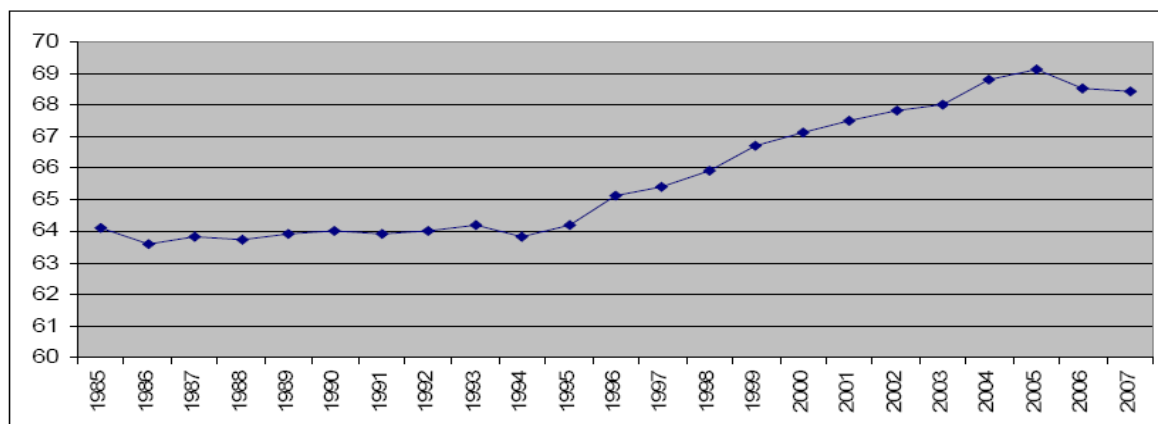


Figure 2: Homeownership rates for the US, 1985-2007<sup>12</sup>

The problem is that the boom in the US housing market masked a high amount of delinquent borrowers in the subprime segment over the last years. In vintages where housing prices increased homeowners who struggled with their mortgages had enough equity to cover their loans or to enter into a second or third mortgage to refinance their initial mortgage. Now, in an environment with house price appreciation slowing down this is not possible anymore (figure3). The probability of default is lower on an appreciating asset than on a depreciating asset.<sup>13</sup>

## OFHEO House Price Index for USA

House Price Quarterly Appreciation Annualized (%)

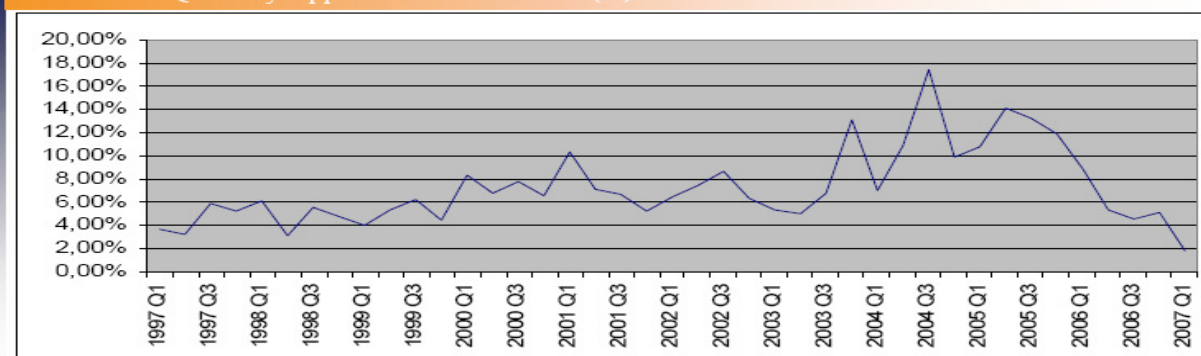


Figure 3: OFHEO House Price Index for USA<sup>14</sup>

<sup>12</sup> Callis / Cavanaugh (2007), p. 4

<sup>13</sup> Wheeler et al. (2007), p. 9

<sup>14</sup> Russell / Mullin (2007), pp. 4-5

The Center for Responsible Lending in the U.S. estimates that 2.2 million subprime loans that were made in recent years have already ended in foreclosure or will fail in the future. Twenty percent of all subprime mortgages issued during the last two years will end in foreclosure. This will cost homeowners around USD 164 billion.<sup>15</sup>

## 2.2 The U.S. subprime mortgage industry and its participants

Certainly subprime lending is more expensive than prime lending because lenders take a higher amount of risk, as outlined in the next chapter when the characteristics of a subprime loan will be discussed in detail. The subprime sector has grown to a significant and important pillar of the U.S. residential mortgage market reaching an issuance volume of USD 613 billion in 2006. This is a market share of 21% in the whole mortgage industry. The origination volume increased by 411% since 2001.

Another important fact that facilitated homeownership and magnified the growth of the subprime sector was, that most of the mortgages that were issued in the subprime market were repackaged as mortgage-backed bonds, a process called securitization. These securities were sold to investors all over the world too feed their appetite for high yields. In 2006 USD 449 billion have been securitized, mainly in the asset-backed-securities market. On average more than two third of all issued subprime loans have been repackaged into securities since 2001. This provided an alternative source of funds for mortgage originators and enhanced liquidity.

<b>Subprime issuance volumes in billion USD</b>			
	<b>Loans</b>	<b>MBS</b>	<b>Percentage of securitized subprime loans</b>
2001	120	87	72.50 %
2002	185	123	66.49 %
2003	310	195	62.90 %
2004	530	363	68.49 %
2005	625	465	74.40 %
2006	613	449	73.25 %
			<b>On average: 69.67%</b>

Figure 4: Subprime issuance volumes<sup>16</sup>

The subprime mortgage industry is dominated by a relatively small number of lenders. In fact, the top 10 originators controlled over 50% of the subprime market in 2006. Figure 5 shows the origination volumes of the largest subprime lenders in 2006.

<sup>15</sup> Schloemer et al. (2006), p. 3

<sup>16</sup> Chaudhary et al. (2007), p. 3

## Top subprime originators 2006 in billion USD

2006 Rank	Originator	Subprime Volume in USD	Market Share in %
1	HSBC	52.8	8.8
2	New Century	51.6	8.6
3	Countrywide	40.6	6.8
4	Citi Mortgage	38.0	6.3
5	Fremont Investment	32.3	5.4
6	Ameriquest	29.5	4.9
7	Option One	28.8	4.8
8	Wells Fargo	27.9	4.6
9	First Franklin	27.7	4.6
10	Washington Mutual	26.6	4.4
	<b>Total for Top 10</b>	<b>355.8</b>	<b>59.3</b>
	<b>Total for all lenders</b>	<b>600.0</b>	<b>100.0</b>

Figure 5: Top subprime originators 2006 in billion USD<sup>17</sup>

Now, as 68% of Americans can call themselves homeowners the consequences of the U.S. housing market excesses, that were already a topic of speculation over the last couple of years, started to surface. The first signs of slowdown in the very risky subprime market showed up at the turn of the year, as many sub-prime borrowers were not able to make their payments and delinquency and foreclosure rates increased. Among others one of the biggest subprime lenders, New Century Financial, had to file for bankruptcy. Obviously the turn of events over the past months led to concerns about the impact of the subprime crisis on structured finance products, the housing market and the U.S. economy.<sup>18</sup>

The subprime turmoil has led to a barbarous game of fingerpointing, including the most important participants of the mortgage industry all blaming each other of being responsible for the subprime mess. The following figure illustrates the most important participants of the mortgage industry and how they interact.

<sup>17</sup> Wheeler et al. (2007), p.17

<sup>18</sup> Wyss (2007), p. 13

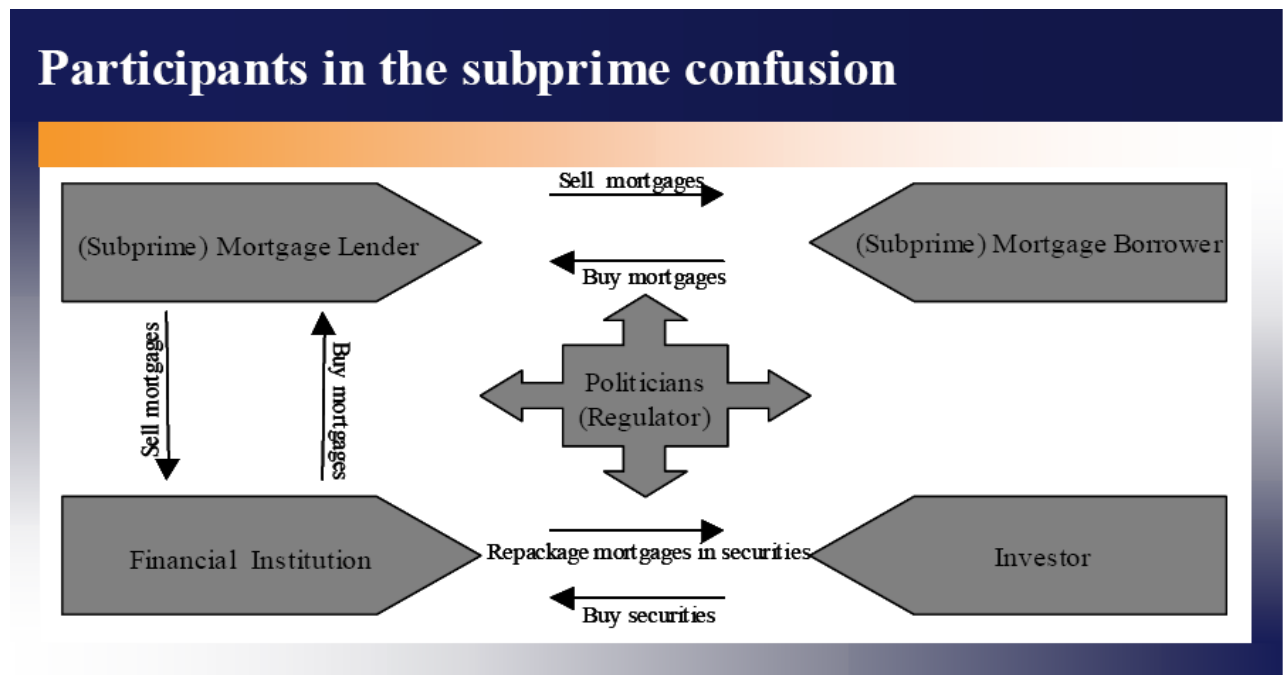


Figure 6: Participants in the subprime confusion<sup>19</sup>

So far, the crisis has been worst for the borrowers that already lost and will lose their homes to foreclosure and especially for the lenders. At least 100 of them already filed for bankruptcy and those institutions that “survived” the first heavy storm still have trouble lined up. Their stockholders, who suffered from huge plunges in the value of their stocks filed lawsuits claiming that they were misled by executives regarding company finances and underwriting guidelines. Moreover many borrowers sued, stating that they were misled about the terms and conditions of their mortgages.<sup>20</sup> Wall Street banks that bought loans from mortgage lenders to repackage them in securities are starting to review their practices and tighten their standards. Those Wall Street banks face enormous lawsuits themselves as investors who lost huge amounts of money in mortgage-backed securities try to sue them for shortcomings in the due diligence of those mortgage lenders. Even borrowers and their mortgage brokers are being accused of fraudulent loan practices but lawsuits against subprime candidates are very unlikely to be profitable. Finally politicians also stepped on the stage, striving for regulations in the US mortgage industry to protect American homeowners that are facing troubles.<sup>21</sup> The following part will shed light on the roots of the subprime lending crisis in more detail and illustrate the roles of the above-mentioned participants.

### 2.3 The roots of the crisis

<sup>19</sup> own illustration

<sup>20</sup> Column (2007)

<sup>21</sup> Column (2007)

## Factors contributing to the subprime crisis

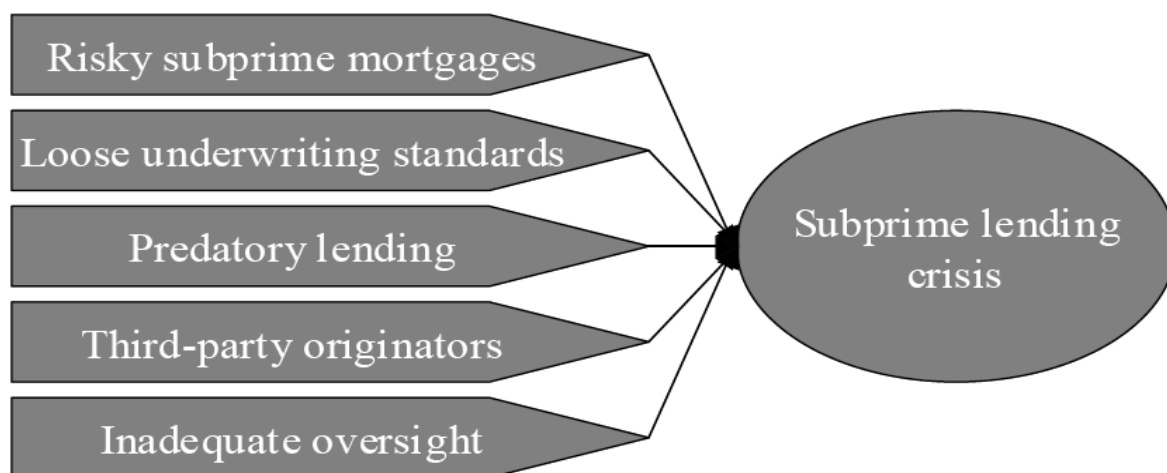


Figure 7: Factors contributing to the subprime crisis<sup>22</sup>

### 2.3.1 Risky subprime mortgages loans

A mortgage is a loan that is used to finance the purchase of real estate where the borrower (mortgagor) is obliged to pay back the lender (mortgagee) with a predetermined set of payments including interest rates. The borrower gives the lender a lien on the property that serves as collateral for the loan.<sup>23</sup>

Mortgage loans are typically classified as either prime or subprime, depending on their credit risk, the risk that a borrower will default on the loan. Prime borrowers, representing the highest quality, are considered to be the most credit worthy borrowers.<sup>24</sup> In contrast to this a subprime mortgage lending is the origination of residential mortgage loans to customers with harmed credit histories. Due to their low credit scores and/or other credit shortcomings they have to pay higher interest rates, points and origination fees to compensate subprime originators for higher default risks and higher servicing costs.<sup>25</sup> Consider the following figure as an example. It reveals how the monthly payments that have to be made on a 30-year mortgage differ as the credit score (credit quality) worsens (increases) and in contrast how good scores save you money.

<sup>22</sup> own illustration with reference to Schloemer et al. (2006), p. 4

<sup>23</sup> Investorwords (2007a)

<sup>24</sup> Investopedia (2007b)

<sup>25</sup> Chaudhary et al. (2007), p. 2

## Fico Score

<b>Fico Score</b>	<b>APR</b>	<b>Monthly payment</b>
760-850	6.383%	\$1,873
700-759	6.605%	\$1,917
660-699	6.889%	\$1,974
620-659	7.699%	\$2,139
580-619	8.970%	\$2,407
500-579	9.925%	\$2,616

*Location: National Average USA, Loan amount: \$ 300,000, Date: 20th July 2007*

Figure 8: Fico Score<sup>26</sup>

There is an overlap between the different categories of mortgages. The technical literature does not provide a clear cut definition for the distinction between prime and subprime but further readings agree that typically the main criteria for this categorization is the credit score of a borrower.<sup>27</sup> The credit score is a numeric expression between 350 and 850, the higher the better, that lenders use to evaluate the creditworthiness of a potential borrower. The most common scoring system in this industry is the FICO score. FICO stands for Fair Isaac Corporation, the organization that offers these credit scores to financial institutions.<sup>28</sup> The FICO score is based on five pillars, each weighted differently, which can be seen in the following figure.

<sup>26</sup> myFico (2007), APR: For scores above 620, these APRs assume a mortgage with 1.0 points and 80% Loan-to-Value Ratio. For scores below 620, these APRs assume a mortgage with 0 points and 60 to 80% Loan-to-Value Ratio. Assumes mortgage is for a single family, owner-occupied property.

<sup>27</sup> Wheeler et al. (2007), p. 6

<sup>28</sup> Investopedia (2007c)

## General categories of the Fico Score

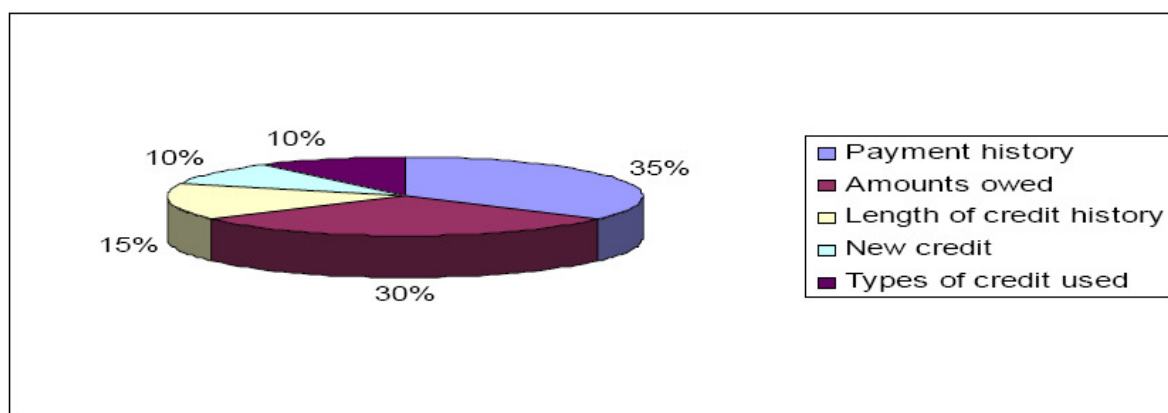


Figure 9: General categories of Fico Score<sup>29</sup>

Despite its common usage, the prime-subprime categorization is not explicitly defined and there is still some confusion regarding a precise characterization of subprime lending. This gets even more difficult when a third type of mortgage is considered, the Alt-A mortgage. These mortgages are often provided to borrowers with a lack of documentation (for example self employed borrowers whose tax returns do not really reflect their incomes). In general, a borrower with a credit score of less than 620 falls in the subprime territory, an Alt-A borrower has a credit score that normally falls between 620 and 700 and every-thing that is higher is prime quality.<sup>30</sup> According to “Inside Mortgage Finance”, mortgages worth USD 3 trillion were originated in the US mortgage market. Subprime mortgages had a market share of around 20 % with USD 600 billion and Alt-A mortgages a share of 13 % with USD 400 billion originated.<sup>31</sup>

As mentioned before there is no legislative regulation for the term subprime, which makes regulation attempts in the subprime sector, as they can be currently observed, so difficult. Another consequence is that borrowers might receive different quotes for mortgages from different lenders as they all use different models to assess the risk of providing a loan.<sup>32</sup> In addition to the credit score other variables such as the loan-to-value ratio that compares the loan balance with the value of the securing property are considered.

### 2.3.1.1 Adjustable-rate mortgages

In a fixed-rate mortgage the interest rate stays the same until maturity while in an adjustable-rate mortgage the interest rate is linked to an economic index. The index is used by lenders to measure the changes in interest rates and thus in the lending rates. On the one hand this means that borrowers can save money in an environment of falling interest rates but on the other hand interests might rise which

<sup>29</sup> myFico (2007)

<sup>30</sup>Wheeler et al. (2007), p. 6

<sup>31</sup>Inside Mortgage Finance (2007)

<sup>32</sup> Bankrate.com (2007)



leads to higher payments for the borrower as the interest rates and the payments in a mortgage are periodically adjusted to changes in corresponding index. In most deals Libor or one to five year treasury rates serve as benchmark rates.<sup>33</sup>

ARM mortgages are the dominant product in the subprime mortgage sector and represent 40 % of the whole origination volume. IO ARMs make up 15 % of the distribution volume. An IO loan (Interest-only loan) is a loan where only interest payments have to be made and the full principal is due at maturity<sup>34</sup> Fixed rate and IO fixed rate mortgages together represent 18% of the market while the share of 40/30 ARM mortgages interestingly grew to 19%. For these mortgages the monthly payments are calculated on 40-year loan term but the loan must be paid off after 30 years. The advantage of these loans is that monthly payments are lower but the catch is that the remaining loan balance must be paid after 30 years. In most cases this balloon payment is approximately half the original mortgage, which causes huge payment shocks for borrowers<sup>35</sup>.

More than 80 % of all originated ARM subprime loans are “2/28” hybrids, which means that they have a fixed-rate period at the beginning of 2 years and for the last 28 years interest rates are reset semiannually according to the benchmark economic index. Moreover “3/27” hybrids are frequently issued but other terms in subprime ARMs are unusual.<sup>36</sup>

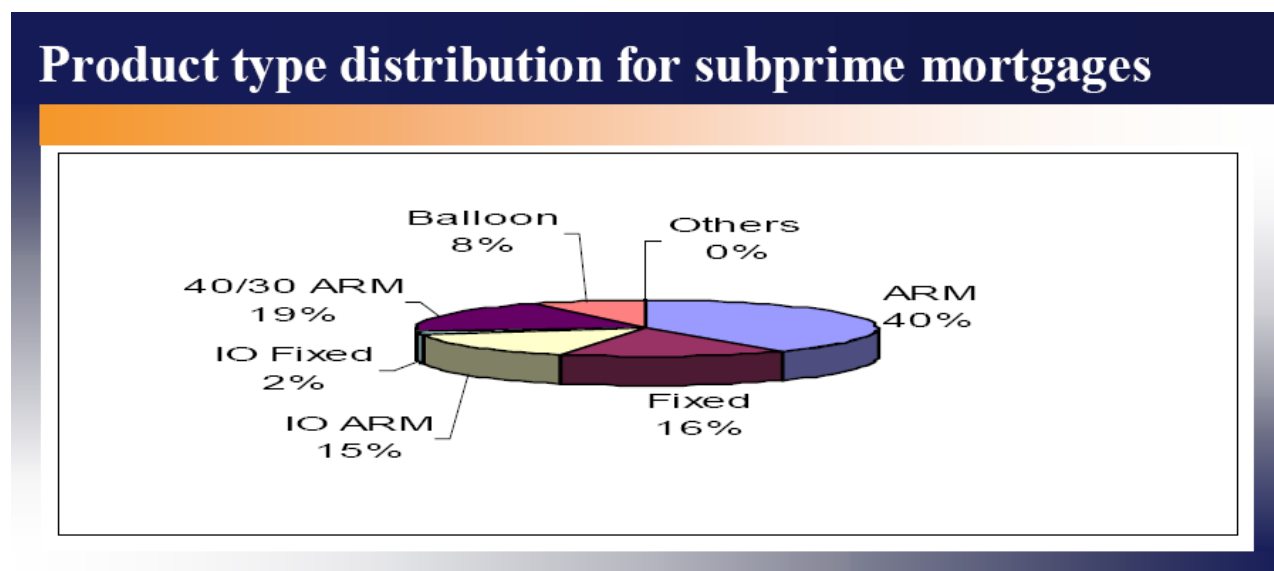


Figure 10: Product type distribution for subprime mortgages<sup>37</sup>

Before the subprime problems first surfaced in the second half of last year and home prices started to shrink, there was a boom on the housing market until the end of 2005 in which home price increases outpaced income gains.<sup>38</sup> The rise in home prices also made mortgages more expensive and housing became less affordable.

That is why borrower’s preferences were shifted to ARM mortgages, as their initial fixed rate or “teaser” rate was often low. The problem was that many borrowers found themselves in huge financial

<sup>33</sup> Wickell (2007)

<sup>34</sup> Investorwords (2007b)

<sup>35</sup> Lansner (2007)

<sup>36</sup> Chaudhary et al. (2007), p. 8

<sup>37</sup> Chaudhary et al. (2007), p. 8

<sup>38</sup> Wyss (2007), p. 16-17

troubles after the new terms of their mortgage contracts became effective and the interest rates of the contracts readjusted after two or three years. They could not afford the mortgage payments anymore and delinquencies and foreclosures were on the daily agenda.<sup>39</sup> Because of the resulting payment shock these ARM mortgages are often referred to as “exploding ARMs” ;

The following figure underlines how much ARMs contribute to the subprime lending crisis. At the moment foreclosure rates are evidently getting most of the attention and it is worth to dig a bit deeper to see that the prevailing problems in the subprime sector mainly stem from adjustable-rate mortgages. In the subprime fixed-rate segment delinquency and foreclosure rates leveled off at low rates. At the same time a major increase in foreclosure and delinquencies can be observed for prime ARM which leads to the conclusion that the current crisis is more an ARM crisis than a subprime crisis.<sup>40</sup>

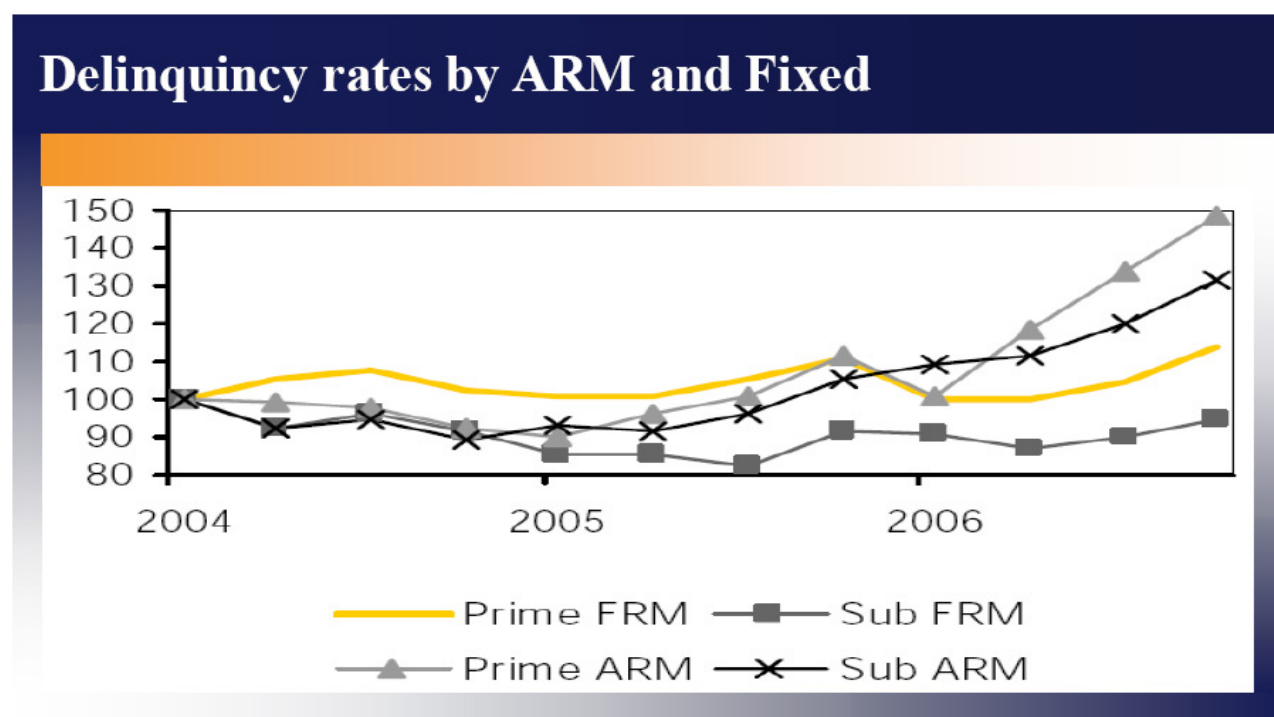


Figure 11: Delinquency rates by ARM and Fixed<sup>41</sup>

### 2.3.2 Predatory lending

Predatory lending practices are considered to be actions performed by lenders in order to attract low-income individuals. Using targeted marketing and promises of “easy credit” and “quick cash”, predatory lenders entice a borrower in taking a mortgage that can trap the borrower in a cycle of high interest rates, abusive fees or puts the borrower in a lower credit rated loan to the benefit of the lender.<sup>42</sup> These practices often lead to foreclosures and eventually ruin the borrower’s financial future. Especially subprime borrowers that do not have many lending options are vulnerable to these

<sup>39</sup> Wheeler et al. (2007), p. 6

<sup>40</sup> Wyss (2007), p. 15

<sup>41</sup> Franke (2007), p. 3

<sup>42</sup> Investopedia (2007d)

predatory products.<sup>43</sup> A predatory mortgage loan can often be identified by the following terms and activities.

## Characteristics of a predatory mortgage loan

- **Excessive points and fees:** If the amount that is paid for points and fees is higher than five percent of the total loan amount they are considered to be excessive.
- **Prepayment penalties:** Fees, that a borrower has to pay if the loan or the majority of the loan is repaid before a preset time period are called payment penalties.
- **Loan flipping:** Refinancing loans without a net tangible benefit to borrowers, in order to take out additional fees and charges.
- **Steering:** Borrowers are enticed to take more expensive loans than they could qualify for.
- **Financed credit insurance:** Financing mortgage insurance through a lump-sum payment folded into the mortgage loan.

Figure 12: Characteristics of a predatory mortgage loan<sup>44</sup>

Over the last years several lenders in the subprime mortgage industry have been successfully sued for predatory lending. They manage to attract borrowers with low initial payments without even considering if future payments can be made. High costs and prepayment penalties even increase the danger of early foreclosure.<sup>45</sup> The problem is that loose underwriting standards and inadequate oversight in the mortgage industry make it fairly easy for these shady lenders to run these predatory lending practices.

### 2.3.3 Third-party originators and loose underwriting

Loose underwriting standards and the concept of third-party origination even boost the risk of subprime mortgages that already contain exceptional risk features.

The lending process in the subprime industry cannot be compared to traditional lending, as there are significant differences. Most mortgages are originated through brokers and only few loans through retail channels. In general, mortgages are originated through one of the three channels that are illustrated in the following figure.

<sup>43</sup> Carsey Institute (2006), p.1

<sup>44</sup> Carsey Institute (2006), p.2

<sup>45</sup> Schloemer et al. (2006), pp. 3-5

## Subprime origination channels in 2006

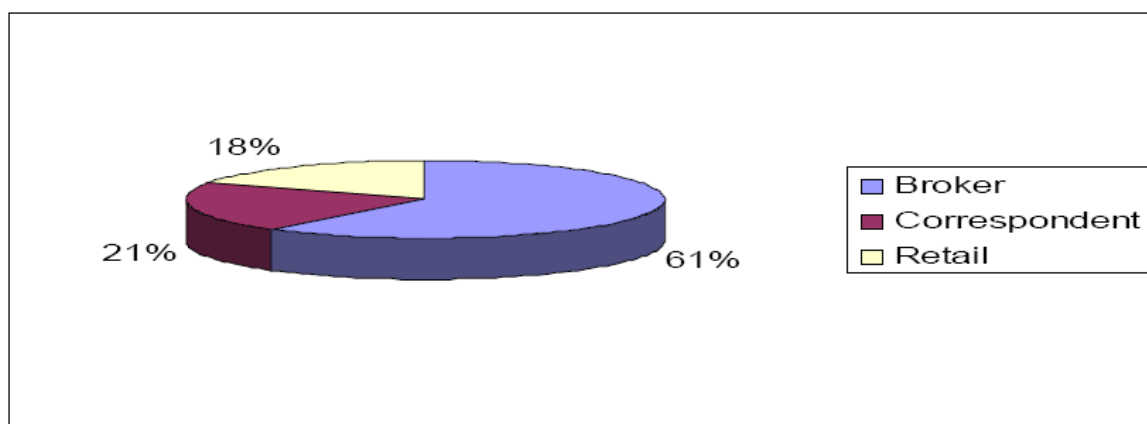


Figure 13: Subprime origination channels in 2006<sup>46</sup>

The problem with mortgage brokers is that their prior motivation is the quantity of the loans they sell and not the quality. They act as agents and simply bring lenders and borrowers together for what they charge a fee that is normally paid by the borrower. They have very little reason to consider the future performance of the mortgage. Lenders protect themselves from possible future foreclosures by selling the loans to investors on the secondary market.<sup>47</sup>

In contrast to brokers, correspondents are also responsible for the underwriting process and the initial funding of the mortgage. Brokers and correspondents have in common that the originator of the mortgage has no direct contact with the borrower. For that reason both processes are called “wholesale originations”. The originator only has direct contact to the borrower in the retail channel via telephone, internet or outlets. As the originator is directly involved in the underwriting process this distribution channel is reckoned as the least risky one.<sup>48</sup>

As the subprime lending segment grew significantly over the past years and more and more subprime mortgages were sold it is obvious that subprime lenders largely depend on secondary mortgage markets and securitization for liquidity.

Most of the originators that specialize particularly in subprime lending securitize the loans that they issue by themselves or sell the originated loans as whole loans in the secondary market. Some lenders, for example HSBC, that are branches of huge and well rated depositary institutions with access to cheap funding through deposits can easily portfolio their originations.<sup>49</sup>

### 2.3.4 Inadequate oversight

The landscape in the subprime lending sector is marked by inadequate regulatory and legal oversight for mortgage lenders. There are no clear-cut universal laws governing subprime lending. Instead regulatory institutions address improper and questionable lending practices that fall in the

<sup>46</sup> Chaudhary et al. (2007), p. 4

<sup>47</sup> Schloemer et al. (2006), pp. 3-5

<sup>48</sup> Chaudhary et al. (2007), p. 4

<sup>49</sup> Chaudhary et al. (2007), p. 4

category of predatory lending. Before and in the course of the crisis, regulators issued some new guidelines to tighten underwriting practices and to confine predatory lending practices.<sup>50</sup> These subprime guidelines essentially strive to protect borrowers by demanding a clarification of risks/benefits of the different loans like balloon payments, payment shocks and prepayment penalties. Additionally, lenders are required to examine the borrowers creditworthiness according to all relevant credit factors in detail before approving a loan. Furthermore they have to install internal monitoring systems that allow regulators to control if lenders stick to the guidelines.<sup>51</sup>

However, there are insufficient legal consequences and penalties for selling mortgages that are not appropriate or affordable for the borrower. This stems from a large number of loopholes in the regulations that allow lenders to escape these regulations. The biggest problem is that there is no universally accepted definition for subprime lending.<sup>52</sup>

Consider for example the most important federal regulatory framework in the U.S. that targets unfair lending practices in the mortgage industry, which is called Homeownership and Equity Protection Act (HOEPA). HOEPA covers “high cost loans”, which are defined as loans where the annual percentage rate (APR) exceeds the Treasury rate of a comparable maturity by a specified amount and/or the points and fees rise above 547 USD or 8% of the loan balance. The law imposes considerable restrictions and penalties in case of violations for all loans that fall under these guidelines. The problem is that this guideline does not apply to all risky loan products like a home equity line of credit (HELOC) or a purchase loan.<sup>53</sup>

Even more problematic is that not only the types of loans that fall under the regulatory guidelines are limited but also the number of banks is limited. Mortgage lenders are either depository institutions like HSBC (commercial banks, credit unions) or non-depository institutions like Ameriquest (securities firms and finance companies). The most striking fact is that non-bank subsidiaries of holding companies, that made up around two third of the subprime mortgage market, are not federally supervised.<sup>54</sup> This example from the federal perspective reveals how confusing the situation is and how many loopholes this system offers participants in the mortgage industry.

HOEPA is the only federal guideline that supervises predatory lending but there are several other laws on the federal and on the state level that target these problems. This makes it so difficult to keep track of all the different amendments and developments in these regulations and in how far these guidelines cover the problems in the subprime lending industry.

This led to a massive public discussion involving politicians that want to protect American homeowners. This includes for example senator Hillary Clinton who demands strengthening federal regulations and protections and to make them more concise or Senator Charles Schumer calling for a national regulation for mortgage brokers including non-bank entities, that were often excluded from regulations as mentioned earlier.<sup>55</sup> Of course there is an opposition to these positions, mainly represented by some mortgage lenders and economists arguing that too much regulation will decrease accessibility and affordability to loans, and respectively that subprime markets already started disciplining themselves due to the bad experiences from recent months. This debate about regulatory attempts will be expatiated in the last part of this paper when it comes to answering the question how the difficult subprime issues should be handled to get them under control.

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<sup>50</sup> Schloemer et al. (2006), pp. 3-5

<sup>51</sup> Wheeler et al., pp. 27-28

<sup>52</sup> Chaudhary et al. (2007), p. 28

<sup>53</sup> Chaudhary et al. (2007), p. 29

<sup>54</sup> Chaudhary et al. (2007), p. 29

<sup>55</sup> Wheeler et al. (2007), pp. 25-27

## 2.4 Key findings

Before we move on to the securitization of mortgages in the next chapter the following list summarizes the key findings of this chapter:

- Slowdown in house price appreciation weakens the values of the properties that secure the mortgages
- ARM mortgages bear the risk that readjusted coupons in an environment of rising interest rates result in payment shocks, which accelerates delinquencies and defaults.
- Subprime borrowers are extremely vulnerable to predatory loans, as they do not have many borrowing alternatives.
- Poor regulation made it easier for predatory lenders to increase their market shares in the mortgage industry.

## 3 The securitization process of mortgages

### 3.1 Securitization

Every time a person or a corporation makes a promise to pay, a financial asset is born. The promise can include the purchase of an asset or a service. Moreover it can also involve to repay a loan used to acquire assets or services. In all cases the value of the promise as a financial asset depends on the capability and the willingness to keep the promise. The full collection of these promises represents the raw material for the securitization market.<sup>56</sup> As the focus of this paper is on mortgage subjects, the securitization process will be described on the basis of loans. But as indicated before, there is a massive variety of financial assets that can be securitized, most commonly credit card receivables, home equity loans, student loans, leases or securitized issues that are pooled together and securitized again.

Securitization is one of the most important and groundbreaking innovations in global financial markets. A complex constitution of loan originators, funders, securities conduits, credit enhancers, investment bankers and domestic and global investors are displacing and altering the traditional lending cycle that consists of portfolio lenders, local thrifts and banks that gather deposits and lend them to those who are looking for credit.<sup>57</sup>

So what is securitization, how does it work and how do participants that are involved in the securitization process benefit? It can be described as a process whereby illiquid financial assets of a corporation or financial institution are transformed into a package of securities, through careful packaging, credit enhancements and structuring. Then they are underwritten and sold to investors in the form of marketable and tradeable securities, instruments generally known as asset-backed securities. The big advantage for issuers and investors is that securitization enables bonds to be created from any kind of cash flow. It allows the issuer to free capital and utilize the proceeds of the sale of

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<sup>56</sup> Davidson (2003), p.3

<sup>57</sup> Kendall (2000), pp. 1-2

the loans to originate more loans. The interest and principal payments of the debt obligations that are put together in a pool are used to service the new bond issue.<sup>58</sup>

The following figure shows the most common types of securities resulting from securitization and the different financial assets that back them. Eventhough all these securities stem from the same principle of securitization and are often listed under the umbrella of asset-backed securities it is very important to differentiate between them. Asset-backed securities for example are by definition backed by non-mortgage assets like credit card receivables, auto loans, leases, student loans etc.<sup>59</sup> As the name states a mortgage-backed security is an interest in a pool of residential or commercial mortgages while CDOs hold all kinds of bonds and loans in the collateral offering investors different maturities and credit risks. This will be discussed in more detail later on in this paper, for now it is generally important to understand the idea behind securitization.

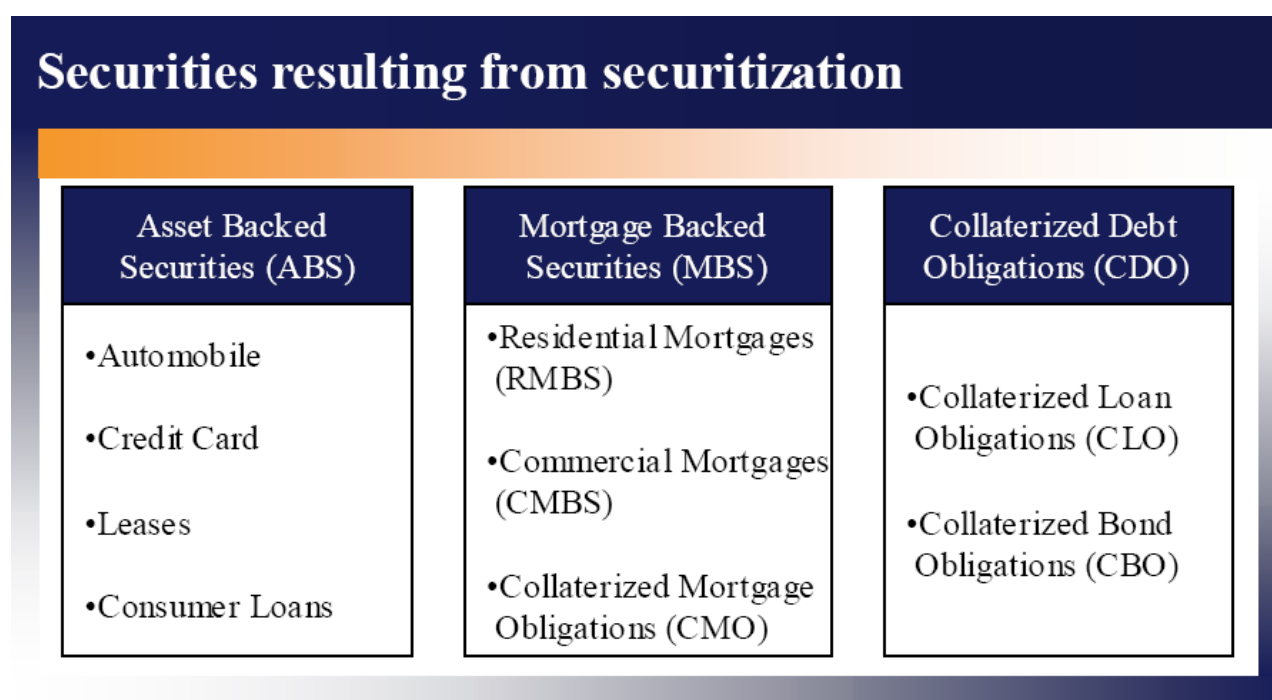


Figure 14: Securities resulting from securitization<sup>60</sup>

The securitization process, its participants and the basic steps it takes to create a securitized issue are illustrated in figure 15. The borrower receives the funds from the lender who may service the loans as well or assign this task to a third-party entity. Servicing includes the collection of payments and arrangements to assure that the borrower meets the obligations of the loan. Moreover the servicer is responsible for protecting the rights of investors in the collateral throughout the life of the contract. If the loan originator has a critical mass of loans on its books it creates a distinct legal entity called special purpose vehicle (SPV) that purchases these loans to isolate them from other assets that are in the books of the loan originator. The bundle of loans may also be sold to a specialized securities firm that installs the SPV.

The special purpose vehicle (trust) manages the collateral, issues the securities that are backed by the collateral and forwards interest and principal payments to the investors. It has to be guaranteed that the owners of the securities have a claim of the highest priority against the loans that back the

<sup>58</sup> Choudhry (2005), pp. 214-216

<sup>59</sup> Riskglossary (1996)

<sup>60</sup> Investitionsbank SH (2007), p. 4 26

securities. This claim must be established in a way that the loans are protected against governmental liens or demands of creditors that might arise against the loan originator in the event of a bankruptcy. The SPV structure is applied in securitizations because the segregation of these risks from the securitized assets is achieved by the sale of the loans to the special purpose vehicle.<sup>61</sup>

Since the issued securities are rated, rating agencies are also involved in this process. They assess the likelihood that the SPV will default on its obligations and assign an appropriate credit rating. In the case of agency mortgage-backed securities investors do not call for ratings as the U.S. government or government agencies commonly back these securities.<sup>62</sup> The underwriter, for example an investment bank, administers the issuance and distribution of securities, which are purchased by investors who provide funding for the debt obligations that were sold by the lenders.<sup>63</sup> Furthermore securitization might include credit enhancement, which reduces credit risk by requiring collateral or by buying insurance. Credit enhancement is provided by independent third parties in the form of letters of credit or guarantees and reassures the lender/investor that they will be compensated if the borrower defaults.<sup>64</sup> The issued securities are liquid market instruments that can be traded on the secondary market in any desired frequency.

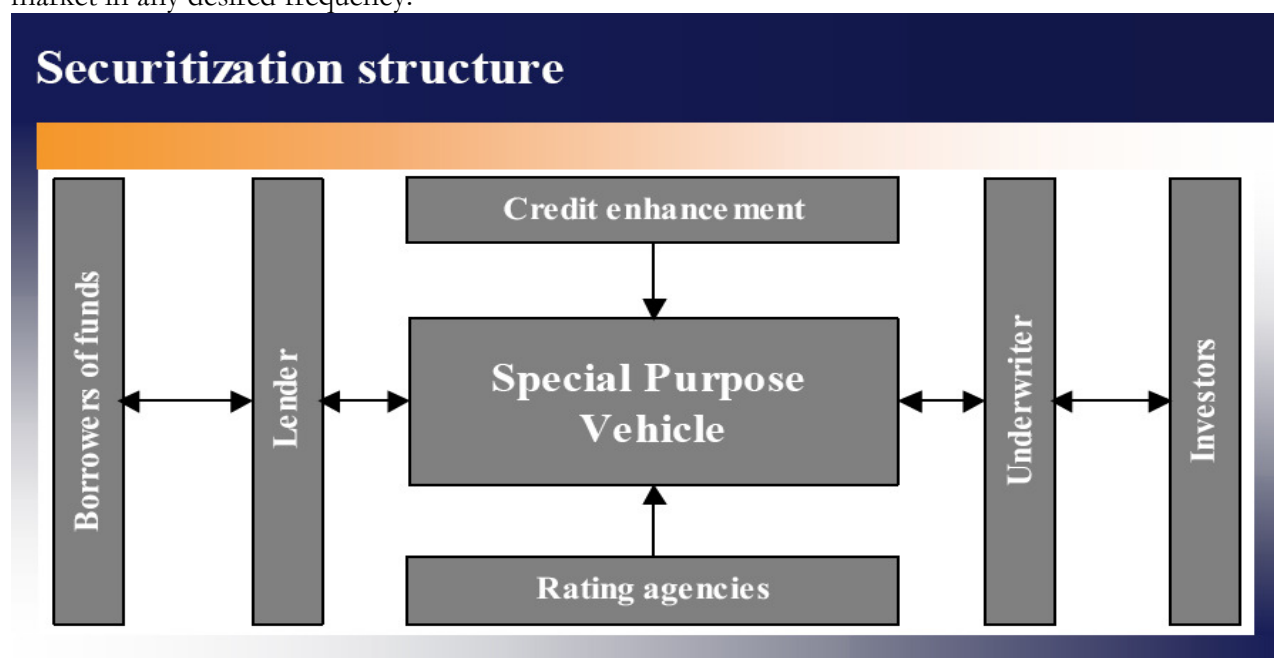


Figure 15: Securitization structure<sup>65</sup>

### 3.1.1 Motivations for securitization

From the financial perspective the first decision a loan originator has to deal with is whether he wants to sell the assets outright or securitize them. Selling has the advantage that the risks are transferred to the buyer right away and that the costs of those transactions are commonly cheaper. In securitizations several tranches are created and the issuer may have to retain some tranches, typically the most risky ones. The issuer has to determine if the proceeds from securitization, considering the value and risk of retained tranches, is more attractive than an outright sale.

<sup>61</sup> Roever (1999), p. 4

<sup>62</sup> Kendall (2000), pp. 1-4

<sup>63</sup> Bair (2007)

<sup>64</sup> Investorwords (2007c)

<sup>65</sup> own illustration with reference to Bair (2007)



If the issuer views securitization as a source of financing he has to find out whether the costs of a securitization, including coupon payments to investors, administrative fees and underwriting costs, are more favorable than funding through corporate debt and equity. Firms that have high-quality assets on their balance sheet might be able to reduce financing costs through securitization because securities backed by these high quality assets may offer a better credit quality than general obligations of the firm.<sup>66</sup> In any case securitization allows issuers to diversify their financing sources because it provides alternatives to traditional kinds of debt and equity financing.

From the regulatory perspective securitization is particularly interesting for regulated financial institutions because they traditionally have several capital requirements. As rated securities commonly have lower capital requirements than unrated pools of loans, securitization may permit corporations to reduce its capital requirements. This issue recently got even more attention regarding the implementation of the new Basel II regulations at the beginning of 2007. However a corporation that decides to securitize a portfolio of loans has to consider that the effect of lower capital requirements, resulting from the issuance of rated tranches, may be offset by retained risky residual tranches that increase capital requirements.<sup>67</sup>

From the accounting perspective securitization may advance managerial control over the size and structure of the corporation's balance sheet. For example measures of economic performance (return ratios) and gearing ratios can be improved because of accounting de-recognition of assets (assets are removed from the balance sheet). Moreover financial institutions securitize to attain capital adequacy targets, especially in cases where assets are in default or performing below the expected yield.<sup>68</sup> Securitization affects the capital of a corporation. Firms are normally limited to the amount of leverage they have, which is the degree of debt financing on their balance sheet. Securitization may allow firms to issue more debt, hence they can increase their leverage and free equity for other investments. From the issuer's strategic standpoint securitization can increase the origination of loan products (like subprime mortgages) that they would otherwise be unable to sell or to keep on the balance sheet. This is possible because securitization enlarges the range of investors for particular types of (risky) loans. Hence a corporation can stretch underwritings and originations without ballooning the balance sheet excessively. In order to save all the costs associated to securitization an alternative would be to sell the loans to specialized finance and securitization firms instead of securitizing the loans directly. This would mean that control over the securitization process would be lost, hence it would strategically make sense to continue to securitize loans on the own account even if selling them may currently offer more economic benefit.<sup>69</sup> Securitization and structured finance vehicles can also be used for tax management but as this is not relevant for the purpose of this paper it will not be further discussed.

### 3.2 Mortgage-backed securities

For years mortgages have been securitized in the form of mortgage-backed securities resulting in a huge secondary market for those assets. They can be subdivided into residential mortgage-backed securities (RMBS), MBS backed by mortgages on residential property and commercial mortgage-backed securities (CMBS), MBS backed by mortgages on commercial property. They are debt obligations that represent an interest to the cash flows from pools of mortgage loans, typically on residential property. The loans are bought from banks, mortgage companies and other loan originators and then put together into pools by governmental, quasi-governmental or private entities.<sup>70</sup> Take for

<sup>66</sup> Davidson et al. (2003), pp. 15-16

<sup>67</sup> Kravitt (1997), pp. 28-30

<sup>68</sup> Pisauro (2007), p. 5

<sup>69</sup> Tavakoli (2003a), p. 14

<sup>70</sup> U.S. Securities and Exchange Commission (2007)

example a lending institution that has hundreds or thousands of single residential and commercial mortgages on its books. When these mortgages are put together and used as collateral for a bond issue, mortgage-backed securities result. In the U.S. market you can distinguish between agency and non agency mortgage-backed securities. Agency mortgage-backed securities are backed by the government or government agencies. Two government-sponsored agencies, Freddie Mac (Federal Home Loan Corporation) and Fannie Mae (Federal National Mortgage Association), and one government agency commonly known as Ginnie Mae (Government National Mortgage Association) buy mortgages to pool and keep them in their portfolios and possibly securitize.<sup>71</sup> These agencies typically guarantee the interest and principal payments on their securities and are considered to offer strong credit quality due to their access to lines of credit from the U.S. treasury. Securities issued by Ginnie Mae are even backed by the full faith of the U.S. government.<sup>72</sup> The mortgage loans in the collateral of agency-MBSs have to fulfill certain criteria as for example a limited loan size, a maximum LTV and a minimum credit score. That is why agency securities are basically risk-free instruments and therefore not rated by rating agencies.

Non-agency mortgage-backed securities that are issued by private entities are rated in the same way as other corporates as the pool of mortgage loans, by which they are backed, may also include loans that do not satisfy the requirements to qualify for agency-MBSs.<sup>73</sup> The collateral of non-agency-MBSs consists of debt obligations like

- **Jumbo loans** (Loan size too big for agency-MBSs)
- **Subprime** (Credit score and credit quality too low)
- **Alternative A** (Low documentation, low credit quality)
- **Reperforming FHA/VA** (Delinquent loans that start to perform again)
- **Scratch and Dent** (Lowest possible credit quality)<sup>74</sup>

Those securities that are issued by nongovernment entities are rated and in most cases they obtain credit insurance / credit enhancement for their issues in order to boost credit quality. The most important measure for investors to value their investment in mortgage-backed securities is yield, which expresses the return as an annual percentage. MBSs have consuetudinarily been very appealing to investors as they make payments to the bondholders on a monthly basis. This guarantees steady income unlike most other securities that pay coupons annually or semi-annually. Furthermore they normally trade at a spread to Treasury and corporate bonds of comparable maturity and credit quality, because they are not only exposed to credit and interest rate risk but also to prepayment risk. This risk arises because in many cases borrowers can choose to repay the principal earlier than defined in the loan contract. Reasons for prepayment include the sale of the property that secures the mortgage, a change in interest rates that makes refinancing the mortgage attractive and a destruction of the property.<sup>75</sup> Even though MBS investors still get their money, early redemption is considered to be a risk as it may affect the amount and timing of interest payments and MBS yields. Furthermore prepayment occurs when interest rates fall and the fixed income of the bond would be worth more<sup>76</sup>.

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<sup>71</sup> Choudhry (2005), p. 244

<sup>72</sup> The Bond Market Association (2007a)

<sup>73</sup> Choudhry (2005), p. 244

<sup>74</sup> Smisch (2007), p. 26

<sup>75</sup> Choudhry (2005), p. 248

<sup>76</sup> Kelman (2002), pp. 1-3

It is very important to consider prepayment assumptions when mortgage-backed securities are valued. Even though it is impossible to measure the prepayment likelihood of a single mortgage, this analysis is absolutely reasonable for a large amount of mortgages that are put together in the collateral. Earlier than expected returns of principal increase the yield on securities that were purchased at a discount, but if securities were bought at a premium, earlier than expected returns of principal reduce yield.

There are many different techniques and ways how mortgages can be securitized. Figure 16 shows the most common types of mortgage-backed securities that will be explained in the following sub-chapters.

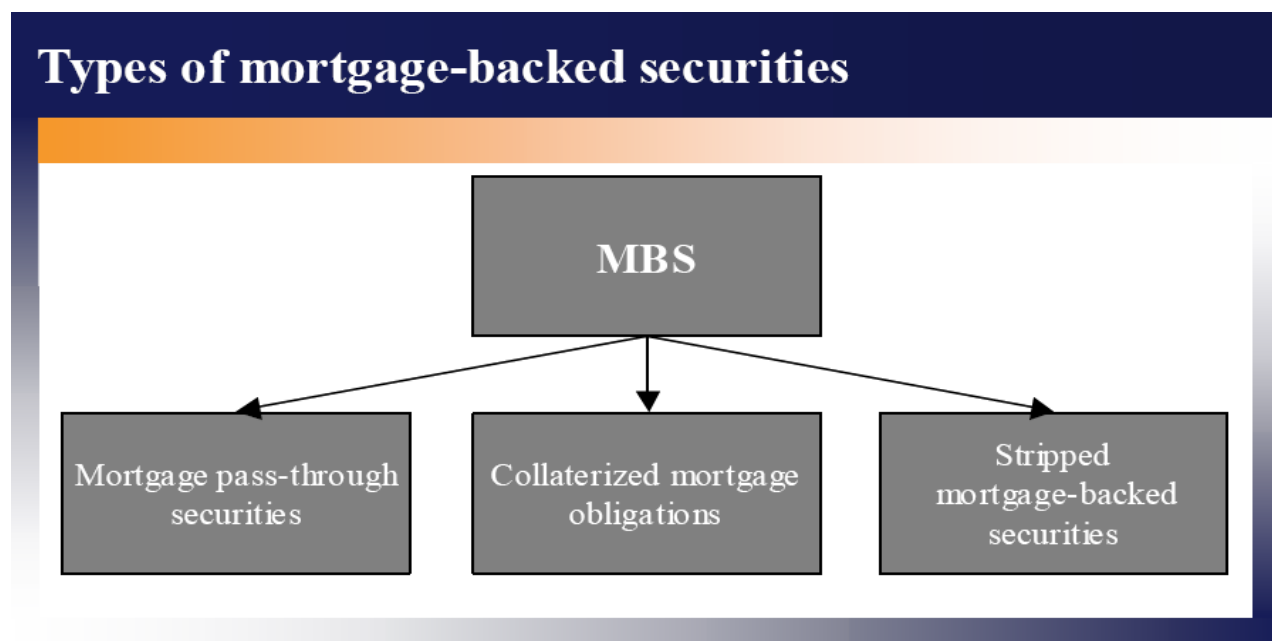


Figure 16: Types of mortgage-backed securities<sup>77</sup>

### 3.2.1 Mortgage pass-through securities

Mortgage pass-through securities are the simplest MBSs and are essentially, as described above, a securitization of mortgage payments. They are created when holders of mortgages form a pool of mortgages and sell shares or participation certificates in the pool. The cash flows of a pass-through depend on the underlying collateral which is composed of monthly mortgage interest and principal payments and prepayments.<sup>78</sup> Investors receive a pro rata share of the distributions based on their interest in the assets, for example if an investor owns two percent of the mortgage pool, he receives two percent of all principal and interest payments less fees.

The mortgages in the pool are all very similar or even alike but since they do not have the exact same mortgage rate and maturity a weighted average coupon (WAC), a weighted average maturity (WAM) and a weighted average loan age (WALA) are calculated to characterize the collateral. Investors receive what is called net coupon, which is the WAC.<sup>79</sup>

<sup>77</sup> own illustration

<sup>78</sup> Fabozzi et al. (2005), pp. 17-18

<sup>79</sup> Kolev (2004)

Consider for example a pool of mortgages with 1000 loans, each worth USD 200,000. Interest payments, principal payments and prepayments (prepayment risk) are the three sources of cash flow. If an investor holds one individual mortgage loan it is very difficult to predict payments, yet if all 1000 loans are pooled together it is easier to estimate prepayments on the basis of historical experiences. Even though the total prepayment risk does not change, it is more desirable to hold a share (security) in the whole pool of mortgages that exposes you to prepayment risk spread over 1000 loans rather than being exposed to one single mortgage.<sup>80</sup>

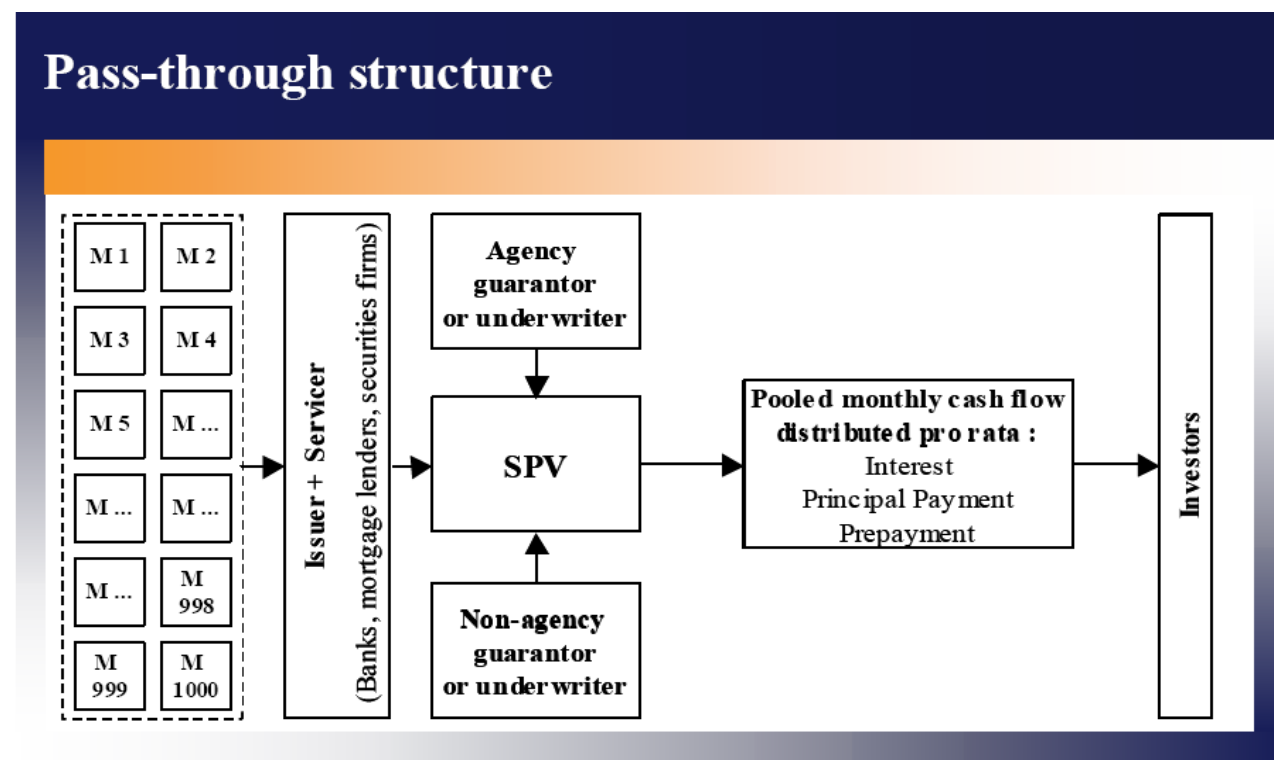


Figure 17: Pass-through structure<sup>81</sup>

### 3.2.2 Collateralized mortgage obligations

A collateralized mortgage obligation (CMO) is a more complex MBS and was created to diversify the range of mortgage-backed products to traditional fixed income investors. The collateral may consist of one or more pass-throughs, a pool of mortgage loans that have not yet been securitized or a mix of both. A CMO differs from a pass-through in that the issued securities are ordered into tranches with varying maturities and amortization schedules. Investors do not share the prepayment risk equally like in pass-through structures, in CMOs it is distributed differently among the tranches.<sup>82</sup> The cash flow distributions to the investors are prioritized, based on the different tranches they hold. The coupons (interests) are paid to investors at the same time unlike the principal repayments. All scheduled and unscheduled principal payments go first to investors in the first tranches. Investors in subordinated tranches do not start receiving principal payments until the prior tranches are paid off.

Consider the following example. USD 100 million are issued through a CMO structure. USD 60 million belong to class A, USD 25 million to class B and the rest to class C. Class A holders get all

<sup>80</sup> Fabozzi / Ramsey (1999), pp. 2-4

<sup>81</sup> own illustration with reference to Kendra / Costello (2007), p. 7

<sup>82</sup> Stone / Zissu (2005), pp. 81-83

principal payments until the bond retires, after which class B receives all the payments followed by the last and most subordinated tranche C. Hence bond A has the shortest maturity and the highest credit rating while C bonds have the longest maturity and the lowest credit rating.<sup>83</sup> The distribution of the principal payments and the interest payments follows rules that are defined in the prospectus. It was the prepayment uncertainty of mortgage-backed securities that led to the development of collateralized mortgage obligations. The redirection of cash flows from the collateral enables issuers to create different classes of bonds that have different degrees of credit risk, prepayment risk and interest rate risk. This structure is more appealing for institutional investors as their investment strategies pursue to satisfy asset/liability objectives. In pass-throughs investors often end up with a different maturity than expected due to a higher uncertainty of cash flows while CMOs offer various maturities. Pension funds and life insurance companies are looking for instruments with long maturity, banks and thrifts are seeking for short term investments.<sup>84</sup>

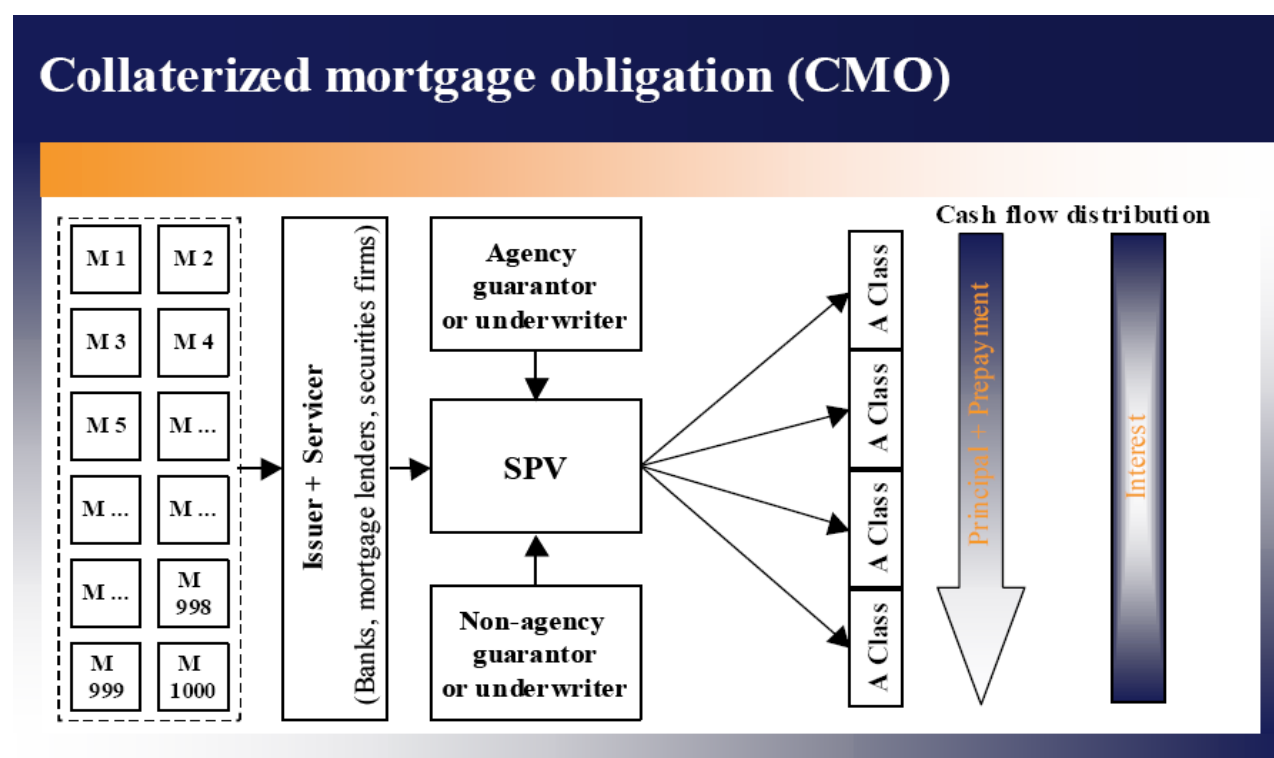


Figure 18: Collateralized Mortgage obligation<sup>85</sup>

### 3.2.3 Stripped mortgage-backed securities

A pass through distributes the cash flows from interest and principal payments from the underlying pool of mortgages on a pro rata basis to the bondholders. Stripped-mortgage backed securities modify the distribution of cash flows from a pro rata distribution to an asymmetric distribution. The most common type of these securities is often referred to as interest-only/principal-only security. All the interest payments are disposed to the interest-only class and all the principal repayments are allocated to the principal-only class. Hence The IO class does not get principal payments and the PO class does not receive interests.<sup>86</sup>

<sup>83</sup> Choudhry (2005), p. 249

<sup>84</sup> Fabozzi et al. (2005), pp. 17-18

<sup>85</sup> own illustration with reference to Kendra / Costello (2007), p. 7

<sup>86</sup> Fabozzi et al. (2005), pp. 18-19

Consider the following scenario. In an environment with rising interests prepayments will decrease which means that the average maturity (average life) of the bond will increase. Thus the value of the IO class will appreciate because of more cash flows from interest payments. The value of the PO class will depreciate because the pace of principal repayments will slow down. This scenario works contrariwise in an environment of falling interest rates.<sup>87</sup>

These risk and return characteristics suggest that these instruments are well suited for hedging purposes. For example if you expect an increase in interest rates and you have a bond that loses value in this scenario you can hold IO classes of stripped mortgage-backed securities as they appreciate when interests rise.

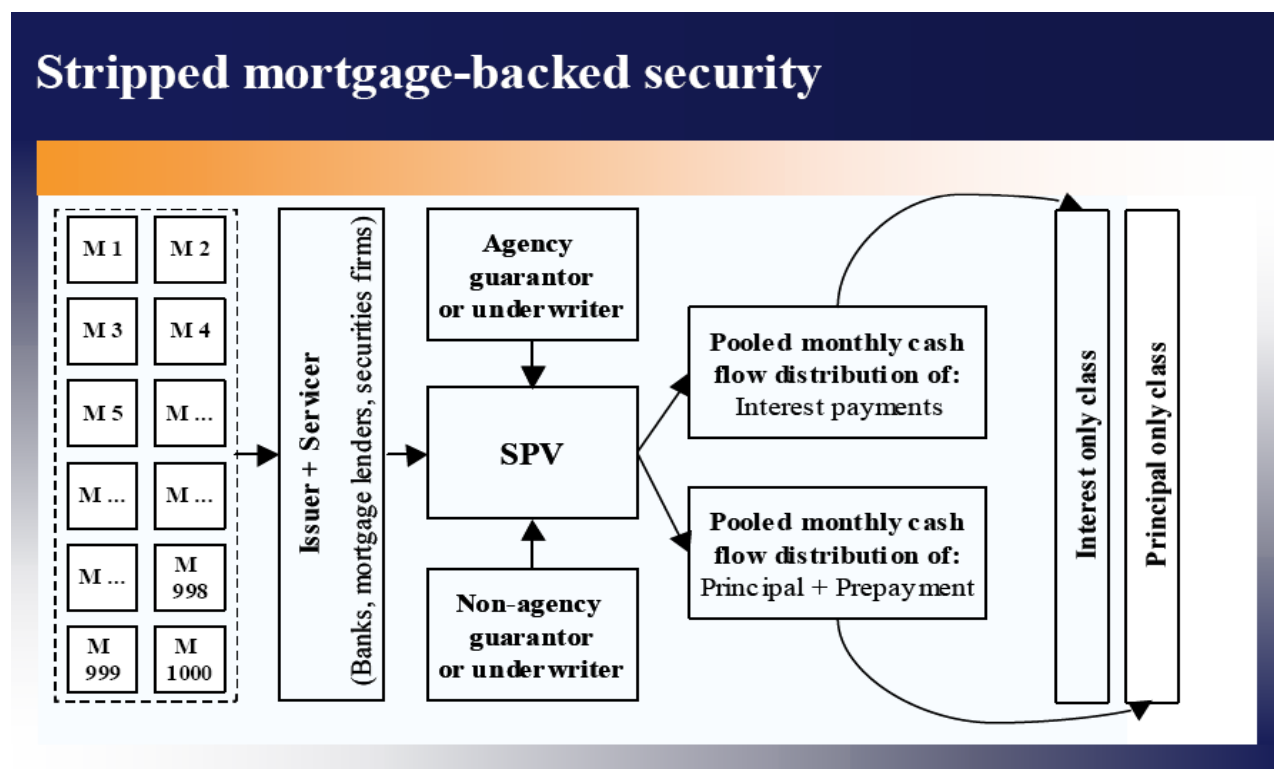


Figure 19: Stripped mortgage-backed security<sup>88</sup>

### 3.3 Collateralized debt obligations

The CDO technology which also permits active trading of the collateral is now being used for the securitization of residential and commercial mortgage-backed securities and other real estate collateral. This offers MBS issuers, investors, investment banks, fund managers and others in the real estate industry new opportunities to utilize and participate in a developing primary and secondary market for MBS debt and to take advantage of arbitrage possibilities due to relatively wide spreads that are often available on such assets.<sup>89</sup> Unlike mortgage-backed securities, CDOs have an expanding list of asset types that may be included in the portfolio and are not exclusively backed by mortgages. Currently, the possible multiplicity of assets that may back a CDO, makes it difficult to estimate the

<sup>87</sup> Smisch (2007), p. 30

<sup>88</sup> own illustration with reference to Kendra / Costello (2007), p. 7

<sup>89</sup> Stern / Klingenberg (2000), pp. 1-3

impact of subprime mortgages on the CDO market and to which extend they are exposed to subprime. Moreover mortgages do not end up directly in CDO collateral, typically they have already been securitized as mortgage-backed securities before.

A CDO can be compared to a regular mutual fund that buys bonds, but the difference to a mutual fund is, that the securities that the CDO sells are them-selves bonds.<sup>90</sup> A CDO raises money mainly by issuing its own bonds and then uses the funds to purchase a portfolio. That may contain a combination of bonds, loans, securitized receivables, asset-backed securities, tranches of other collateralized debt obligations or credit derivatives like Credit Default Swaps that are referencing any of the former instruments.<sup>91</sup> The securities issued by the CDO are called tranches, offering the investor diverse maturities and credit risk characteristics. When the underlying pool of debt obligations consists of bond instruments, the CDO is called collateralized bond obligation (CBO). When the underlying pool of debt obligations consists of loans the CDO is referred to as collateralized loan obligation (CLO).<sup>92</sup> A CDO can also be backed by a portfolio that includes a combination of loans and bonds.

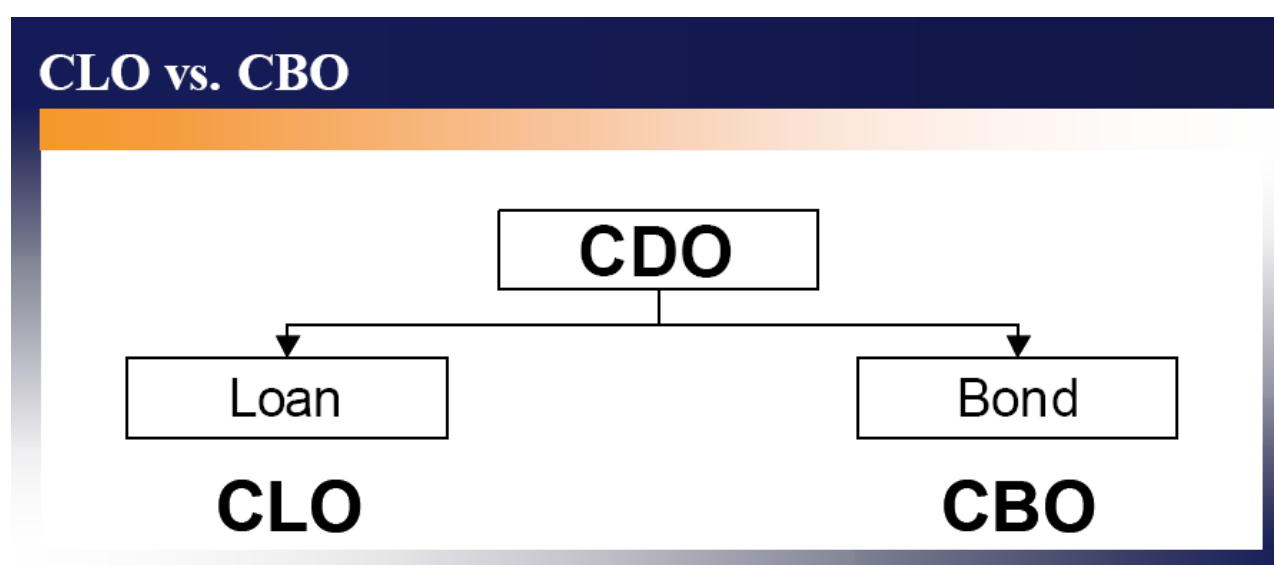


Figure 20: CLO vs. CBO<sup>93</sup>

In the last ten years CDOs have experienced a rapid growth rate as can be seen in figure 21 and figure 22. According to Mr. Robin Conner, vice president and assistant general counsel at the Bond Market Association, this high growth rate is due to the increased liquidity in the market and innovative structures.<sup>94</sup> The reasons for the enormous growth of the CDO market and how credit derivatives contributed to this development will be discussed in more detail later on in this paper.

The following figure 21 shows you how much the market volume of CDOs increased in only 10 years. In the mid of 2006 there was a volume of USD 291.6 billion outstanding with a market share of 14.68 percent in the asset-backed securities market, while back in 1995 CDOs only had a market share of 0.4 percent with an outstanding volume of USD 1.2 billion.

<sup>90</sup> Kothari (2007)

<sup>91</sup> Tavakoli (2003b), pp. 1-6

<sup>92</sup> Goodman / Fabozzi (2002), p. 1

<sup>93</sup> own illustration

<sup>94</sup> The Bond Market Association (2007b)

## CDO amount outstanding

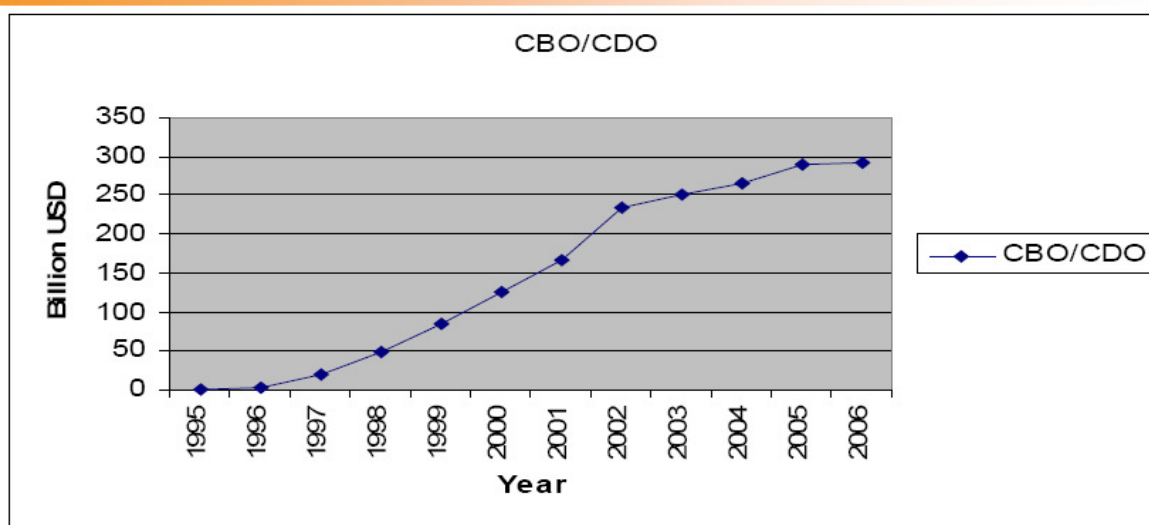


Figure 21: CDO amount outstanding<sup>95</sup>

Figure 22 shows the development of the asset-backed securities market in the last ten years. You can observe that CDOs do not have the highest market share in absolute terms but it stands out that they have the highest relative growth rate.

## Asset-backed securities outstanding

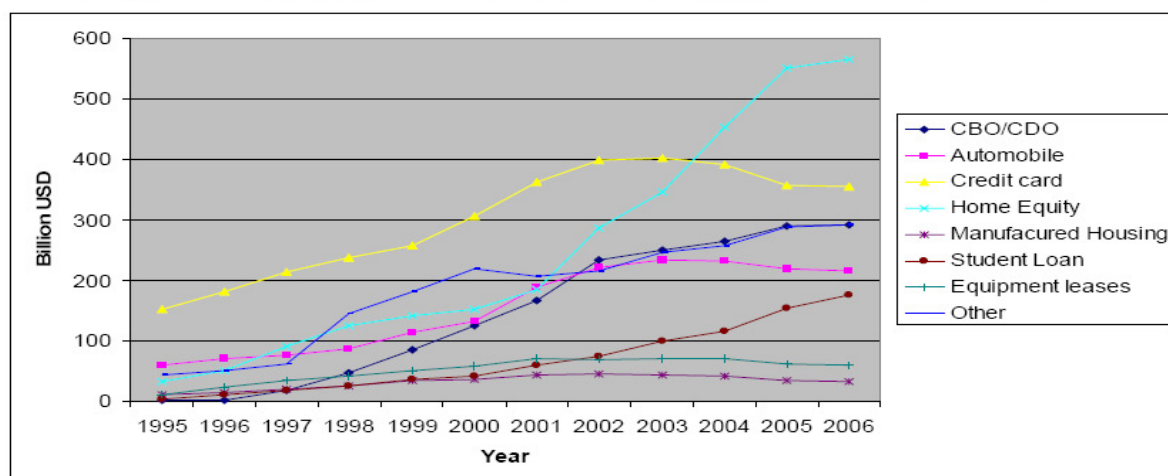


Figure 22: Asset-backed securities outstanding by major types of credit<sup>96</sup>

<sup>95</sup> The Bond Market Association (2007c)



### 3.3.1 Classification of CDOs

Figure 23 shows how CDOs can be classified. The first general differentiation has to be made between Cash CDOs and Synthetic CDOs. A Cash CDO ex-poses investors to risk by buying cash market debt instruments that are subject to default, while Synthetic CDOs expose their investors to risk by entering into several Credit Default Swaps.<sup>97</sup>

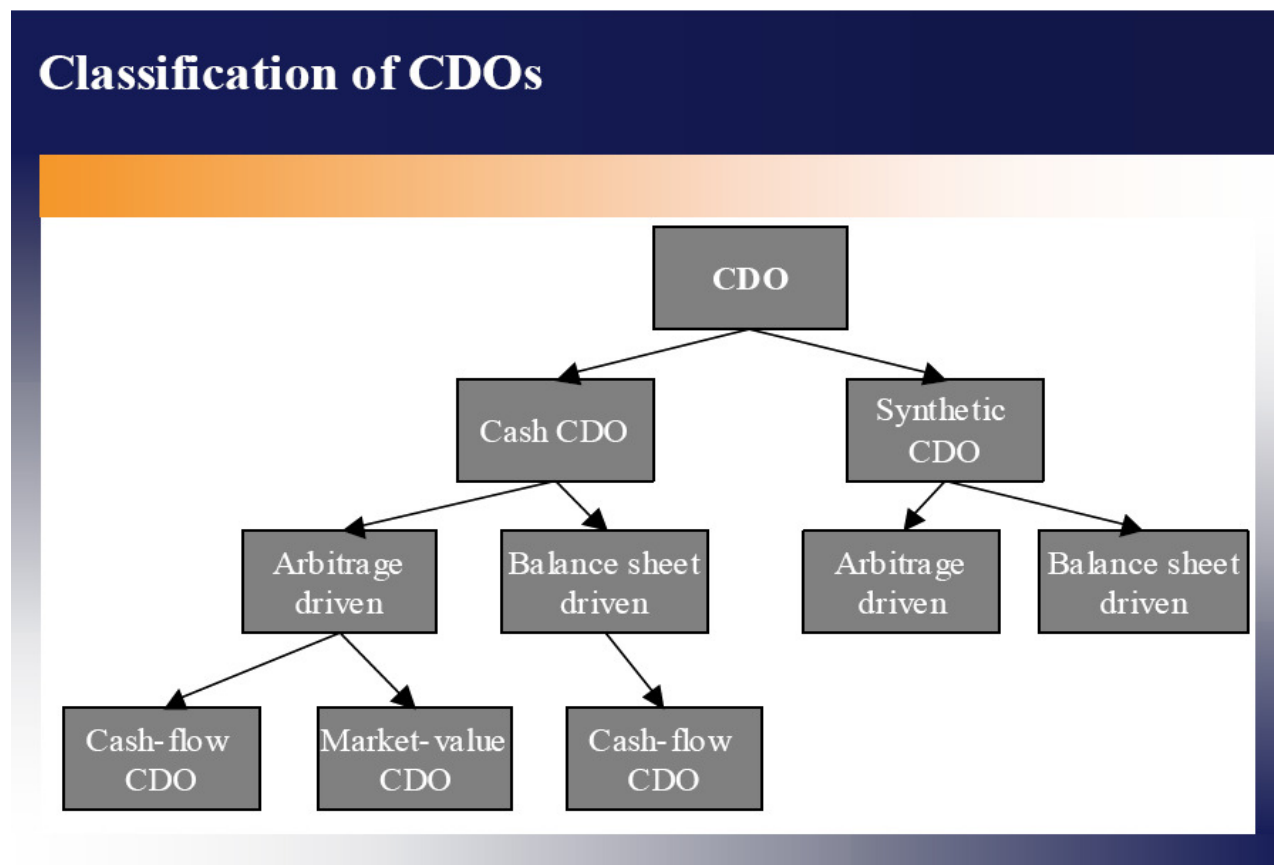


Figure 23: Classification of CDOs<sup>98</sup>

In the next two paragraphs a closer look will be taken on Cash CDOs and Synthetic CDOs.

#### 3.3.1.1 Structure of a Cash CDO

Cash CDOs are backed by cash market debt instruments. They are designed to pay off liabilities with the interest and principal payments of their underlying collateral.<sup>99</sup> A CDO has a sponsoring organization, typically investment managers, banks or other financial institutions, that form a Special Purpose Vehicle (SPV). The SPV issues debt obligations (tranches) to fund the purchase of the collateral, which is the underlying portfolio of bonds and loans.

<sup>96</sup> The Bond Market Association (2007d)

<sup>97</sup> Kothari (2007)

<sup>98</sup> Goodman et al. (2005), p. 670

<sup>99</sup> Goodman / Fabozzi (2002), pp. 1-3

The tranches are categorized into Senior Class, Mezzanine Class and Equity class. The Senior Class and the Mezzanine class are rated AAA/AA and A through B respectively. The equity tranche is not rated.<sup>100</sup> The interest payments and the principal payments at maturity that have to be made for the tranches depend on the performance of the underlying collateral. The funds for these payments come from coupon payments, from assets that are maturing and from the sale of assets. The investors who bought the tranches bear the credit risk, so in a case of a credit event they are not fully repaid. The risk of loss on the reference portfolio is divided into tranches of increasing seniority. Losses will first concern the equity tranche, then the mezzanine tranche and at last the senior tranche. This means, that all immediate obligations to a given tranche are met before any payments are made to less senior tranches.<sup>101</sup> The originator of the CDO usually keeps the equity tranche and sells the other tranches in the market. This technique allowed CDO managers to form triple-A papers from a subprime collateral, as losses are absorbed by subordinated tranches. This provides a cushion for inventors that hold higher rated, investment-grade tranches of the CDO.<sup>102</sup>

CDOs often use swaps, caps and floors. The payments for the tranches are usually fixed whereas the interests from the assets in the collateral are often floating. Swaps are the perfect tool to correct this imbalance, floating cash flows can be switched to fixed cash flows and vice versa. Caps protect CDOs that pay floating from unexpected and unwanted raises in interest rates. If interests rise above a certain level the CDO receives cash from the counterpart of the Cap. Floors protect CDOs that receive floating from unexpected and unwanted falling interest rates. If interests fall below a certain level, the CDO receives a payment under the terms of the floor. The following figure 24 shows the typical structure of a Cash CDO.

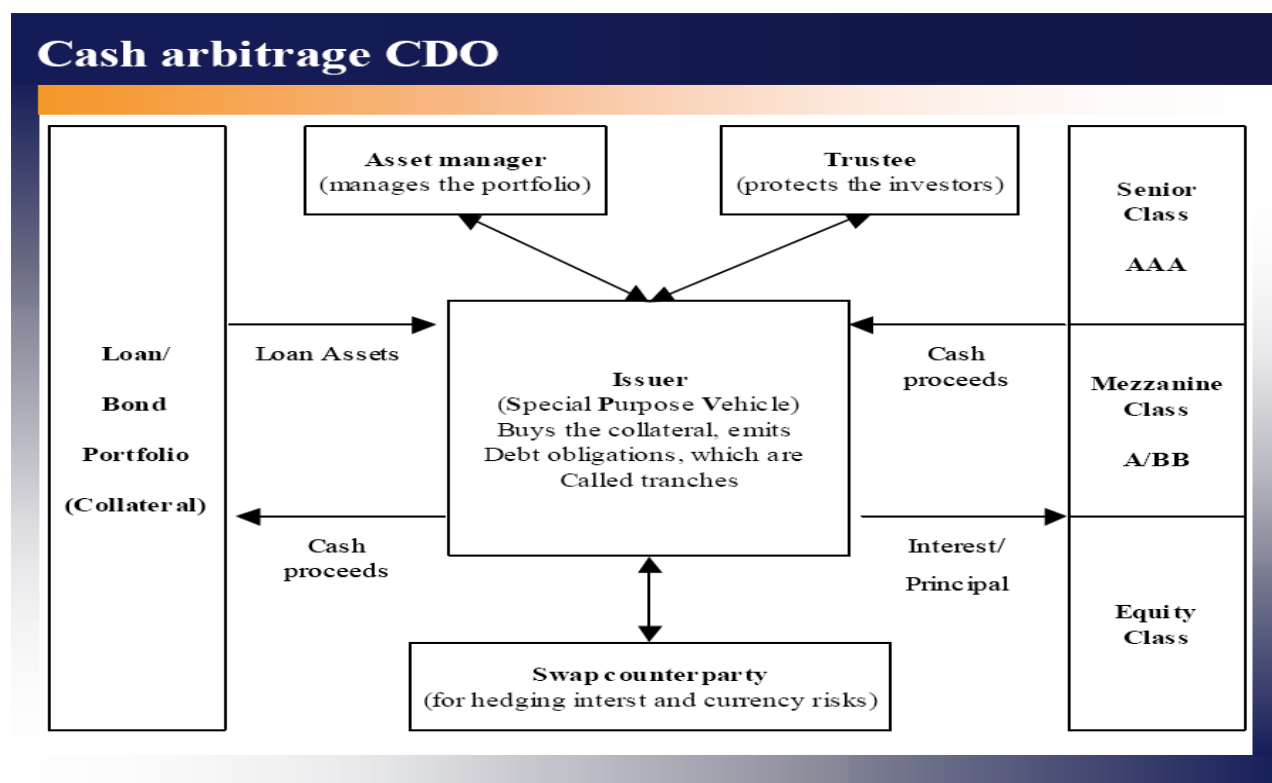


Figure 24: Cash Arbitrage CDO<sup>103</sup>

<sup>100</sup> Goodman et al. (2005), p. 671

<sup>101</sup> Riskglossary (2004)

<sup>102</sup> Hudson / Saha-Bubna (2007)

<sup>103</sup> Tavakoli (2003a), p. 24

The Asset Manager is responsible for managing the portfolio. A CDO has three phases in its life cycle. In the first phase, which is called ramp-up-phase, the manager issues the tranches and uses the funds to buy the assets that are in the collateral. In this phase he has to take some rules into consideration that might for example require that the initial assets have a minimum average rating, a minimum average yield and a minimum degree of diversification.<sup>104</sup> In the following period, the revolving phase (five or more years) the manager actively manages the portfolio by reinvesting the cash flows from the portfolio as well as purchasing and selling assets.<sup>105</sup> In the last phase, the amortization phase, the manager stops reinvesting and focuses on repaying the CDO tranches as the maturity date of the tranches is close. One of his most important tasks is to ensure that several tests like coverage and quality tests are met, that are inflicted by rating agencies. For example there is one test, which compares the balance of the collateral to the balance of the CDO's debt securities ("Overcollateralization"). Another test, which is called "Interest coverage test", measures if the interest that the CDO must pay for its tranches is backed by the interest cash flow from the collateral<sup>106</sup>. If these ratios fall below a certain level, the amortization phase would start earlier. These tests and rules were introduced to protect investors.

Furthermore the interests of investors are protected by trustees. Not many trustees can be found in the market; only some big issuers of CDOs offer this service. They work as collateral administrators and provide the investors with necessary and helpful information. However, in a managed CDO, investors do not only face the credit risk, but also the risk, that the CDO is poorly managed.

Besides, there are also static CDOs where the underlying collateral is fixed throughout the life of the CDO. In this case it is very important to make the right decisions in the first phase.

The motivation for a CDO is either arbitrage-driven or balance sheet-driven. In balance sheet transactions the aim is to remove debt instruments, in particular loans, and the risk of these positions from the balance sheet. A CDO is a popular tool, frequently used by banks and other financial institutions, to minimize regulatory capital requirements.<sup>107</sup> It enables originators of loans to issue even more loans and to enter into new businesses. The motivation for Arbitrage transactions is firstly to earn the hopefully positive spread between the returns that the CDO makes from the collateral and the payments that are made for the debt obligations (tranches). Secondly, a fee is charged for managing the CDO.

Furthermore it is important to distinguish between cash-flow and market-value CDO deals. Cash-flow deals are principally managed to pay off liabilities from the interest and principal payments of the collateral. Market-value CDOs try to increase the return on equity for investors by more regular trading and advantageous sale of the collateral. The goal is to maximize the value of the portfolio based on anticipated trends in the market.

### 3.3.1.2 Structure of a synthetic CDO

Synthetic CDOs developed as an outgrowth of Cash CDOs. As it was described earlier in this paper, cash CDOs have a reference portfolio that contains cash assets that are subject to default. Synthetic CDOs issue regular classes of bonds like Cash CDOs do either. These securities are called credit linked notes. The funds that are generated from the sale of credit linked notes are reinvested

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<sup>104</sup> Goodman et al. (2005), p. 672

<sup>105</sup> Riskglossary (2004)

<sup>106</sup> Overbeck (2007), p. 18

<sup>107</sup> Overbeck (2007), p. 40

into low-risk AAA-rated securities.<sup>108</sup> The risk exposure for the investors is created by entering into Credit Default Swaps, in which the CDO is the seller of credit protection. Synthetic CDOs normally have two sources of funds, on the one hand the interests from the low-risk securities and on the other hand the fees earned from selling protection in terms of the CDS. These fees and interests are used to pay interests to their own securities.<sup>109</sup> The use of credit derivatives was the key element that led to the extreme growth rate in the CDO market.<sup>110</sup>

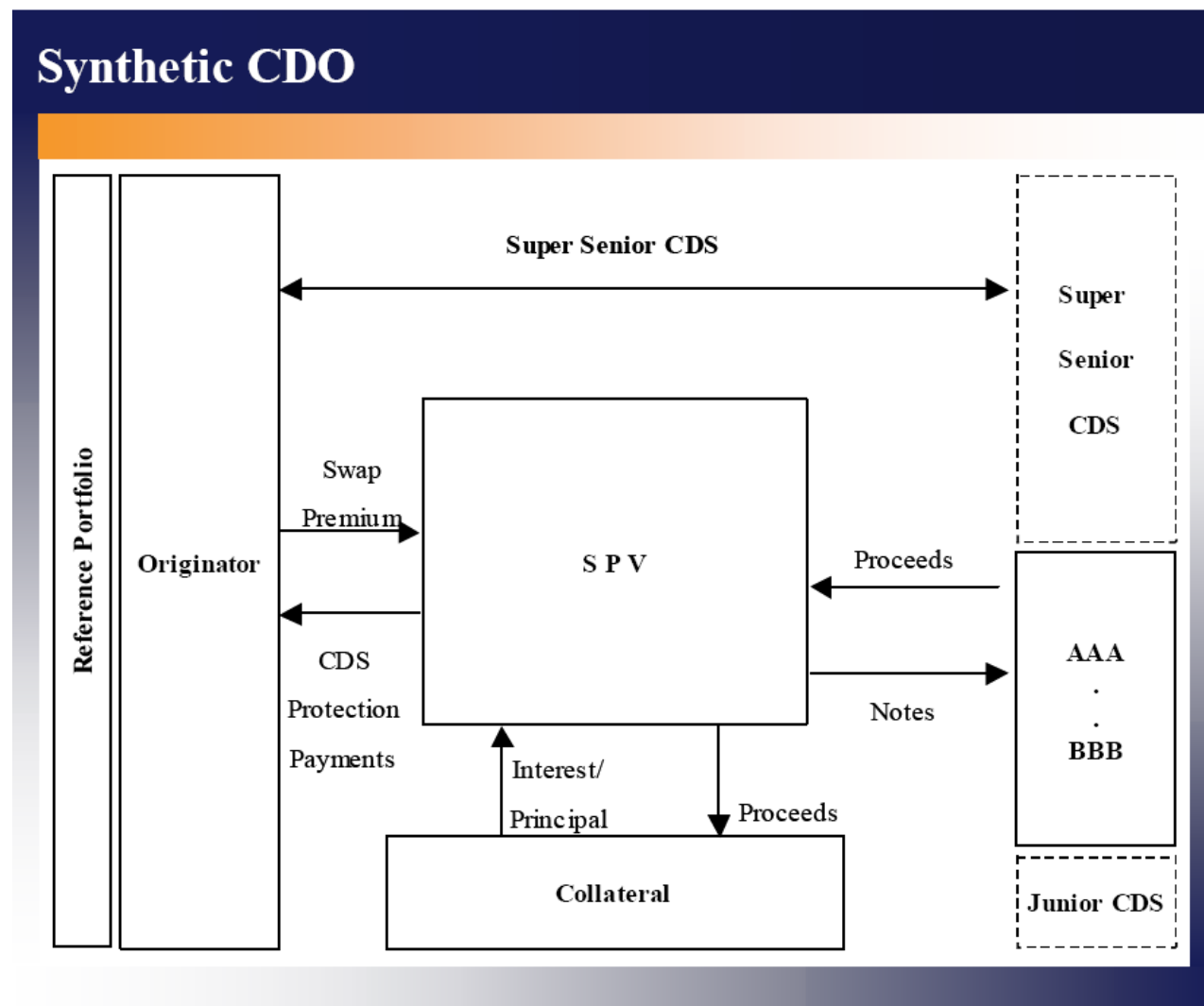


Figure 25: Synthetic CDO<sup>111</sup>

Synthetic CDOs can be static or managed and they can be either Arbitrage-driven or balance sheet-driven like cash CDOs. The motivation for synthetic deals comes from regulatory or practical considerations. For example, consider a bank that wants to keep the ownership of debt on the one hand, but on the other hand still wants to achieve capital relief in order to free capital. The sponsoring bank has a portfolio of obligations, which is called reference portfolio; the credit risk of this portfolio

<sup>108</sup> Adelson / Whetten (2004), p. 5-6

<sup>109</sup> Kothari (2007)

<sup>110</sup> Tavakoli (2003c)

<sup>111</sup> Overbeck (2007), p. 26

is transferred by entering into a CDS with the CDO.<sup>112</sup> The reference assets for the Credit Default Swaps stay in the books of the originator; they are not transferred to the SPV.

An interesting question is how a credit event affects the investors that buy securities issued by the synthetic CDO? If a credit event occurs with the originating bank, the CDO as a protection seller in terms of the CDS is required to pay the protection buyer. To pay this amount, the CDO has to use some of the low-risk securities of the portfolio. Consequently the value of the portfolio would decrease and there might not rest sufficient funds to repay the outstanding credit linked notes. This example illustrates, that for investors in the synthetic CDO market, a credit event has basically the same effect as a default of a bond for investors in the cash CDO market.<sup>113</sup> As long as the default event does not take place, investors get returns equal to returns from the AAA-rated investments and the default swap premium.

Some synthetic CDOs issue unfunded classes and regular tranches. A tranche that is unfunded can be compared to a CDS that references the whole underlying portfolio. In figure 25 the Super Senior class is unfunded. The investor who buys the unfunded class must not pay a purchase price. He acts like an insurance company that sells an insurance policy to the originator and as being the protection seller, he receives regular payments. In case that the underlying portfolio experiences losses exceeding a certain level, the protection seller (holder of the Super Senior class) has to pay the originator of the CDO the amount of losses that is above this level.<sup>114</sup> The probability of this case is very low, because normally this tranche has an AAA rating. The other classes in figure 25 are regular tranches. Holders buy these tranches and receive interest payments and the principal at maturity.

A major advantage of synthetic deals to cash deals is the unfunded nature of the credit default swaps, which allows much more flexibility in the creation of these deals. Consider the following example. If you want to achieve a credit exposure of USD 500 million of bonds, the Cash CDO must catch the attention of USD 500 million in investments to purchase the bonds. In a synthetic deal an exposure of the same amount can be backed by just USD 100 million in low-risk securities. In such a deal the reference portfolio is tranching, but only the lower rated tranches are funded. In this example, the highest and unfunded tranche that covers USD 400 million would be the Super Senior tranche, which is sold off as a CDS. The regular class is funded and might contain USD 75 Million of investment grade tranches and USD 25 million of mezzanine and non-rated tranches. This is a classic example of a synthetic CDO that has un-funded and regular classes as it was described earlier in this paper. It is much cheaper to sell the super senior tranche as CDS than funding the tranche. Moreover deals with unfunded and regular classes offer a higher capital relief under the Basel requirements.<sup>115</sup>

### 3.3.2 Benefits and Risks

CDOs became more and more important in the asset-backed environment. On the one hand they give banks the opportunity to sell credit risk and improve its own risk profile. On the other hand CDOs enable them to diversify their risk portfolio by selling their own credit risk and acquiring risk from other markets by buying tranches of CDOs in these markets.<sup>116</sup> They can be used for liquidity management, spread opportunities and regulatory capital management.

In 2007 the new Basel II regulations were launched and the capital requirement issue will become even more important for financial institutions. That is why it will be interesting to observe

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<sup>112</sup> Riskglossary (2004)

<sup>113</sup> Adelson / Whetten (2004), p. 5-

<sup>114</sup> Kothari (2007)

<sup>115</sup> Riskglossary (2004)

<sup>116</sup> Overbeck (2007), p. 40

how the CDO market develops in the future and if CDOs will be used even more frequently in the future. One can say that it is possible with a CDO to create high quality debt from average quality debt<sup>117</sup>.

From the investor's point of view CDOs are very attractive because they offered high returns in the past, reaching 30% to 40%. However investors should always be aware of the fact that CDOs bear a high level of risk. At an earlier stage in this paper, measures to protect investors like coverage tests, quality tests and trustees were mentioned. Nevertheless it should be considered, that managers can manipulate these tests, for example by leading or lagging cash flows. Additionally, in managed deals the investor does not always know what collateral will be invested in. Moreover it is very difficult to analyze the whole portfolio, very sophisticated risk models are necessary, especially because of the tranching method that is used in CDOs. Furthermore one major credit event or a rating downgrade of an asset in the collateral can lead to huge losses for investors who purchase tranches of a CDO.<sup>118</sup>

### 3.4 Key findings

- Securitization allows creating small and marketable securities from big and illiquid assets.
- Securitization enlarges the range of investors in the U.S. mortgage industry and thus drove its growth.
- Securitization allows forming a big variety of securities with different risk characteristics and maturities.
- Securitization allows mortgage originators to by-pass capital requirements and to increase their leverage, which enables mortgage lenders to stretch originations.
- Mortgage-backed securities trade at a spread to Treasury and corporate bonds of comparable quality because in addition to credit and interest rate risk they also expose investors to prepayment risk.
- The slicing of the collateral into different subordinated tranches with different risk characteristics allows CDOs to form triple-A papers from average quality debt.

## 4 The impact of the crisis

Considering the background information about the meltdown in the subprime mortgage industry and how risky subprime mortgages have been securitized in huge amounts over years, it is not coming as a big surprise to CDO market participants that the performance of recently issued CDO deals is very likely to track the performance of the subprime mortgage market. In fact, as subprime mortgage lenders pushed forward over the last years to place a record number of borrowers into mortgages, that these borrowers could not afford, and securitize them in the form of mortgage-backed securities, so did CDO managers rush to put these MBS securities in the portfolios of their CDO products.<sup>119</sup> The appetite of yield hungry investors did not stop them either to do so. Rating agencies played along by giving CDO tranches, that are exposed to subprime mortgage-backed securities, ratings that equal GE quality. CDOs were a very important factor for the enormous growth in the subprime lending industry as they bought the riskiest parts of subprime-backed bonds. The CDO bonds are very attractive

<sup>117</sup> Goodman et al. (2005), p. 672 49

<sup>118</sup> Riskglossary (2004)

<sup>119</sup> Asset Securitization Report (2006), p. 8

because they offer high returns and they have been skillfully marketed by promising minor risk characteristics.<sup>120</sup> But with home price appreciation slowing down in the second half of 2006 and borrowers experiencing payment shocks due to readjusting ARM rates the subprime crisis also paved its way to the CDO market, leaving participants with the question: What is the impact of the crisis on the CDO market?

The subprime impact on the U.S. CDO market will firstly depend on the degree to which CDOs are exposed to the currently poor performing U.S. subprime mortgage market. Secondly, the factors that contribute to the performance of CDOs have to be analyzed.<sup>121</sup> This includes many unpredictable factors like ratings and characteristics of mortgage-backed securities that back a CDO and the performance and competence of the CDO's asset manager. Furthermore general market conditions like interest rates, that affect adjustable-rate mortgages and the housing price environment, have to be examined. At this point in time the full impact of the exposure to subprime-related mortgage-backed securities can only be estimated, as more information regarding mortgage performance will only materialize in the last quarter of 2007.<sup>122</sup> Nevertheless, information about current market conditions and trends derived from historical data allow giving an outlook where the subprime crisis might take the CDO market. To start off, the typical portfolio allocation of these CDOs will be described and how the exposure to subprime mortgage-backed securities increased over the last couple of years.

#### 4.1 CDO exposure to the subprime market

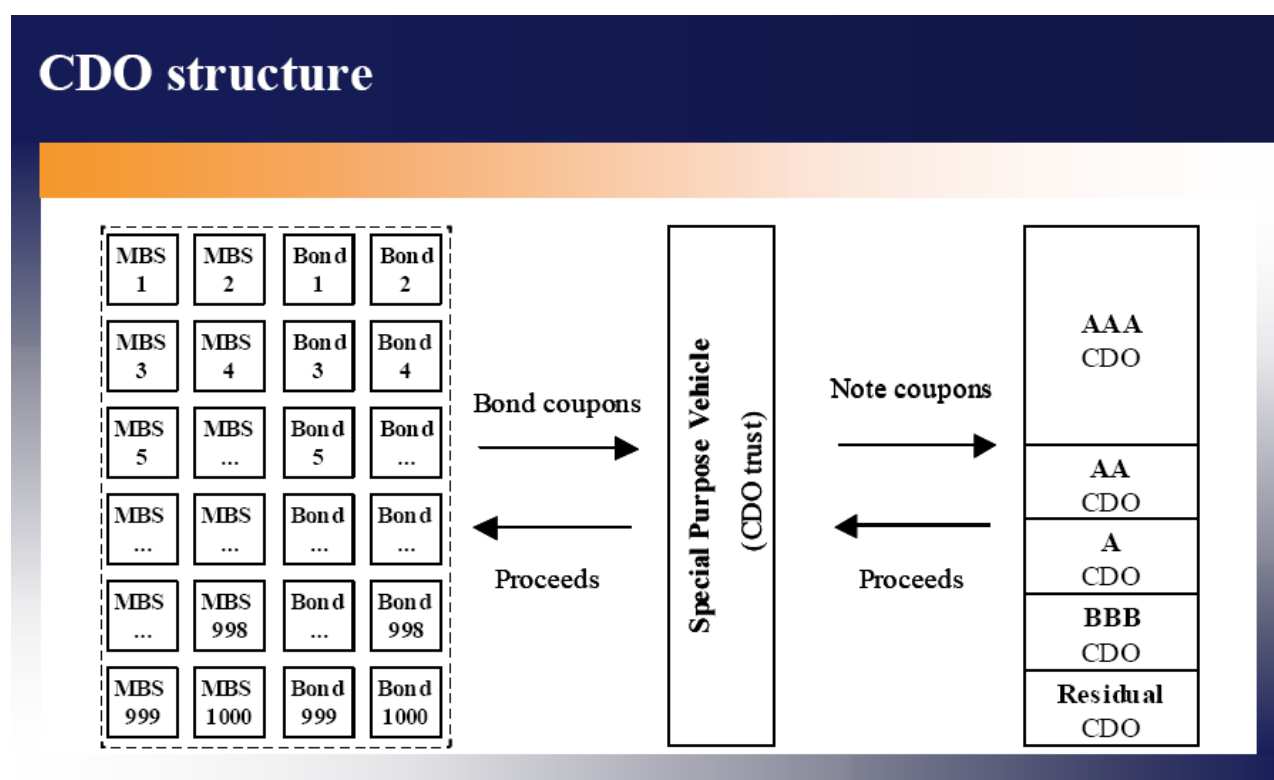


Figure 26: CDO structure<sup>123</sup>

<sup>120</sup> Hudson / Saha-Bubna (2007)

<sup>121</sup> Wyss (2007), p. 21

<sup>122</sup> Cromartie et al. (2007), p. 8

<sup>123</sup> Kendra / Costello (2007), p. 9

It is very challenging to determine the exact exposure of a CDO to subprime mortgage-related instruments because the portfolios that back CDOs usually carry a high degree of diversification. According to Moody's the representation of subprime mortgage bonds in the collateral of CDOs differs greatly from deal to deal, ranging from almost nothing to almost 90 percent.<sup>124</sup>

Take a look at figure 26 that illustrates the typical CDO structure. CDOs do not carry mortgage-backed securities exclusively, they rather contain hundreds of different types of bonds or loans with different risk characteristics, much in the way a mutual fund holds stocks. These assets are generally exposed to the risks of many different industries. The simple idea behind this is that problems in one industry are supposed to be compensated by upswings in other industries. In contrast to mutual funds, CDO managers dice and slice their portfolio in order to give investors the possibility to choose the amount of risk they want to take by buying those CDO tranches<sup>125</sup> CDO portfolios generally contain 50 to 150 types of bonds like residential mortgage-backed securities, commercial mortgage-backed securities, asset-backed securities and tranches of other CDOs.

Nevertheless recent vintages of CDOs in the U.S. do not show a high diversification of assets. Figure 27 reveals how CDOs accumulated a high portion of mortgage-related securities in their collaterals leveling off around 70% to 80% in the last three years, which is a huge number considering the variety of investment alternatives CDO managers have.

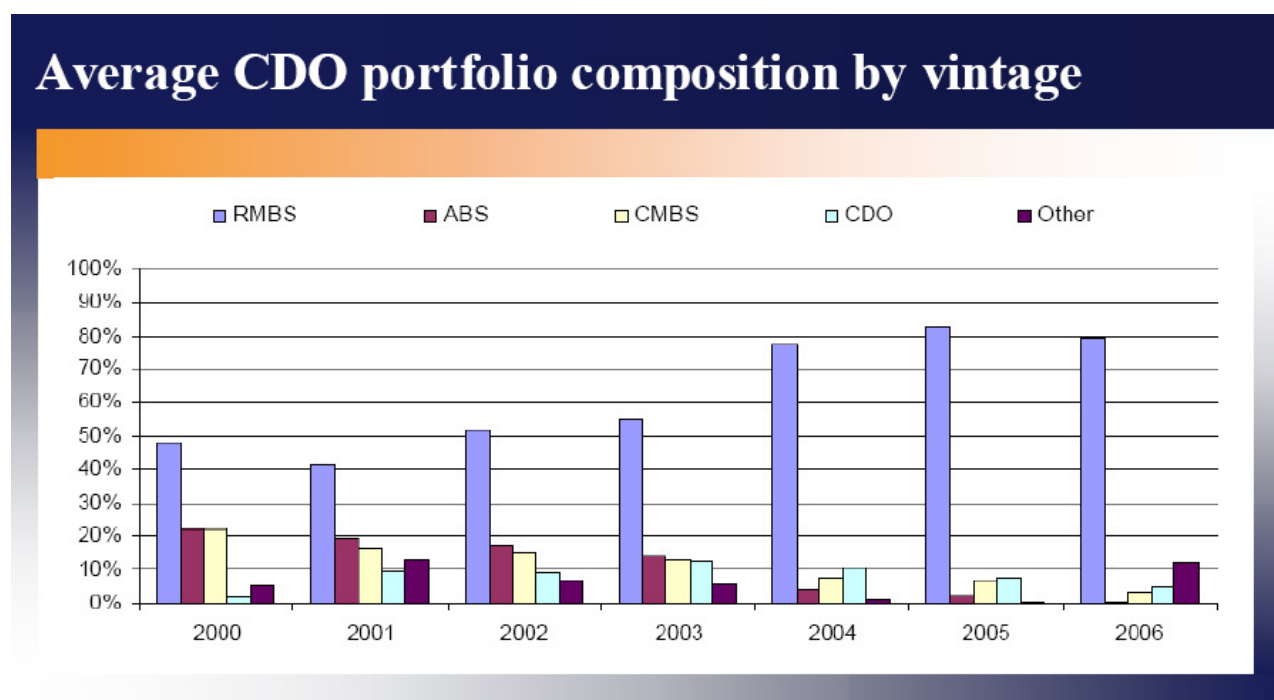


Figure 27: Average CDO portfolio composition by vintage<sup>126</sup>

CDOs have been critical in funding the U.S. mortgage industry by forming huge investment-grade pools from subprime-related bonds and the speculative-grade tranches fed the appetite of investors that were looking for higher risk and higher yield investments. The high concentration in

<sup>124</sup> Terris (2007), p. 17

<sup>125</sup> Hudson / Saha-Bubna (2007)

<sup>126</sup> Kendra / Costello (2007), p. 47



mortgage-related securities results from the fact that mortgage-backed securities have shown a very stable performance because interest rates were quite low and house price appreciation was strong<sup>127</sup>

In the U.S. CDOs are categorized into two main sub segments, high grade and mezzanine. High-grade CDOs are those that are backed primarily by high-rated tranches from mortgage-backed securities or other structured finance transactions with ratings from AAA to A. Mezzanine CDOs are mainly backed by tranches with A, BBB and BB rated tranches. Since 2002, these CDOs were increasingly collateralized by mortgage-backed securities, which of course carry subprime. In particular the mezzanine structured CDOs have become more and more exposed to subprime mortgage-backed securities, peaking at a percentage of more than 70 percent last year according to Fitch and Standard & Poor's.<sup>128</sup>

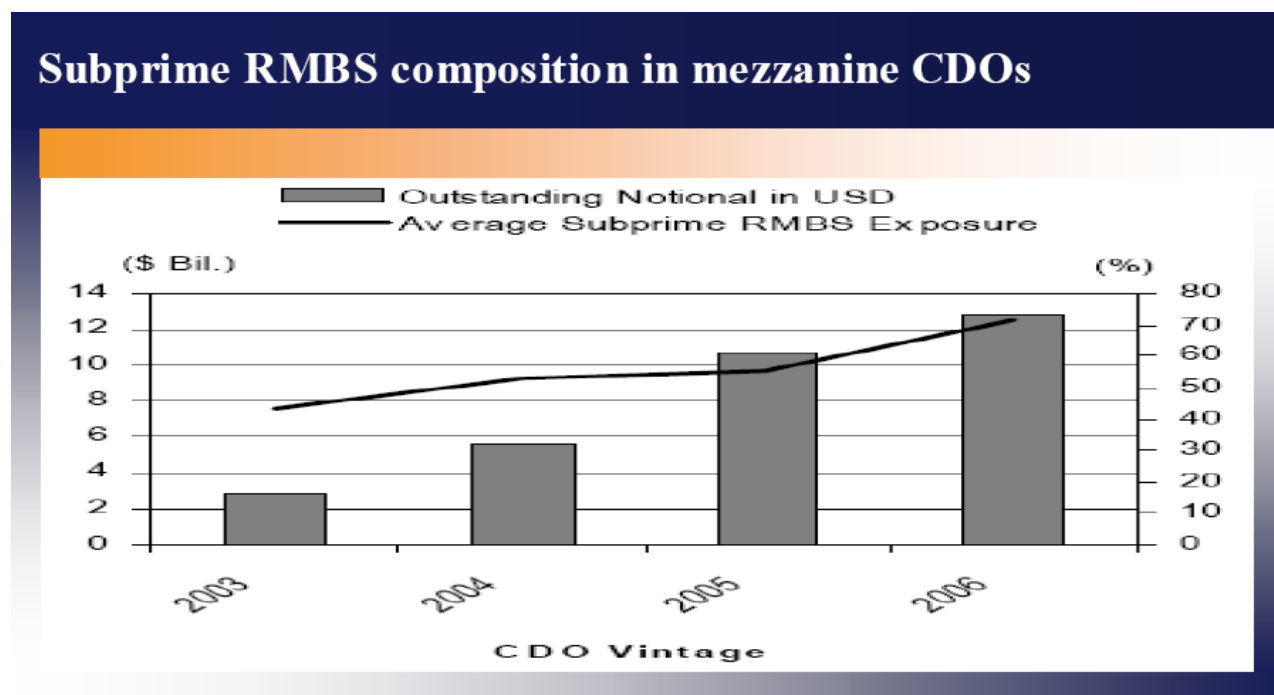


Figure 28: Subprime RMBS composition in mezzanine CDOs according to Fitch<sup>129</sup>

<sup>127</sup> Terris (2007), p. 17

<sup>128</sup> Wyss (2007), pp. 21-22

<sup>129</sup> Miller et al. (2007), p. 3

## Subprime RMBS composition in mezzanine CDOs

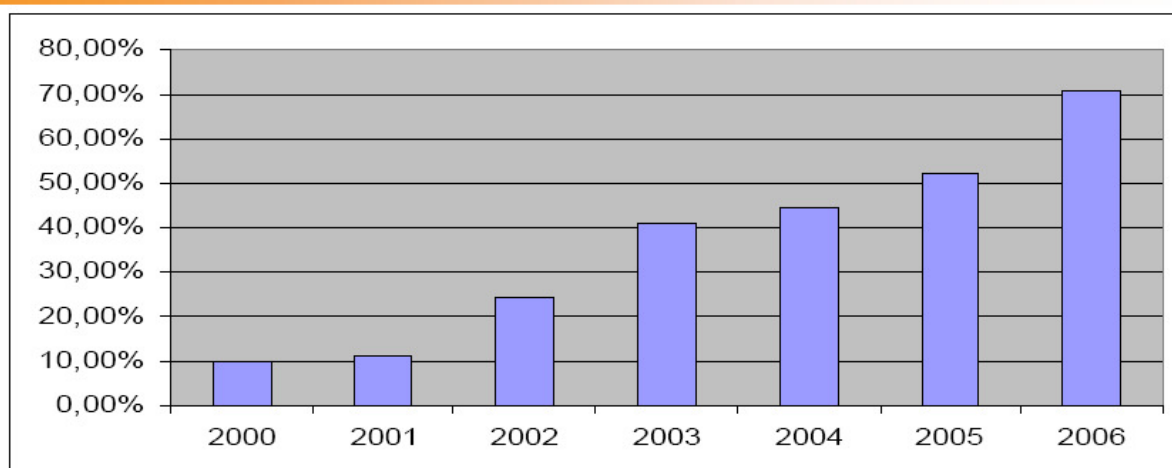


Figure 29: Subprime RMBS composition in mezzanine CDOs according to Standard & Poor's<sup>130</sup>

The preceding figures reveal that the U.S. CDO industry has accumulated a considerable exposure to the U.S. subprime mortgage industry, which explains the nervousness of originators and investors in the CDO market. The following part will examine the performance drivers of CDOs and the current overall market and economic conditions. It can be foreclosed that this outlook and analysis will not ease the pain of frightened market participants.

### 4.2 Factors that affect the performance of CDOs

Factors like home price appreciation and low interest rates that were moving in favor for investors that were / are exposed to subprime mortgages and drove the growth in the subprime and securitization industry are now turning around. The next paragraphs will shed light on these movements and some other factors that have influence on the performance of CDOs.

#### 4.2.1 HPA – House Price Appreciation

House price appreciation indices are the most important indicators for the performance of the US housing market. Besides the risky characteristics of sub-prime mortgages, the slowdown in house price appreciation was one of the main reasons for the subprime meltdown. Lower home values leave borrowers with less refinancing alternatives. Figure 3 already showed the HPA index of the “Office of Federal Housing Enterprise Oversight (OFHEO)” that indicates a major decline in the U.S. housing market. The following figure illustrates another prominent index that supports the results of the OFHEO index. The Standard & Poor's Case-Schiller is based on changes in home prices and measures increases and decreases in the value of real estate all over the U.S.<sup>131</sup>

<sup>130</sup> Wyss (2007), p. 21

<sup>131</sup> Standard & Poor's (2007)

## S&P/CS® Home Price Index, composite - 20

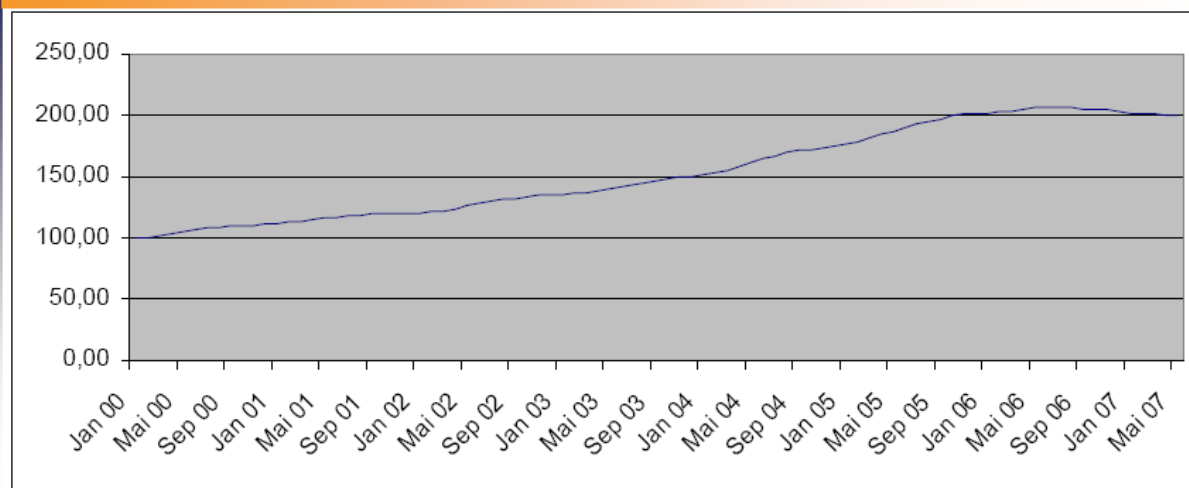


Figure 30: S&P/CS® Home Price Index, composite - 20<sup>132</sup>

Leading economists do not fully agree if the housing market will ultimately recover or experience a further depreciation in home prices. However the bad development of all the major indices, that record home price data, increases the probability of a further drop occurring. In the first chapter a study from the Center for Responsible Lending was quoted that indicates that more than 2.2 million mortgages will end in foreclosure or have already failed. This means that U.S. real estate markets, where demand for properties has been decreasing will be flooded with even more supply. This increased probability of a further drop in home values, the risky characteristics of MBS collaterals and tightened underwriting standards for mortgage loans put further pressure on mortgage-backed securities.<sup>133</sup>

House price appreciation is very important for MBS collateral because the probability of default on a mortgage is generally lower if the property by which it is secured, has a stable or increasing value. Moreover strong HPA accelerates prepayment speed. Earlier in this paper prepayment was considered to be a risk for mortgage-backed securities because it changed the timing of cash flows and the return profile. Nevertheless it lowers the chances of delinquencies and de-defaults. In a strong HPA environment prepayments are faster, thus the time that the collateral is outstanding decreases, which means that that the possibility of a negative trigger event like a rate reset, a job loss or a serious illness of the borrower is also decreased. Hence, prepayment speed is another factor that reduces collateral losses when HPA is strong and exacerbates losses when HPA is weak. According to Citibank, there are some cases in which collateral losses, resulting from doubling default rates, can be the same as the increase in losses that stem from a halving of voluntary prepayment speeds.<sup>134</sup>

Figure 31 underlines the relevance that HPA has for the collateral of CDOs, especially for the lower-rated tranches as they concentrate the most credit risk. This puts the above-mentioned

<sup>132</sup> Standard & Poor's (2007)

<sup>133</sup> Wheeler et al. (2007), pp. 8-9

<sup>134</sup> Wheeler et al. (2007), pp. 8-9

mezzanine CDO deals on alert because they are the most exposed instruments to subprime mortgage-backed securities and are primarily collateralized by A, BBB and BB tranches.

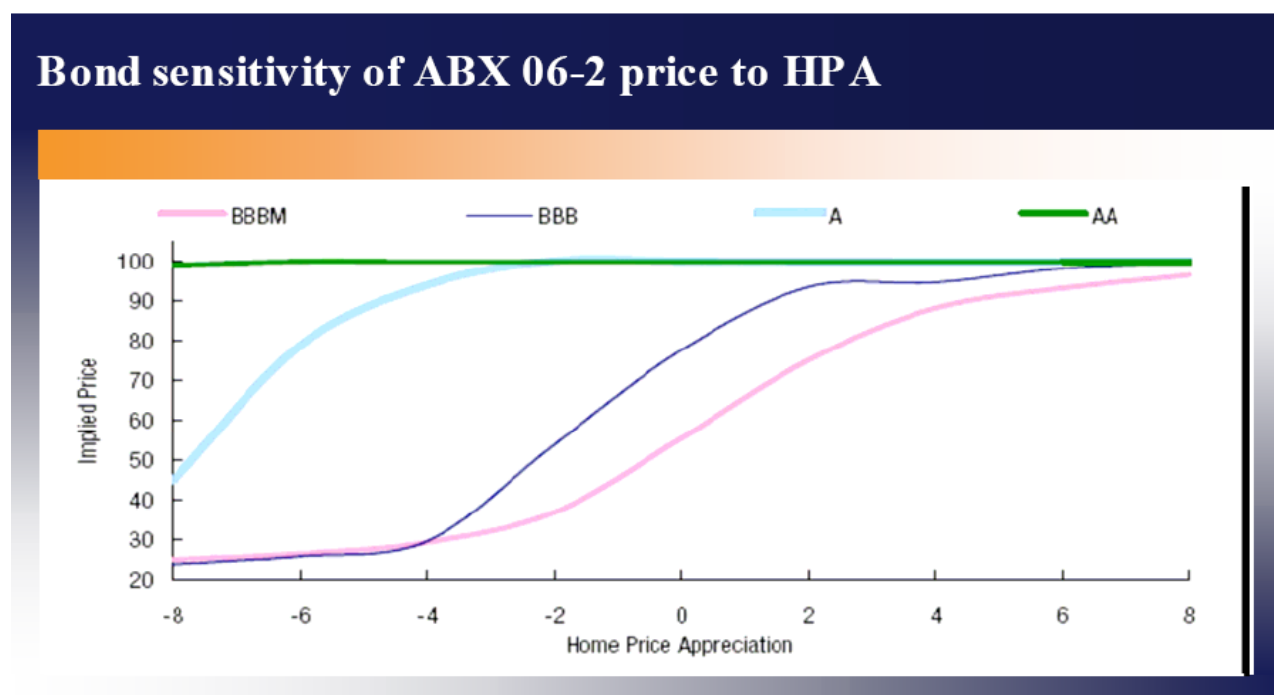


Figure 31: Bond sensitivity of ABX 06-2 price to HPA<sup>135</sup>

#### 4.2.2 ARM – Adjustable rate mortgages

At the moment the biggest concern for managers of mortgage-backed securities and collateralized debt obligations is how subprime borrowers will absorb the payment shocks that will result from the readjustment of interest rates in their ARM mortgages. Chapter one revealed that ARMs are the most common mortgage product in the subprime mortgage segment. Their low initial rates are reset after two, three or five years, depending on the contract terms of the loan. When analysing the following figure it can be understood that these concerns are legitimate because most resets of subprime mortgages that are currently outstanding are yet to come.

<sup>135</sup> Wheeler et al. (2007), p. 10

## First reset date as % of subprime outstandings

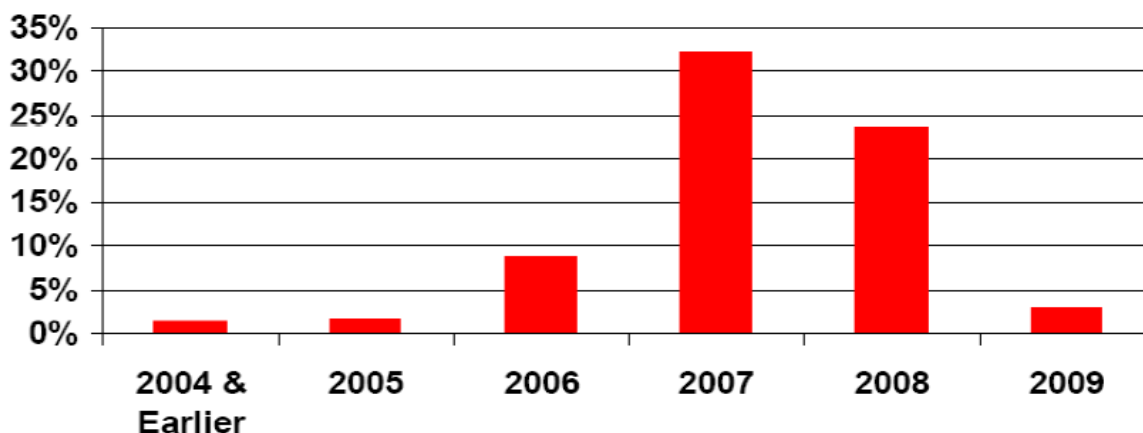


Figure 32: First reset date as % of subprime outstanding<sup>136</sup>

Historical data proves that the first reset date is a milestone in the timeline that tracks the performance of a loan. Higher interests generally result in increasing delinquencies and defaults. Mortgage borrowers find themselves in trouble after the first reset because the amount they have to pay to serve the loan increases. The period between the second and the fifth year of a mortgage is crucial for the performance because ARM rates are typically adjusted during this time interval. Fitch Ratings estimates that default rates after ARM resets are likely to increase by 150%.<sup>137</sup> Figure 33 highlights how default rates pick up in the second year and reach its peak after five years. Normally default rates slow down again afterwards because borrowers that “survived” the first payment shocks usually manage to maintain regular interest and principal payments until the loan matures.

<sup>136</sup> Kendra / Costello (2007), p. 44

<sup>137</sup> Costello (2007), p. 7

## Historical subprime default rates by loan age

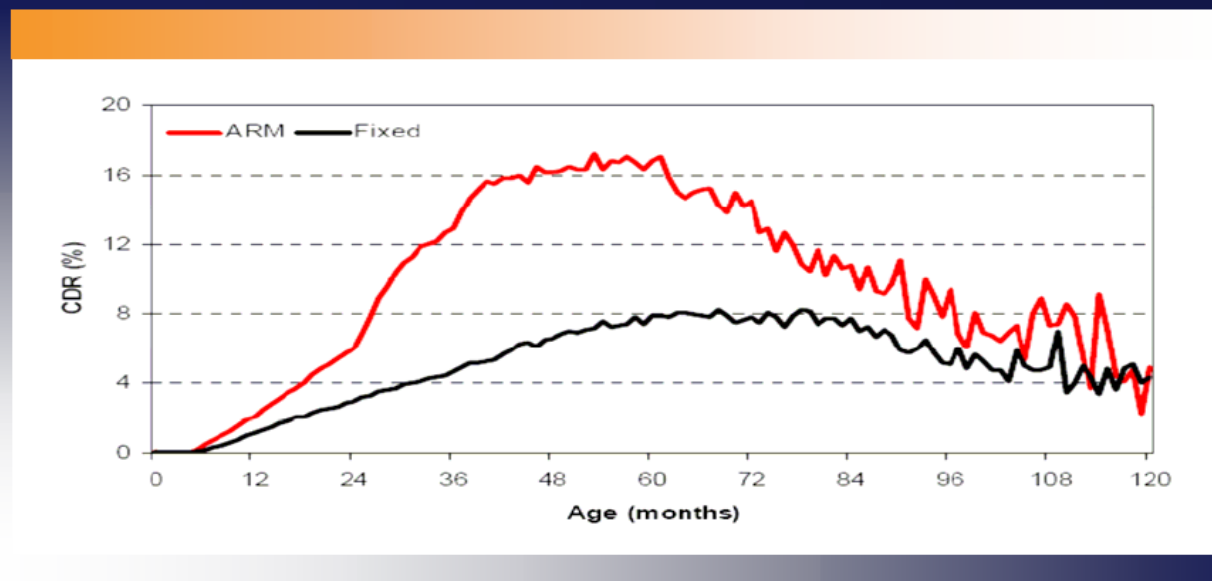


Figure 33: Historical subprime default rates by loan age<sup>138</sup>

Figure 34 shows anticipated average coupon payments and the anticipated development of the home price index. It can be observed that the spread between regular coupons and readjusted coupons swings between 200 and 250 basis points and that the rates slightly rise. This comes from the first signs of strengthened and tightened underwriting standards in the mortgage industry, as mortgage bankers now are running through a period of self-correction due to the recent experienced troubles. Another reason for the slowdown in the issuance of subprime mortgages is that the secondary market's demand for high concentrations of these very risky products also cooled down. It is hard to determine whether rates will increase more sharply than anticipated in this figure or not because there are still too many uncertainties lying over this industry like a black shadow. It is not clear how many banks will survive the first sub-prime wave and if new regulations will further slow down and hinder the placing of mortgages. For the short-term perspective, the probability is very high that mortgages will be less affordable due to higher prices and restricted underwriting volumes.

<sup>138</sup> Chaudhary et al. (2007), p. 18

## ARM resets vs. HPI

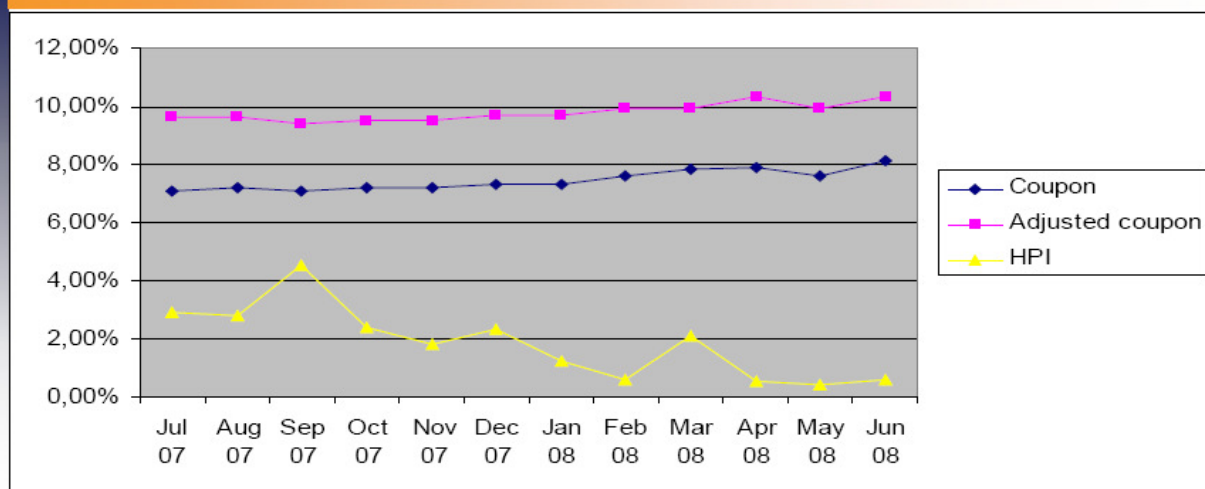


Figure 34: ARM resets vs. HPI<sup>139</sup>

Finally, it can be assumed, that it is more than likely that the ongoing pressure that comes from readjusting mortgage rates combined with a weak home price index will substantially harm the performance of collaterals that are exposed to subprime mortgages.

### 4.2.3 Asset management

In most CDO deals the asset manager's task is not only to select the assets in the beginning when the CDO is set up. They are also responsible for actively managing them throughout the whole life and for substituting them if necessary in order to trade out potential defaults. That is why the performance of the CDO also depends largely on the capability and the competence of the asset management.<sup>140</sup> In this particular case of a crisis the actions and measures of asset managers can save investors huge amounts of money. However, several analysts like Janet Tavolaki, president of Tavolaki Structured Finance, agree that many CDO managers were not doing their jobs well. They argue that CDO managers should have known the risky nature of packing CDO pools with securities that are exposed to subprime.<sup>141</sup> According to Jeffrey Grundlach, chief investment officer at the TWC group, a third of all CDO managers were first timers who had never set up a CDO pool before. Many of them were rushing to include the riskiest types of subprime mortgages in their pools to make the interest rates of their CDO tranches more appealing to investors. In many cases big Wall Street banks even denied to take over the management of CDOs because they were aware of their riskyness and the impact a downturn might have on their reputation. However, they still did not want to quit this risky but appealing business entirely. That is why they kept shares of those small and exotic securities firms that were managing the riskiest CDOs in the business.<sup>142</sup>

<sup>139</sup> Costello (2007), pp. 15-16

<sup>140</sup> Cromartie et al. (2007), p. 8

<sup>141</sup> Zuckerman (2007)

<sup>142</sup> Zuckerman (2007)

Nevertheless it would not be reasonable to blame CDO managers exclusively for the subprime mess. Even though there are and were some cases where they could have put some more efforts in due diligence and pre-analysis, they certainly knew about the risk. They were just servicing a market segment where investors were willing to take the high risks for the sake of higher returns.

At this stage in the paper, the discussion about CDO managers is not mentioned to identify market participants who are responsible for the problems in the CDO industry, it is rather mentioned to identify the only positive impact the subprime lending crisis might have on the CDO market. As illustrated in chapter 2 the demand for CDO products and its outstanding balance grew at an impressive speed over the last ten years. After such a successful period without major setbacks it was maybe about time for such a crisis to appear and calm down the industry. CDO managers became more and more courageous when they were setting up CDO portfolios as the principle with the seniority of losses in CDO tranches allowed them to form good quality papers, even from pools of assets with very high risk profiles. Subordinated tranches were kept by the CDO vehicle or in many cases were sold to other CDOs that resecuritized them. This vicious cycle of securitizing and resecuritizing might be interrupted now by the higher risk awareness of investors and CDO managers. Several factors like low interest rates and the incredible appetite (tolerance) for risky products in the secondary market, that accelerated this development, are now moving in favor of more traditional products and investors.<sup>143</sup> This process of self-correction is healthier for the industry than government interventions or increased federal regulation.

#### 4.2.4 Ratings

The subprime impact on the CDO market will also largely depend on the ultimate impact of risky subprime mortgages on the ratings of mortgage-backed securities. Consider for example a CDO that has many different kinds of MBS in its collateral. When rating agencies assign the ratings for a CDO, they examine the assets of the CDO portfolio and use their ratings to determine the default probability. Hence the ratings of the assets in the CDO collateral are the major input for the calculation of the final CDO rating.<sup>144</sup> Over the last years ratings of mortgage-backed securities were fairly stable, as the mortgage industry was performing very well. Now that the first subprime woes surface, rating agencies started to react as can be seen in figure 35. Rating downgrades started to accelerate in spring 2007. Many regulators and politicians believe that this reaction came too late, especially when you consider that banks gave the first warnings about possible subprime weaknesses in the second half of 2006 already. However, rating agencies argue that they cannot downgrade mortgage-backed securities on a speculative basis, they need evidence that mortgages or assets are underperforming.<sup>145</sup>

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<sup>143</sup> Wheeler et al. (2007), p. 16

<sup>144</sup> Costello (2007), p. 21

<sup>145</sup> Buck (2007)



## Fitch downgrade actions

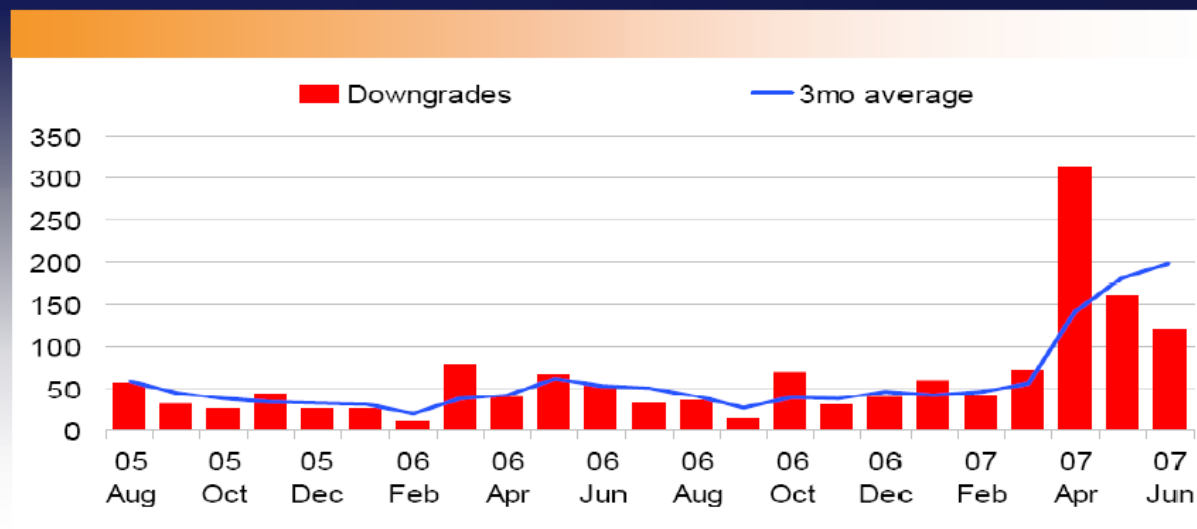


Figure 35: Fitch downgrade actions<sup>146</sup>

Nevertheless rating agencies are aware of the risky nature of the subprime business. The rate of downgrades of all three major rating agencies picked up substantially and it is even more striking that they have all revised and changed their rating methodologies for mortgage-backed-securities and collateralized debt obligations in response to the latest developments in the subprime industry.<sup>147</sup> Fitch for example issued a press release on July 12, 2007, which announced that it revised its methodology for rating structured finance CDOs to reflect the increased risk associated with subprime mortgage-backed securities as portfolio collateral. As a result, its changed methodology modeling assumptions will include default probabilities for U.S. subprime bonds issued since 2005 that increased by 25%. Hence the pressure from regulators (in Europe the European commission started investigations) and politicians combined with rating agencies modifying their internal rating guidelines increases the probability that more downgrades are about to come.

<sup>146</sup> Costello (2007), p. 3

<sup>147</sup> Buck (2007)

## Cumulative number of downgrades from January-July 2007

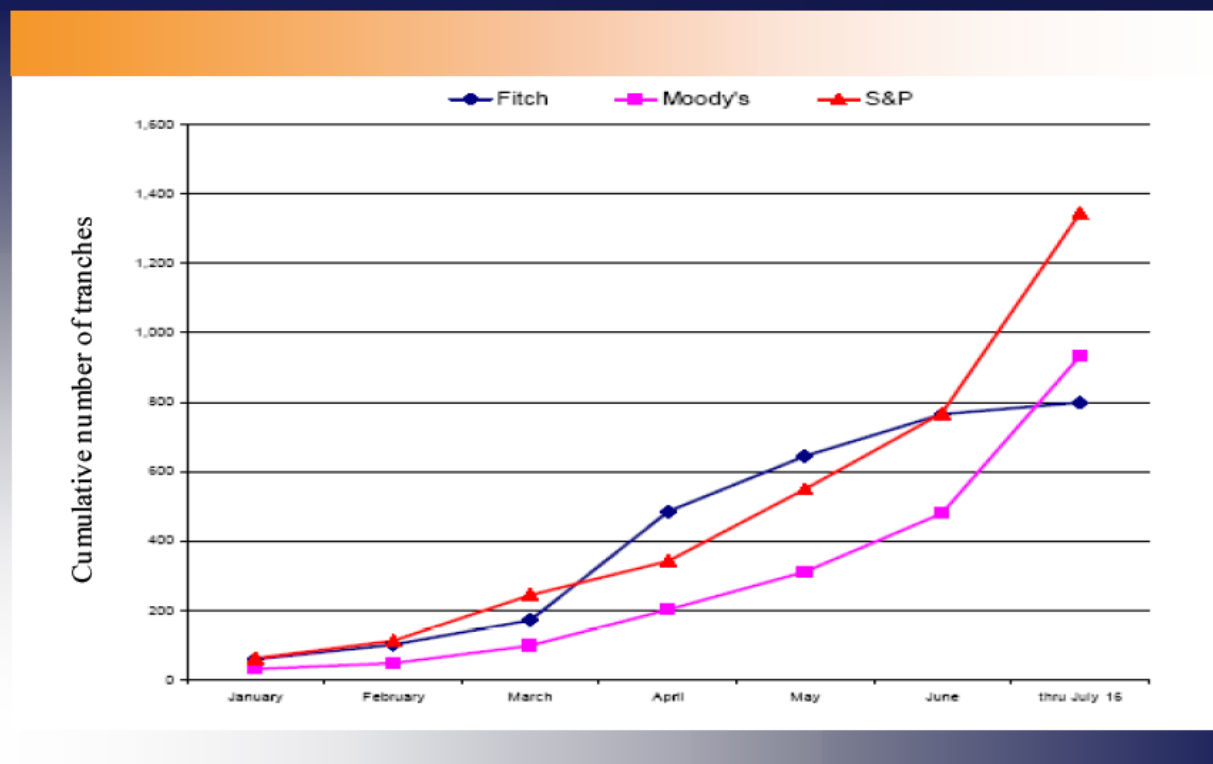


Figure 36: Cumulative number of downgrades from January-July 2007<sup>148</sup>

Moody's Investors Service announced that they would downgrade hundreds of subprime mortgage-backed securities and that it may downgrade ratings on slices of 91 CDOs, or about USD 5 billion of securities.<sup>149</sup> Standard & Poor's also published a list of collateralized debt obligations that hold mortgage-backed securities on which it will cut ratings soon.<sup>150</sup> The impact of these cuts in ratings on CDOs could be severe. Many of the outstanding CDO tranches are held by corporations or institutions (insurance companies, pension funds) that typically have restrictions on credit ratings. Thus they would be forced to sell these CDO bonds at a loss and it would become more difficult for CDO originators to market CDOs, as some of their most important clients would not be allowed to buy their products anymore. Moreover acceleration in rating downgrades may also drive high-yield investors that were buying the lower-rated tranches of CDOs to more prudence and cautiousness. These tranches absorb the initial losses from defaults, rating downgrades or delinquencies. Consequently CDO managers will face problems to create CDOs in the future if they do not find buyers for these tranches anymore.<sup>151</sup>

### 4.2.5 Regulation

At the moment the CDO market is not exposed to any direct new regulation attempts that result from the subprime turmoil. Regulators, politicians and central bankers have pointed the main focus on

<sup>148</sup> Costello (2007), p. 25

<sup>149</sup> Hudson / Saha-Bubna (2007)

<sup>150</sup> Jordan / Anderberg (2007), pp. 2-9

<sup>151</sup> Hudson / Saha-Bubna (2007)

the subprime lending market and the underwriting standards of mortgage lenders. They call for tighter and stricter federal supervision in the lending process. The aim is to avoid that borrowers with extraordinary high credit risks are able to qualify for loans they cannot afford and that they are caught by predatory lenders. Even though this intention was legitimate, it was the wrong signal to credit markets as it increased fears of hindered access to credits and a resulting credit and liquidity crunch. These fears showed signs of easing in the mid of August, when European and U.S. central bankers decided to provide funds for the financial system and lowered discount rates respectively.<sup>152</sup> This underlines that regulators and politicians should be careful with their regulation attempts at this early stage of the subprime crisis as credit markets and other financial markets are currently extremely nervous. However it will be interesting to see, how problems like predatory lending will be addressed in the future. The most reasonable suggestion might be to leave the mortgage industry in self-correction. They are already showing signs of self-regulation as the issuance of risky mortgages decreased and mortgage rates increased by one percent on average already. The most favourable factor for the self-correction is that many mortgage lenders closed down and consequently competition in this sector is reduced. The high concentration of competition was driving many mortgage lenders to sell mortgage loans to any kinds of customers. The impact of this development in the mortgage market will not be severe for the CDO market, as there will still be enough supply of mortgages and mortgage-backed securities that can be securitized. The risk profile of these mortgages will presumably be lower which decreases default probabilities but in the same time also decreases yields.

From the perspective of originators of mortgages and mortgage-backed securities a stricter regulation on the asset selection in the CDO market could be bitter, as CDOs are extremely important vehicles that buy tranches of mortgage-backed securities and release new funds for them. However it is yet to observe how significant the fallout in the CDO market will finally be and how regulators react.

### 4.3 Key findings

- The CDO market shows a significant exposure to subprime mortgage-backed securities, especially mezzanine CDOs, because they are primarily collateralized by the more risky A, BBB and BB tranches of MBS.
- Most indices that measure house price appreciation will very likely stay at low levels.
- The coupon interest levels in many mortgages are yet to reset in 2007, 2008 and 2009, which results in several payment shocks for mortgage borrowers.
- The number of rating downgrades in mortgage-backed securities picked up in spring 2007 and will harm the ratings of CDOs.
- Concerns that prepayments weaken the performance of mortgage-backed securities are marginal as they are traditionally low when HPA is weak and interests on mortgages are high.
- Regulation attempts are not concrete yet but they raise fears of hindered access to credit and thus for a credit and liquidity crunch.

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<sup>152</sup> Atkins et al. (2007)

## 5 Conclusion

The first two chapters revealed how the mortgage market and the CDO market are linked and how their interaction drove growth in both industries. Mortgage lenders issued big numbers of mortgages and securitized them in the form of mortgage-backed securities. CDO managers were major buyers of those assets. The benefit for mortgage lenders was that the high demand of the CDO industry allowed them to stretch the underwriting of those loans. CDOs benefited because those mortgages and mortgage-backed securities offered an interesting variety of risk and return profiles that they forwarded to their investors. The subprime lending crisis disclosed drastic signs of overheating in this cycle between the mortgage industry and the CDO industry. There is evidence that prospects for the future are even worse.

The key findings of the preceding chapter prove that all major performance indicators that drive the performance of subprime-backed CDO portfolios move in disfavour for the CDO market. HPA will not recover on the short-run, because the supply of properties is actually higher than the demand for properties in the U.S.. Many adjustable-rate mortgages are yet to reset, which will accelerate delinquencies and defaults, which will spillover to the performance of mortgage-backed securities. Furthermore downgrading rates for subprime mortgage-backed securities will substantially pick up and many managing vehicles do not exhibit much experience in the CDO business. Considering the huge exposure that the CDO market has accumulated since 2000 it is not coming as a big surprise that the only possible conclusion suggests, that the CDO market has to expect a fallout resulting in rating downgrades and capital losses.

However, it is not yet possible to quantify how bad the turndown will hit CDOs, because the above-mentioned facts like rating downgrades or payment shocks for borrowers did not fully materialize yet. It is unlikely that losses will reach the most senior tranches, because the safety cushions that the subordinated tranches provide are too high. Nevertheless those subordinated slices are very vulnerable to be hit by the subprime woes, because they have to absorb initial losses. As indicated before, a major meltdown in values and ratings of these tranches could have severe consequences for the CDO market. Banks or investors that hold these bonds might be driven away from these investments due to two reasons. They are either not willing to take the high risks anymore or they are not allowed to take them anymore because of rating requirements that they have to consider when they select assets for their portfolios. Increased risk awareness would make it more difficult to market residual and low rated CDO tranches. In any case, CDO managers might face problems to create CDO deals in the future if demand for the subordinated tranches plunges, which could slow down CDO issuance volumes. Hence there is a considerable risk and probability that the subprime crisis will not only lead to losses right now but also deteriorate growth prospects for the future.

However the subprime turmoil initiated a period of self-regulation in the over-heated cycle between mortgage lenders and CDO originators. Mortgage lenders gave loans to the riskiest types of borrowers in order to stay in business. This led to shady lending practices. Now, the crisis drove many mortgage lenders out of business, which cools down the high concentration of competition in this industry and ceases the fight for mortgage borrowers at any price. Consequently the risk profile of mortgages is likely to ameliorate and not everybody will be able to qualify for a mortgage anymore like in recent years. Hence the risk profile of mortgage-backed securities that provide the raw material for the CDO market will enhance as well and once the CDO market has recovered from current troubles it may stand on more solid ground in the future.

It is not desirable that regulators intervene with stricter and tighter regulations, because financial markets are very nervous and vulnerable right now. Any sign of limited access to credit would further throw oil in the fire and raise concerns about a liquidity or credit crunch.

## Les différents aspects du CO<sub>2</sub>



**Antoine BURIN DES ROZIERES**, Docteur d'Etat en droit (Paris 1 1975), diplômé de l'IEP Paris (1970) et de l'Institut de droit comparé, licencié ès Lettres. Après 2 ans de coopération au Chili (1973-1975), il a accompli sa carrière dans un grand cabinet d'avocats d'affaires américain (Coudert Frères), la banque (direction juridique de la BFCE de 1978 à 1983), l'industrie (chef du service juridique de l'Aérospatiale de 1984 à 1989), le lobbying (AFEP) avant de rejoindre EDF en 1993 où, après avoir été responsable des relations bancaires du groupe de 1994 à 1999, il est devenu membre du Corps de Contrôle Général. Nommé en 1998, Conseiller du Commerce extérieur de la France, il est également juge depuis 2003 au Tribunal de Commerce de Paris. Administrateur et vice président du Cercle Montesquieu (depuis mai 2006), cercle qui réunit les directeurs juridiques de quelque 280 grandes entreprises françaises. Donnant des conférences en France et à l'étranger notamment dans le domaine des activités numériques, il enseigne à l'Université Paris 5 en Master 2 cette matière mais aussi le financement des projets internationaux. Auteur de plusieurs articles dans des revues juridiques et financières.

### I - Les marchés international et européen

En règle générale, la température moyenne à la surface de la terre augmente de 0,1 ° C tous les 1000 ans.

Mais la consommation croissante par l'homme de combustibles fossiles entraîne des rejets accrus de gaz carbonique dans l'atmosphère qui déséquilibrent un fragile équilibre climatique et conduisent à accélérer de manière dangereuse la hausse de la température : plus 0,6° C au cours du seul 20<sup>ème</sup> siècle. Le GIEC (Groupement d'experts intergouvernemental sur l'évolution du climat) prévoit une hausse de 1,4°C à 5,8°C d'ici la fin du siècle, une montée du niveau de la mer et des changements climatiques drastiques.

#### A) Le cadre international de la maîtrise des émissions de gaz à effet de serre (« GES »)

Signée lors du sommet de la terre à Rio en 1992, la Convention cadre de l'ONU sur les changements climatiques, ratifiée par 189 Etats, se fixe comme objectif de stabiliser les concentrations de GES, mais n'a pas de caractère contraignant.

En revanche, le Protocole de Kyoto de 1997, non encore ratifié par les Etats-Unis, mais entré en vigueur en 2005, fixe des objectifs juridiquement contraignants de réduction des émissions de GES dans les pays développés. En 2012, ces pays devront avoir globalement réduit de 5,2% leurs rejets de GES par rapport aux niveaux enregistrés en 1990. Chaque pays doit atteindre un objectif national précis.

Novateur, le Protocole ouvre un crédit aux pays signataires qui réduisent les émissions de GES dans d'autres pays par trois mécanismes de flexibilité à savoir :

- L'échange de quotas d'émission (« QE »),
- La mise en œuvre conjointe (« MOC »),
- Le mécanisme de développement propre (« MDP »).

1) L'échange de quotas d'émission fonctionne ainsi :

Chaque année, l'Etat attribue aux entreprises des secteurs les plus consommatrices d'énergie des QE de CO<sub>2</sub> et des limites de rejets. Le 30 avril de l'année suivante, l'entreprise doit restituer autant de quotas que de tonnes de CO<sub>2</sub> émises. Si les rejets dépassent le plafond, l'entreprise devra acheter, sauf à encourir une amende, sur un marché ou à d'autres industriels des quotas supplémentaires afin de

présenter un bilan équilibré. Ce système, aux Etats-Unis, a permis de réduire sensiblement les émissions de soufre.

2) La MOC, elle, permet à des entreprises de pays du Nord de financer des projets de réduction des émissions de CO<sub>2</sub> dans des pays d'Europe centrale et orientale. En contrepartie, l'investisseur reçoit des unités de réduction certifiée d'émissions utilisables pour son compte ou cessibles sur un marché.

3) Le MDP est le pendant de la MOC pour des projets dans des pays du Sud.

En son article 17, le Protocole prévoit la mise en place en 2008 d'un marché international de droits d'émission de GES.

## **B) Les initiatives de l'Union européenne**

1) Le cadre législatif

Pour se préparer à ce marché international, l'Union européenne a, de son côté, décidé de créer, par l'adoption de la directive « quotas » 2003/87/CE du 13/10/03, son propre système d'échange de QE.

Celle-ci a été modifiée par une directive « crédits » 2004/101/CE du 27/10/04 qui autorise l'inclusion des crédits résultant des activités de projet du Protocole dans le marché européen de QE par la conversion des crédits en quotas par les Etats membres. Les crédits résultant du MDP peuvent être utilisés par les exploitants dès 2005 et ceux provenant de la MOC à partir de 2008.

Le 1<sup>er</sup> janvier 2005 s'est donc ouvert au sein de l'UE un marché de QE. Il ne couvre, pour sa première période de fonctionnement (2005 à 2007), que le CO<sub>2</sub> ainsi qu'un nombre limité de secteurs d'activité, fortement émetteurs de CO<sub>2</sub> (industrie et production d'énergie).

L'UE s'est engagée à réduire ses émissions de GES en 2008-2012 de 8% par rapport à 1990.

Le Conseil européen des 8 et 9/03/07 a confirmé l'engagement ferme et unilatéral de l'Union européenne de réduire d'au moins 20% ses émissions de GES d'ici 2020 en attendant la conclusion d'un accord multilatéral mondial pour l'après 2012.

Par ailleurs, le Conseil s'est prononcé pour une réduction collective de 30% d'ici 2020 par rapport à 1990 en vue d'une réduction collective de 60 à 80 % d'ici 2050 et ce pour tous les pays développés.

2) Fonctionnement du marché européen de QE

Les Etats membres adoptent des Plans Nationaux d'Allocation de Quotas (« PNAQ ») qui fixent la quantité globale de quotas affectés aux installations établies sur leur territoire et visées par la directive (« plafond d'émission »).

En début d'année, l'exploitant se voit affecter un nombre donné de QE de CO<sub>2</sub>. Un quota représente l'émission d'une tonne de CO<sub>2</sub>. En fin d'année, l'exploitant devra restituer autant de quotas qu'il aura rejetés de tonnes de CO<sub>2</sub> au cours de l'année écoulée.

Les quotas peuvent dans certaines conditions être échangés entre installations (système « caps and trade »). Ainsi, pour remplir leurs obligations, les exploitants peuvent soit diminuer leurs propres émissions soit acheter des QE sur le marché communautaire.

Une amende de 40 euros par tonne de CO<sub>2</sub> excédentaire sanctionne tout dépassement au cours de la période 2005 à 2007. L'amende est portée à 100 euros à compter de 2008. Mais le paiement de l'amende ne dispense pas l'exploitant de restituer l'année suivante un nombre de quotas correspondant à ses émissions excédentaires.

Les Etats membres bénéficiant du plus gros pourcentage de quotas sont l'Allemagne (22,8%), le Royaume Uni (11,2%), la Pologne (10,9%), l'Italie (10,6%), l'Espagne (8%) et la France (7,1%).

L'objectif de ce marché est d'obtenir une réduction des émissions à un moindre coût.

### **C) Le cas de la France**

En décembre 2004, la France a fait adopter par la Commission, après révision, son premier projet de PNAQ. Il prévoit une allocation généreuse de quotas sous couvert de prévisions de croissance de la production établies en partie par les industriels eux-mêmes si bien que ces derniers de facto sont délégataires de l'élaboration du PNAQ.

Cependant, en 2006, la France, a dû, au grand dam de ses industriels, s'engager, à la demande de la Commission, à limiter ses émissions de GES à 132 Mt, comme en 2005, contre 150,3 Mt selon sa proposition initiale.

Le PNAQ doit remplir certains critères fixés par la directive, à savoir : compatibilité du plan avec l'obligation de limitation des émissions souscrite au titre du protocole de Kyoto, principe de non discrimination entre les entreprises, nécessité de garantir un accès aux nouveaux entrants, participation du public à l'élaboration du plan.

La marge de manœuvre des Etats membres, en principe importante dans la mesure où ce sont eux qui, selon les textes, déterminent la quantité globale de quotas à affecter sur leurs territoires et la méthodologie utilisée pour l'élaboration des PNAQ, est en réalité limitée.

### **D) Analyse des marchés et problématiques. L'émergence d'une finance carbone**

#### **1) Détermination du prix du carbone**

Le prix du carbone est déterminé en premier lieu par l'activité économique et le prix des matières énergétiques mais aussi par les plans d'allocation, la possibilité ou non de transférer les quotas d'une période sur l'autre (« banking »), l'avancement des mécanismes de projet MOC et MDP et bien sûr des facteurs d'incertitude tels que l'intervention des régulateurs européens, le rôle de la Russie, la période 2008-2012, et celle postérieure.

Des échanges de permis ont commencé dès 2003. D'octobre 2003 à février 2004, les permis s'échangeaient à des prix compris entre 11 et 14 euros la tonne. En mars et avril 2004, à l'annonce des premiers plans nationaux, les prix ont chuté jusqu'à moins de 7 euros la tonne.

Mais on observe une déconnexion croissante entre les prix de première période (2005-2007) en recul, pour des raisons climatiques, et ceux de deuxième période (2008-2012) en hausse en raison de la rareté prévue des quotas sur cette période.

La période 2005-2007 est une période d'apprentissage. Les PNAQ sont relativement peu ambitieux et ne requièrent pas de réduction significative des émissions par rapport aux évolutions tendanciennes, ce qui favorise l'établissement de prix peu élevés. Il faut attendre fin 2007 pour savoir si les quotas seront en excès et cela dépendra fortement des conditions météorologiques ainsi que de l'évolution de l'activité économique.

## 2) L'émergence d'une finance carbone

Plusieurs marchés au comptant ou à terme se sont créés à partir de 2005 pour capter ces échanges de QE.

Powernext Carbon, filiale conjointe de la CDC et d'Euronext, qui réalise plus de 60% du volume des échanges spots sur les marchés organisés, s'est alliée avec European Climate Exchange (ECX) cotant, elle, des contrats futures à Londres.

L'émergence de cette finance carbone suscite diverses problématiques à savoir notamment :

- Les contraintes et les obstacles pesant sur le développement à moyen et long terme de ces marchés international et européen de quotas d'émission,
- Les conséquences du refus des Etats-Unis de ratifier le Protocole de Kyoto et la nécessité de développer une stratégie transatlantique commune pour accélérer la recherche sur les technologies propres,
- La participation des pays en développement aux marchés des permis d'émission qui, pour le moment, se fait exclusivement à travers le mécanisme de développement propre,
- L'impact des politiques climatiques sur le prix du carbone et les marchés de l'énergie,
- L'optimisation des procédures d'allocation des quotas et la préparation des plans nationaux, eu égard aux difficultés rencontrées encore récemment.

Le bilan du marché européen du CO2 au terme de sa deuxième année de fonctionnement est positif : fin 2006, le volume total des QE échangés correspond à environ 40% de l'allocation totale. Le marché a gagné également en profondeur avec l'augmentation du nombre de participants actifs et sa liquidité a progressé.

Pour autant, la volatilité des cours demeure forte, compromettant un bon décryptage du signal prix par les industriels.

Comme la deuxième phase du marché européen (2008 à 2012) coïncide avec la mise en œuvre des engagements de Kyoto pour les Etats, les marchés seront imbriqués à divers niveaux.

L'élargissement de l'UE avec l'entrée de la Roumanie et de la Bulgarie et l'inclusion du secteur aérien dans le système européen des quotas à compter de 2011 auront un impact sur l'ensemble des marchés du CO2.

Ce changement de périmètre associé au durcissement des contraintes imposées par la Commission lors de l'approbation des plans d'allocation suscite un défi pour les industriels de plus en plus nombreux à entrer sur ces marchés.



## II. Aspects juridiques et comptables

Pour apprécier les opportunités financières qu'offrent les transactions sur quotas d'émission de gaz à effet de serre (« QE ») il convient d'abord de préciser la nature juridique de ces quotas.

Adoptant à juste titre une démarche pragmatique et progressive, la Commission européenne n'a pas souhaité, lors de l'élaboration des directives 2003/87 du 13/10/03 et 2004/101 du 27/10/04, peaufiner ces textes au point, par un souci excessif de perfectionnisme, d'en retarder l'adoption.

C'est ainsi qu'on ne trouvera pas de précision sur la nature juridique de ces quotas dans la législation communautaire ni dans les communications de la Commission.

En France, la doctrine s'est divisée sur la nature juridique de ces quotas.

Selon le rapport Landwell et Price Waterhouse d'avril 2003 commandé par la Mission Climat de la Caisse des Dépôts et Consignations sur les aspects juridiques et comptables des quotas d'émission de gaz à effet de serre, il convient de distinguer entre l'autorisation d'émettre, acte administratif unilatéral, et le quota d'émission qui, lui, relève du droit privé.

Le quota d'émission n'est pas seulement un droit susceptible d'être négocié sur un marché, il a aussi, pour l'exploitant, une fonction probatoire. En effet, le 30 avril de chaque année au plus tard, l'exploitant doit restituer un nombre de quotas équivalent à ses émissions de l'année écoulée. Chaque Etat membre vérifie et contrôle les quotas délivrés, détenus, transférés et annulés grâce à des registres établis et tenus par lui.

Son caractère patrimonial, au-delà de sa gratuité d'origine, et de sa transmissibilité, conduit à exclure le quota d'émission du droit administratif.

Il ne relève pas non plus de la catégorie des droits de créance (droits personnels) : ce n'est pas un droit exercé contre un débiteur que serait par exemple l'Etat.

Faute de s'analyser comme un droit de créance, le quota d'émission ne peut être assimilé à une obligation au sens de l'article L 213-5 du Code monétaire et financier.

Il ne relève pas non plus de la catégorie des droits de propriété intellectuelle, qui supposent un monopole d'exploitation pour le titulaire de ces droits.

Le quota d'émission n'est pas un contrat, il ne constitue pas une opération dont l'exécution est différée dans le temps et il ne se propose pas de couvrir un risque de marché ou de contrepartie. Il n'a pas pour finalité la spéculation ou l'arbitrage.

Le quota d'émission n'est pas non plus un titre d'Etat : il ne donne pas accès à un droit de créance sur l'Etat et ne se traduit pas par la comptabilisation d'une dette dans la comptabilité publique.

Dès lors quelle est donc la nature juridique du quota d'émission s'il échappe à toutes les catégories recensées par le législateur ?

Relève-t-il des droits réels (droits de propriété) ?

Certes, son inscription en compte crée une présomption simple de propriété, mais les directives européennes ne qualifient pas le quota d'émission de droit et ne le rangent pas expressément dans la catégorie des droits de propriété.

Le système du SO<sub>2</sub> aux Etats-Unis exclut pour les « allowances », très similaires aux quotas d'émission, tout droit de propriété pour mieux en souligner le caractère moral.

A l'inverse de Landwell et Price Waterhouse qui considèrent en l'état des textes d'alors (en 2003) le quota d'émission de GES comme un actif sui generis, S. Giulj en 2004, faisant le rapprochement avec le quota laitier, insiste sur son caractère administratif d'instrument de contingentement limité dans le temps.

Le législateur a tranché cette controverse dans l'ordonnance no 2004-330 du 15 avril 2004 transposant la directive du 13 octobre 2003 en définissant à l'article L 229-15 du code de l'environnement les quotas d'émission de GES comme « ... des biens meubles exclusivement matérialisés par une inscription au compte de leur détenteur dans le registre national... » tenu par la CDC.

Il précise : « Ils sont négociables, transmissibles par virement de compte à compte et confèrent des droits identiques à leurs détenteurs. Ils peuvent être cédés dès leur délivrance ... »

Le législateur, toujours par l'ordonnance du 15 avril 2004, a inclus ces quotas dans la liste des instruments financiers à terme mentionnés à l'article L 211-1 II du code monétaire et financier : « ... les instruments financiers à terme sur toutes marchandises ou quotas d'émission de gaz à effet de serre, soit lorsqu'ils font l'objet, en suite de négociation, d'un enregistrement par une chambre de compensation d'instruments financiers ou d'appels de couvertures périodiques, soit lorsqu'ils offrent la possibilité que les marchandises sous-jacentes ne soient pas livrées moyennant un règlement monétaire par le vendeur. »

Le **traitement comptable** du quota d'émission de GES est précisé dans le Règlement no 2004-08 du CRC du 23/11/04. Deux modalités de comptabilisation existent selon qu'il s'agit d'exploitations soumises à l'obligation de réduction des émissions de GES ou agissant dans le cadre d'une activité de placement.

Dans le premier cas, les QE étant des immobilisations acquises gratuitement, ils seront évalués à leur valeur vénale à la date de leur inscription sur le registre national. L'obligation de les restituer se traduit par la constatation d'un passif correspondant.

Dans le deuxième cas, les QE sont comptabilisés à l'actif comme des titres conférant un droit de propriété cessible sans contrepartie au passif.

La transmissibilité des QE permet à un marché secondaire de se développer. La directive 2003/87 et l'ordonnance du 15/04/04 étendent en effet le bénéfice de ces garanties à « toute personne physique ou morale ».

Les QE peuvent être cédés mais aussi, en tant que biens meubles incorporels, être nantis. Faute de dispositions spéciales dans le code de l'environnement et en application de l'article 2355 du code civil, les QE sont soumis aux dispositions concernant le gage de meuble corporel dont l'inscription sur un registre spécial.

A défaut de paiement de la dette garantie, le créancier pourra ainsi faire ordonner en justice la vente des QE nantis ou leur maintien en paiement.

Instrument financier à terme, susceptible de nantissement, le quota d'émission offre de nombreuses applications financières dont la titrisation.

Pour autant, l'harmonisation au plan international de son régime juridique et comptable demeure souhaitable afin d'éviter des conflits de lois et d'assurer la sécurité juridique de ces marchés appelés à se développer.

### Eléments de droit comparé

- Le système américain est comme le système français fondé sur la distinction entre autorisation d'émettre et QE (allowance).

**Aux Etats-Unis**, le Clean Air Act de 1990 dispose, en matière de SO<sub>2</sub>, que les « allowances » ou permis négociables ne constituent pas juridiquement un droit de propriété.

L'agence américaine de protection de l'environnement (« EPA ») attribue les allowances aux exploitants des sources de pollution (usines). Les transferts d'allowances sont enregistrés dans un registre tenu par EPA.

En fin d'année, EPA annule les allowances utilisés et vérifie qu'un opérateur économique n'a pas émis plus de SO<sub>2</sub> qu'il ne disposait d'allowances.

Les allowances non utilisés au cours d'une année peuvent être reportés sur l'année suivante (banking). Ces allowances peuvent être utilisés comme sous-jacent dans les instruments financiers à terme ou produits dérivés.

- **Au Royaume Uni**, les ROC (Renewable Obligation Certificates) sont des certificats verts pour la promotion des énergies renouvelables. Ils ne dérivent pas, à la différence des QE ou allowances, d'une autorisation d'émettre.

Depuis 2002, les distributeurs d'électricité doivent fournir aux consommateurs anglais une certaine quantité d'électricité produite à partir de sources d'énergie renouvelables et en justifier auprès du régulateur l'OFGEM.

Celui-ci émet les ROC et en assure l'enregistrement. Ces ROC sont négociables et le banking est autorisé.

### Bibliographie

- Ministère de l'Ecologie et du Développement durable : *Guide pratique du marché des quotas d'émission de CO<sub>2</sub>*
- PriceWaterhouse Coopers et Landwell : *Aspects juridiques et comptables des quotas d'émission de gaz à effet de serre (2003)*
- Site de la Mission Climat de la Caisse des Dépôts et Consignations
- S. Giulj : « *Les quotas d'émission de gaz à effet de serre : la problématique de la nature juridique des quotas et ses implications en matière comptable et fiscale* » in Bulletin Joly Bourse no 1 janvier 2004
- P. Thieffry : *La « titrisation » des quotas d'émission de gaz à effet de serre* in BDEI Supplément au no 10 - juillet 2007
- Site de Powernext
- Revue d'Economie Financière « Carbon Finance » no 83 - octobre 2006

## La gestion des données : Nouvel enjeu imposé par la Mifid



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Le paysage boursier européen a changé fin 2007 avec la mise en place de la nouvelle directive européenne sur les services d'investissement : La Mifid, entrée en vigueur le 1<sup>er</sup> novembre 2007, a pour objet d'accroître la concurrence entre les acteurs financiers car les bourses traditionnelles ont perdu leur monopole. En conséquence, les intermédiaires sont désormais soumis à des contraintes en matière de gestion de données. Pour assurer une parfaite transparence face à la multiplicité des prix et une équité *ad hoc*, ils doivent classer leurs clients, pour ensuite leur présenter les conditions d'exécution des ordres. Ils sont donc contraints à s'adapter pour collecter les informations en amont et en aval de la gestion des ordres.

Après avoir présenté les principes généraux et les obligations de la Mifid, nous nous focalisons sur les contraintes qui pèsent sur la connaissance des clients d'une part et sur la gestion des données relatives aux conditions d'exécution d'autre part. Enfin, nous terminons sur l'enjeu stratégique qui s'ouvre aux banques et les coûts induits par la Mifid.

### 1. La Mifid et ses contraintes

#### 1.1 Pour une mise en concurrence de tous les acteurs

La DSI – Directive sur les services d'investissement de 1993, préalable nécessaire à la mise en place de l'Euro, avait pour objet d'élaborer la notion de passeport européen pour les entreprises d'investissement et de définir celle de marché réglementé.

La Mifid - *Market in Financial Investment Directive* - a été conçue dans la continuité de cette DSI en vue de créer un réel marché financier européen en permettant à tous les acteurs d'opérer dans les mêmes conditions de concurrence, quelque soit leur lieu ou fonction. Son objectif final est celui de la banalisation des transactions transfrontalières, c'est-à-dire l'augmentation de leur efficacité et de la rapidité de traitement pour en diminuer les coûts, tout en offrant la meilleure protection aux investisseurs. Elle s'inscrit dans une démarche à moyen terme née avec le Plan d'action sur les services financiers de la Communauté européenne de 1999. Elle a été adoptée par le Conseil et publiée au JO de l'Union européenne en mars – avril 2004 et sa mise en place est définitive depuis le 1<sup>er</sup> novembre 2007.

La Mifid instaure un cadre réglementaire concurrentiel à tous les opérateurs habilités à exécuter

les ordres sur tous les produits financiers (actions, obligations, dérivés, matières premières...) et renforce la protection des investisseurs en garantissant une transparence parfaite et en améliorant les procédures de contrôle par les autorités.

Ses concepts clés sont : régulation des plates-formes électroniques de négociation, internalisation des ordres, encadrement du conseil en investissement, passeport européen élargi, réglementation de tous les instruments financiers, condition de meilleure exécution des ordres, transparence *pre* et *post* négociation, nouvelle classification des clients, prévention des conflits d'intérêt<sup>1</sup>.

Parce que la Mifid s'appuie sur la perte de monopole des bourses au profit des non-bourses, faisant perdre aux premières leurs prérogatives historiques<sup>2</sup>, elle impose aux seconds, et plus particulièrement aux prestataires en services d'investissement (ci-après PSI) des règles précises en matière d'informations à collecter auprès des clients en termes de connaissances, d'expérience et d'objectifs. Avec ces éléments, ledit intermédiaire vérifie que le produit est correctement adapté à son client.

Au final, les enjeux de la Mifid se synthétisent comme suit<sup>3</sup> :

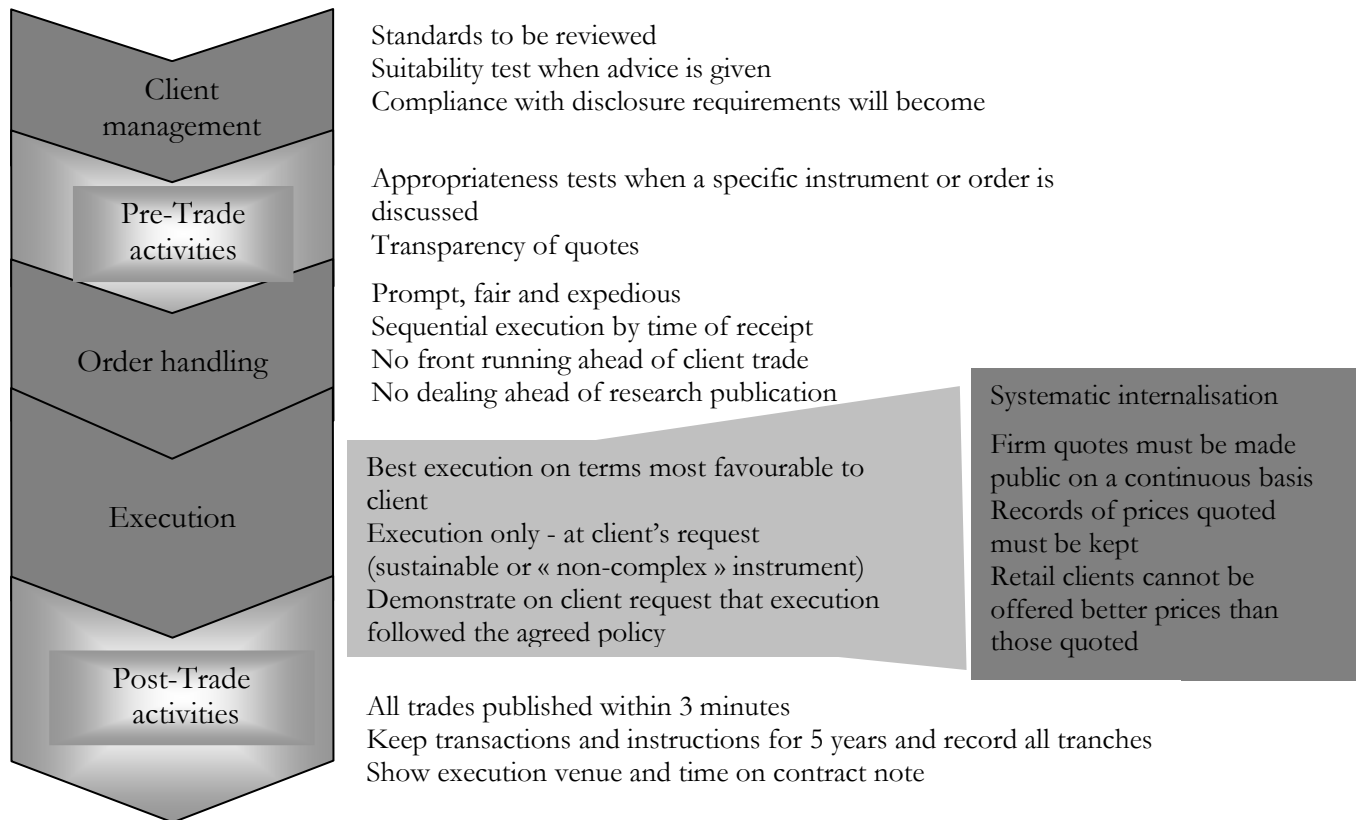
Classification des clients	Informations aux clients	Suitability & appropriatness	Organisation & gouvernance	Sauvegarde des actifs des clients
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Clients de détail</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Professionnels</div> <div style="border: 1px solid black; padding: 5px;">Contreparties éligibles</div>	Services d'investissement  Conseil en investissement  Gestion de portefeuille  Exécution d'ordres  Placements  Services	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Entreprise</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Entreprises d'investissement</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Institutions de crédit</div> <div style="border: 1px solid black; padding: 5px;">Sociétés de gestion</div>	Services d'investissement  Exécution d'ordres  Négociation pour compte propre  Exploitation de MTF	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Lieux d'exécution</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Marchés réglementés</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">MTF</div> <div style="border: 1px solid black; padding: 5px;">Internalisateur systématique</div>
Traitement des ordres des clients	Meilleure exécution	Transparence pre/post trade	Reporting des transactions	Gestion des données

<sup>1</sup> Karyotis C. (2006), « La Mifid: Big-bang sur les places financières européennes », *Banque Stratégie*, juillet.

<sup>2</sup> Karyotis C. (2007), « La disparition des bourses nationales », *Expansion Management Review* n°147, Hiver, p. 38-47.

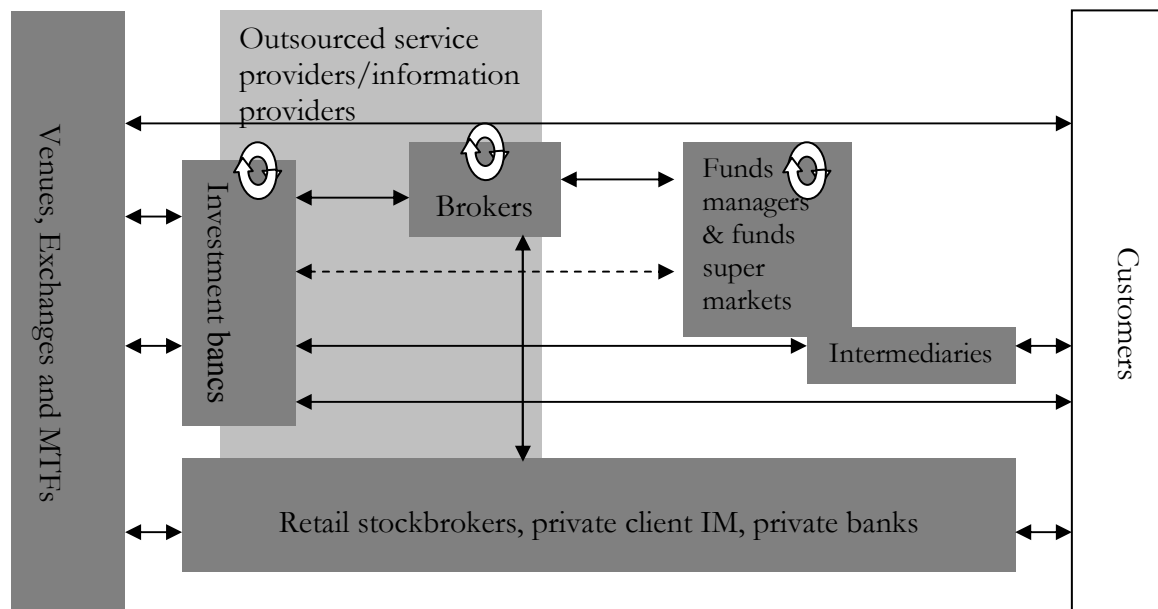
<sup>3</sup> Henniaux E., Vinck (de) O. (2006), « Mifid, Révolution ou évolution », *Luxembourg Wort*, 26.09.

La hiérarchisation des impacts se présente comme suit<sup>4</sup> :



Notons qu'elle concerne tous les échelons de la chaîne de valeur des titres, à l'exclusion des procédures de règlement-livraison de titres.

Les acteurs concernés le sont comme suit :



Le point central est l'ouverture à la concurrence du métier traditionnel et monopolistique des bourses, la gestion des négociations. Les systèmes de cotation électroniques et les banques (appelées

<sup>4</sup> Atos Consulting, Countdown to the Mifid deadline, White Paper 2005.

internalisateur<sup>5</sup>) pourront exécuter les ordres. Afin de protéger les investisseurs, les intermédiaires (banques, bourses, MTF<sup>6</sup>) sont tenues à l'obligation de *best execution* qui consiste à assurer les meilleures conditions d'exécution des ordres en tenant compte du prix, du coût, de la rapidité et de la probabilité d'exécution. Corollaire de ce principe, une transparence *pre et post* négociation est requise : pour tous les actifs financiers, il existe des standards minimum de transparence *pre trade* à respecter par les marchés réglementés ou les MTF (gouvernés par les prix ou les ordres) ; et les internalisateurs doivent, sur les valeurs les plus liquides, publier les prix acheteurs et vendeurs en continu aux heures de marché, et sont tenus d'exécuter les transactions au meilleur prix. La transparence *post trade* concerne tous ces instruments négociés sur un marché réglementé ou OTC<sup>7</sup>, ces informations devant être transmises au régulateur du pays d'origine (et non plus du régulateur du marché sur lequel l'instrument est négocié).

Enfin, la gestion client et le *reporting* sont bouleversés : une classification des clients est imposée (clients de détail, professionnels et contreparties éligibles) pour unifier leur protection. En outre, la Mifid introduit la notion de *compliance* et de *convenance* : les entreprises d'investissement doivent obtenir des informations de leurs clients et vérifier qu'ils ont l'expérience nécessaire pour comprendre les risques. En matière de gestion des conflits, les intermédiaires doivent agir dans les meilleurs intérêts des clients : des arrangements nécessaires pour assurer, avec une confiance suffisante, que les risques de dommage des clients sont gérés à l'avance.

## 1.2 Quatre concepts importants pour la gestion des informations

Globalement l'impact de la Mifid se décline en quatre concepts fondamentaux<sup>8</sup> :

- La classification des clients :

La Mifid a mis en place trois catégories de clients (contreparties éligibles, clients professionnels et clients particuliers) qui amènent une gestion des informations différentes ; car, même si une classification de la clientèle existe depuis longtemps dans les banques, elle est pour la première fois uniformisée et réglementée.

Les contreparties éligibles et les clients professionnels autorisent l'entreprise d'investissement à une plus grande souplesse dans les procédures. Les services sont alors plus ciblés et fournis à moindre coût. En revanche, les clients particuliers amènent à une gestion poussée des informations. Un client est dit professionnel lorsqu'il possède l'expérience, les connaissances et la compétence nécessaires pour prendre ses propres décisions d'investissement et évaluer correctement les risques encourus. On recense les professionnels par nature (entreprises d'investissement, assurances, Opvcvm et sociétés de gestion, grandes entreprises, gouvernements, organismes publics gérant la dette publique, banques centrales... bénéficiant d'un *opt-out*) et les clients professionnels sur option (organismes du secteur public et investisseurs particuliers décidant de renoncer à une partie de la protection que leur offrent les règles de conduite bénéficiant d'un *opt-in*).

<sup>5</sup> Un internalisateur est une société d'investissement habilitée à exécuter directement les ordres de son client, sans passer par le marché réglementé, en trouvant la contrepartie de l'ordre chez un tiers ou chez lui. On parle d'internalisateur systématique.

<sup>6</sup> MTF - multilateral trading facility : système informatique de négociation géré par une entreprise d'investissement ou une entreprise de marché permettant l'appariement des ordres d'achat et de vente sur des instruments financiers en vue d'une négociation.

On parle d'ATS ou ECN : Un ATS - *alternative trading system*, est un système automatisé d'exécution des ordres qui offre des fonctionnalités de *matching* et d'exécution reposant sur l'internalisation. Un ECN - *electronic communication network* est un système de *matching* automatique des ordres entre acheteurs et vendeurs (le terme d'Ecn s'applique à des réseaux privés). L'exécution des ordres passant par un Ecn reste externalisée, donc effectuée par une bourse réglementée.

<sup>7</sup> OTC - Over the counter.

<sup>8</sup> Karyotis C., La Mifid : Un enrichissement des données et une meilleure connaissance des clients, Conférence francophone « Gestion des connaissances, société et organisations », ESC Troyes, 13-14 mai 2008.

Les contreparties éligibles sont les entreprises d'investissement (banques et assurances) et les Opvcvm (et leur société de gestion) pour les *opt-out*, et les entreprises pour les *opt-in*. Selon le type de client, l'intermédiaire est tenu de transmettre des informations sur lui-même et ses prestations, sur les coûts et frais divers et toute information relative aux conditions préalables d'exécution et risques attenants, afin que ledit client puisse appréhender correctement les produits offerts.

A l'inverse, la Mifid requiert aux intermédiaires le recueil d'informations sur le client (connaissance des marchés, politique d'investissement et situation financière), afin de pouvoir vérifier que le produit ou le service proposé est adapté au client.

- La notion de *best execution* :

Celle-ci consiste en une obligation de moyen d'exécuter les ordres aux meilleures conditions pour le client, en fonction du prix, de la rapidité, de la taille et nature de l'ordre, la probabilité d'exécution et du règlement – livraison. Le PSI doit définir une politique d'exécution des ordres (PEO). Elle concerne tous les instruments et tous les intermédiaires qui exécutent les ordres (négoceurs, *dealers* et *brokers-dealers*) mais également les intermédiaires qui transmettent les ordres (gestionnaires de portefeuilles, *introducers* ou routeurs d'ordres) ; tout PSI doit avoir une politique d'exécution pour obtenir les meilleurs résultats pour exécuter les ordres (outre le cours, il doit tenir compte du coût, de la rapidité et probabilité de l'exécution et du règlement).

- La transparence *pre et post trade*

Elle s'entend, pour toutes les valeurs admises sur un marché réglementé, comme la publicité des prix acheteurs et vendeurs et les volumes, la publicité immédiate des informations relatives aux transactions (prix, volume et horodatage) et l'enrichissement des avis d'opérés et *reporting* clients (lieux d'exécution, heure de négociation et frais).

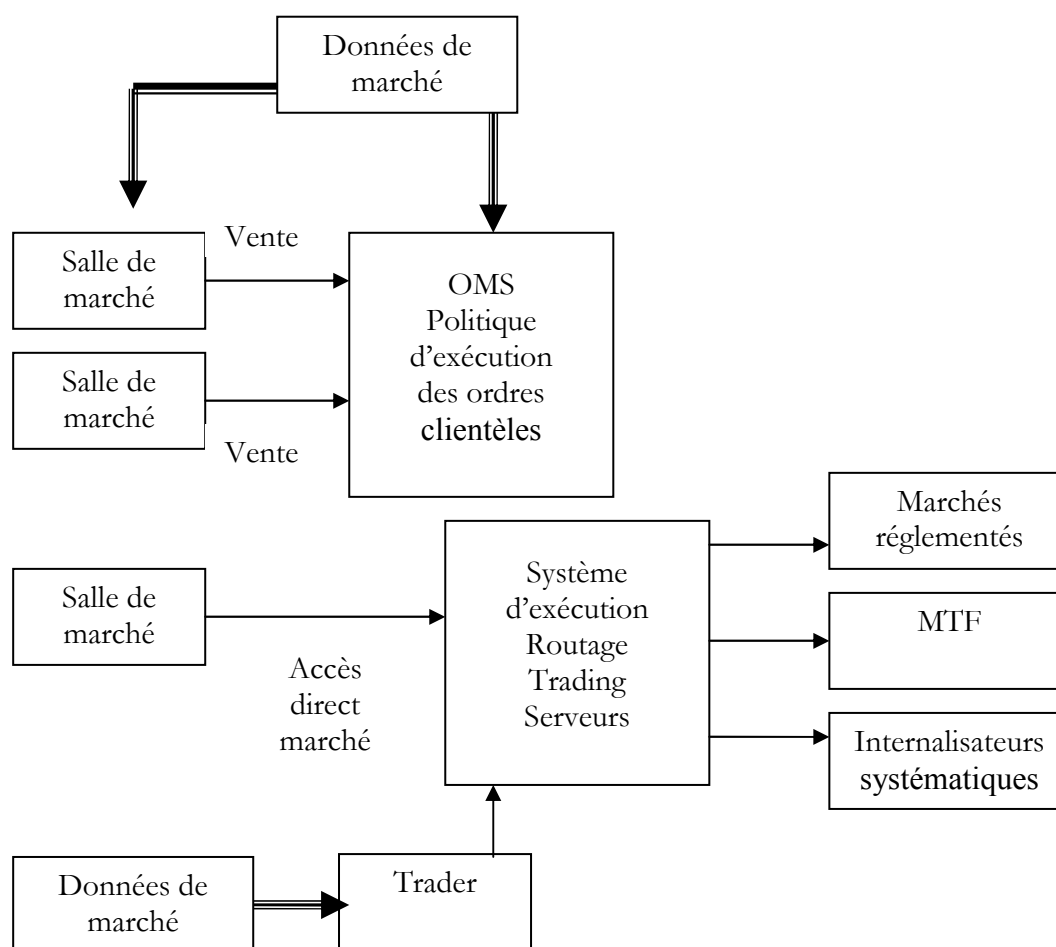
- Le *reporting* :

Dans la continuité de la transparence susnommée, une déclaration unique des transactions est à effectuer auprès du régulateur du pays du prestataire et aux autorités locales pour les succursales étrangères, pour tous les instruments financiers. Ladite déclaration se fait en direct, *via* les systèmes de négociation ou *via* un système tiers agréé. Et les PSI sont tenus de conserver 5 ans les caractéristiques des transactions conclues.



## 2. La nouvelle gestion des informations

Aujourd'hui, un flux d'ordre emprunte le chemin suivant<sup>9</sup> :



Les référentiels des intermédiaires doivent donc être adaptés pour tenir compte de la classification de la clientèle d'une part, et des contrats ou mandats de gestion avec ladite clientèle, d'autre part. Et, selon le canal de distribution retenu (agence, phoning ou site Internet), l'adéquation du service ou produit avec le client doit être gérée par le système, tout comme la traçabilité des mouvements.

En matière de gestion des ordres, le système doit prendre en compte les *reporting* à transmettre au client avec décomposition des coûts, le tout pendant 5 ans.

Les systèmes d'exécution des ordres doivent s'adapter : les OMS – *Order management systems* reposent désormais sur des algorithmes à même de gérer les ordres en temps réel, c'est-à-dire d'instruire le client sur le lieu d'exécution en fonction des conditions de marché, de l'instrument négocié et de la catégorie dudit client. Ensuite, les systèmes doivent prouver au client que la notion *best execution* a été respectée.

<sup>9</sup> GL Trade (Agefi Hebdo, 13-21 novembre 2007).

Enfin, compte tenu des différents lieux potentiels d'exécution des ordres et de leur gestion post-bourse éventuellement différente, les formats d'échange pourraient différer, les intermédiaires sont donc obligés de prévoir des connexions multiples pour respecter la règle de transparence *pre et post trade*.

## 2.1 La *best execution* et ses contraintes

Le concept de *best execution* n'est pas récent, il existe aux Etats-Unis depuis les années 70. Il n'y a cependant pas de définition universelle de cette fonctionnalité. Cette notion comporte plusieurs facteurs qualitatifs et quantitatifs (délai d'exécution, frais et taxes, prix d'exécution, niveau de fragmentation de l'exécution), auxquels il convient de rajouter le règlement-livraison et le risque de contrepartie pour les négociations OTC.

Dès lors, un ordre est considéré comme exécuté au mieux si :

- les conditions et les paramètres de l'exécution de l'ordre se conforment aux besoins des clients au niveau du délai et de la fragmentation, de la place d'exécution et de l'obtention du meilleur prix tous frais compris,
- L'*«implementation shortfall»*, ou différence entre le prix du titre au moment de la décision d'investissement et le prix d'exécution incluant la totalité des frais et taxes, est optimal par référence aux besoins du client et aux conditions de marché<sup>10</sup>.

Cette notion consiste en une valorisation du coût en valeur réelle et non relative comme le benchmark.

## 2.2 La gestion de la transparence

Dès lors que les bourses traditionnelles ont perdu leur monopole, la transparence est synonyme de compétitivité des différents lieux d'exécution des ordres. La Mifid s'appuie sur une connaissance plus grande des clients des PSI et sur une information intelligible des produits et services financiers.

Les obligations d'information sont désormais formalisées, quant à l'information préalable du client (informations claires, appropriées et proportionnées en fonction des produits) et quant à l'exécution des ordres (diffusion de la politique d'exécution et conformité de l'opération) avec des obligations de traçabilité et d'archivage.

Une déclaration unique des transactions est à effectuer auprès du régulateur du pays du prestataire et aux autorités locales pour les succursales étrangères, pour tous les instruments financiers. Ladite déclaration se fait en direct, *via* les systèmes de négociation ou *via* un système tiers agréé.

Enfin, les PSI sont tenus de conserver 5 ans les transactions conclues. La transparence *pre et post trade* oblige donc les PSI à chercher en permanence les prix sur tous les lieux d'exécution.

Les règles de transparence à respecter par les marchés et les internalisateurs existent à 2 niveaux :

- Avant la négociation, les PSI sont tenus d'informer leurs clients sur les prix acheteurs et vendeurs avec les volumes, les conditions commerciales et les dérogations ou les types et tailles des ordres (blocs) pour les marchés ; leurs intérêts à l'achat et à la vente et les titres sur lesquels ils sont internalisateurs, pour les internalisateurs systématiques.
- Après la négociation, tous doivent diffuser les volumes, prix et heures des transactions (en temps réel).

<sup>10</sup> Giraud J.R. (2004), « Best Execution : Mythe, réalité ou opportunité », *Asset Management* n°16, mai.

La transparence des marchés financiers est une condition d'efficience. O'Hara<sup>11</sup> la définit comme étant la capacité des acteurs à observer les informations relatives au processus de transaction. Biais<sup>12</sup>, comparant la transparence des marchés centralisés à celle des marchés fragmentés, conclut à une meilleure transparence des premiers parce que les ordres convergent vers un lieu unique. Si le marché est décentralisé, à l'instar de ceux d'aujourd'hui en Europe, les négociations sont bilatérales, les autres participants non impliqués par lesdites négociations ne sont alors pas informés. Un marché fragmenté est de facto plus opaque s'il n'existe pas de contraintes réglementaires pour inverser la tendance.

La Mifid légitime la concurrence des MTF en Europe, mais celle-ci existe depuis longtemps aux Etats-Unis ; elle peut donc être étudiée de façon rétroactive. Ainsi Hendershott & Jones<sup>13</sup> ont-ils examiné l'impact de la suppression de la diffusion du carnet d'ordres chez l'Ecn Island : lorsque cette bourse électronique a cessé la diffusion du carnet sur 3 trackers, les coûts de transaction ont augmenté et la vitesse d'ajustement des prix a diminué. Un an plus tard, lorsque le carnet d'ordres a été rediffusé, on a observé le phénomène inverse.

La transparence *pre trade* apparaît donc comme source d'efficience.

L'impact de la transparence *post trade* a essentiellement lieu d'être dans le délai de diffusion des informations. Une étude empirique (Edwards et al. 2007) sur le Nyse et son système Trace montre qu'une diffusion des conditions d'exécution des ordres sur les obligations (dans un délai de 45 minutes) a permis de réduire les transactions<sup>14</sup>.

In fine, la transparence permet d'accroître l'efficience informationnelle et d'améliorer l'efficacité d'un marché (Degryse H. 2007, Majois 2007).

### 3. La gestion des données : une arme stratégique pour les banques

#### 3.1. Données et connaissance chez les prestataires<sup>15</sup>

La richesse d'une banque est davantage dans le jeu d'écritures échangées avec sa clientèle, concentré dans son système d'information, que dans ses coffres<sup>16</sup>. Le métier de la banque est alors axé sur la gestion des informations et des connaissances. La banque dispose certes d'actifs physiques, mais elle est surtout une entreprise gérant des informations, elle offre à ses clients des connaissances, de l'expérience et des informations<sup>17</sup>.

Les informations s'assimilent à des flux de messages, la connaissance implique davantage l'activité cognitive des agents qui utilisent des flux d'informations pour produire de nouvelles connaissances<sup>18</sup>. Les éléments cognitifs font référence à la connaissance tacite, par opposition à la

<sup>11</sup> O'Hara M. (1995), *Market microstructure theory*, Blackwell.

<sup>12</sup> Biais B. (1993), "Price formation and equilibrium liquidity in fragmented and centralized markets", *Journal of Finance* n°48 Issue 1, p. 157-185.

<sup>13</sup> Hendershott T., Jones C.M. (2005), "Island goes dark: Transparency, fragmentation and regulation", *Review of Financial Studies* n°18 Issue 3, p. 743-793.

<sup>14</sup> Edwards A.K., Harris L.E., Piwowar M.S. (2007), Corporate bond market transaction costs and transparency, *The Journal of Finance* Vol. 62 Nber 3, June, p. 1421-1451.

<sup>15</sup> Karyotis C., La Mifid : Un enrichissement des données et une meilleure connaissance des clients, Conférence francophone « Gestion des connaissances, société et organisations », ESC Troyes, 13-14 mai 2008.

<sup>16</sup> Delaroche P. (2004), « L'ère de la gouvernance », *L'Expansion* 1<sup>er</sup> septembre.

<sup>17</sup> Heng M. (2006), "Research note: Domain knowledge as corporate resource of financial firms", *Global Working Papers Series*, Issue 5, October.

<sup>18</sup> Mouhoud E.M., Plihon D. (2005), « Finance et économie de la connaissance : des relations équivoques », *Communication au séminaire du Matisse*, 29 novembre.

connaissance explicite, c'est-à-dire formalisée<sup>19</sup>. La connaissance s'entend comme de l'information interprétée par le récepteur mais combinée avec de l'expérience dans un contexte précis<sup>20</sup>. Elle est un stock d'informations maîtrisées par une entité, interprétées au moyen d'un modèle cognitif<sup>21</sup>. Et l'information n'a de valeur que si celui qui la reçoit est en mesure de lui donner du sens, de maîtriser les langages nécessaires à sa compréhension puis à son appropriation dans l'action<sup>22</sup>.

Plutôt que de chercher une définition unique, l'approche polymorphe d'Alavi et Leidner<sup>23</sup> semble plus opportune pour les intermédiaires financiers dans le contexte de la Mifid. Ils abordent la définition de la connaissance par son statut : les données sont des chiffres bruts qui sont interprétés pour donner des informations, qui sont alors replacées dans un contexte précis pour fournir des connaissances. Les connaissances permettent ensuite de comprendre la situation, elles sont stockables et permettent l'exercice d'une expertise qui pourra enfin diriger une action.

L'article 19-4 de la Mifid stipule que le PSI doit se procurer les informations nécessaires concernant les connaissances et l'expérience du client en matière d'investissement en rapport avec le type spécifique de produit ou service, sa situation financière et ses objectifs d'investissement, de manière à pouvoir lui recommander les services et instruments financiers qui lui conviennent. C'est le principe de suitability test et de l'appropriateness test, évoqués ci-dessus.

En conséquence, la connaissance du client entre dans le concept global de la connaissance développé par Ballay<sup>24</sup> selon lequel celle-ci résulte de trois ressources : l'expérience, les informations détenues et les avoirs acquis. La connaissance est de l'information combinée avec l'expérience, mais dans un contexte donné, avec interprétation et réflexion<sup>25</sup> ; elle relève d'un cadre permettant d'évaluer et d'intégrer une expérience et une information<sup>26</sup>.

La connaissance représente un avantage concurrentiel déterminant<sup>27</sup>, et ce qui vaut dans l'industrie vaut selon nous dans la banque. Ermine estime que la possession d'un outil de production performant n'est plus gage de compétitivité, il faut développer une assurance qualité pour vendre le meilleur produit possible, et là intervient la gestion des connaissances.

Avec la Mifid, les PSI doivent connaître leurs clients pour leur vendre des financiers appropriés.

La connaissance des clients et les informations à leur communiquer représentent la pierre angulaire de la Mifid. Aussi cette directive enrichit-elle l'information à diffuser par les acteurs financiers en amont et en aval des négociations.

La Mifid impacte notamment les acteurs financiers pour la gestion des données au titre de la gestion de la relation client, et ce à 3 niveaux :

- la segmentation de la clientèle qui oblige les entreprises d'investissement à développer leurs outils de business intelligence (informatique décisionnelle, terme apparu dans les années 80 pour faire référence à l'analyse de performance élaborée à partir d'outil de *reporting* et d'analyse de gestion<sup>28</sup>),

<sup>19</sup> Polanyi M. (1966), *The tacit dimension*, Routledge & Kegan Paul.

Nonaka I., Takeuchi H. (1997), La connaissance créatrice : La dynamique de l'entreprise apprenante, De Boeck.

<sup>20</sup> Davenport T.H., De Long D., Beers C., "Successful knowledge management projects", *Sloan Management Review*, p. 43-57, Winter.

<sup>21</sup> Reix R. (2004), *Systèmes d'information et management des organisations* 5ème édition, Vuibert.

<sup>22</sup> Prax J.Y. (1997), *Manager la connaissance dans l'entreprise*, Insep Editions.

<sup>23</sup> Alavi M., Leidner D. (1999), "Knowledge management and knowledge management systems: Conceptual foundations and research issues", *Working Paper Insead* 99-34/TM.

<sup>24</sup> Ballais J.F. (1999), « Le rôle de l'information et des hommes dans la gestion des connaissances » in Dupoirier

<sup>25</sup> Davenport T.H., Prusak L. (1998), *Working Knowledge*, Harvard Business School.

<sup>26</sup> Marr B., Spender J.C., 2004, "Measuring knowledge assets – Implications of the knowledge economy of performance measurement", *Measuring Business Excellence* Vol.8 Issue 1, p: 18-21.

<sup>27</sup> Ermine J.L., *La gestion des connaissances*, Hermès Science Publications.

<sup>28</sup> Vidal P., Planeix P. (sous la direction de), (2005) *Systèmes d'information organisationnels*, Pearson Education.

- l'archivage des données qui répond à un environnement légal pour assurer une traçabilité des opérations pendant 5 ans,
- la communication qui demande aux intermédiaires financiers de préciser à leur client le mode et le lieu d'exécution des ordres et, à cette fin, de revoir leur flux d'informations (*workflow*).

Les banques ont progressivement orienté leur stratégie vers le client et aujourd'hui la classification de leur clientèle requiert une gestion des connaissances qui leur permettra de garantir une satisfaction des clients avec une réactivité de plus en plus forte aux évolutions de marché, de les fidéliser et de créer de nouveaux services ou produits spécialisés. Car lorsqu'on aborde la communication sous sa forme interculturelle, au-delà d'une langue commune, les parties qui communiquent se doivent d'avoir une idée de l'histoire, de la culture, des lois et des pratiques de gestion, de leurs interlocuteurs pour limiter les obstacles<sup>29</sup>.

Le savoir est une ressource qui s'inscrit comme un avantage concurrentiel durable s'il n'existe pas de ressources de valeur équivalente elle-même imitable. C'est le principe de substituabilité développé par Barney<sup>30</sup>. Les banques ne doivent plus se focaliser sur l'obtention d'une ressource rare, difficilement substituable et imitable, elles doivent se concentrer sur une capacité organisationnelle distinctive<sup>31</sup>. Elles doivent partager et traiter la connaissance comme un processus et non comme un capital<sup>32</sup>. Lefebvre et al.<sup>33</sup> illustrent ce point de vue en abordant la connaissance comme étant davantage ce que font les collaborateurs que ce qu'ils possèdent.

Dès lors, la gestion des connaissances entre dans les outils stratégiques des banques.

Foray & Gault<sup>34</sup> et Reix<sup>35</sup> définissent la gestion des connaissances comme une pratique intentionnelle et systématique utilisée pour acquérir, saisir, partager et exploiter des savoirs productifs où qu'ils se trouvent, afin d'améliorer l'apprentissage et les performances au sein d'une organisation.

La banque performante et compétitive est celle qui sait produire et utiliser les connaissances dont elle a besoin pour générer du produit net bancaire.

La gestion des connaissances vient en amont du système de production. Nous reprenons ci-après le schéma élaboré par Ermine<sup>36</sup> :

<sup>29</sup> Pesqueux Y. (2004), *L'entreprise multiculturelle*, L'Harmattan.

<sup>30</sup> Barney J. (1991), Firm resources and sustained competitive advantage, *Journal of Management*, vol. 17 Nber 1, March, p. 99-120

<sup>31</sup> Grant R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, vol. 17, Winter, p. 109-122.

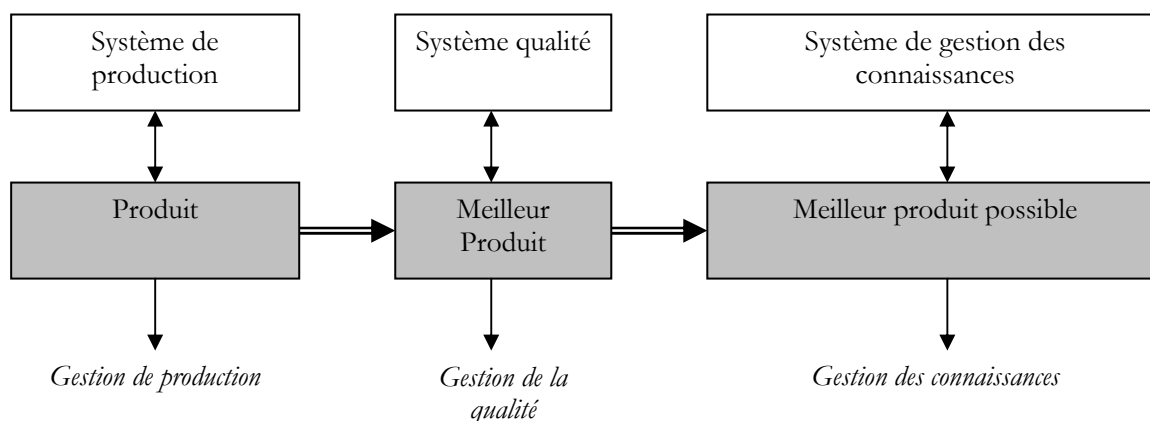
<sup>32</sup> Pallas V., Labaki R. « La gestion des connaissances : un processus stratégique pour la banque », in Lamarque E. (coordonnée par), *Management de la banque*, Pearson Education 2005.

<sup>33</sup> Lefebvre P., Roos P., Sardas J.C. (2003), « Gestion des compétences, gestion des connaissances et enjeux identitaires en conception : pour une approche unifiée de la dynamique métier », in Guénette A.M., Rossi M.

<sup>34</sup> Foray D., Gault F (2004), « Mesure des pratiques de gestion des connaissances, OCDE, Gestion des connaissances : mesurer la gestion des connaissances dans le secteur commercial », OCDE / Ministère de l'industrie Canada, p. 11-29.

<sup>35</sup> Reix R. (2004), *Systèmes d'information et management des organisations* 5ème édition, Vuibert.

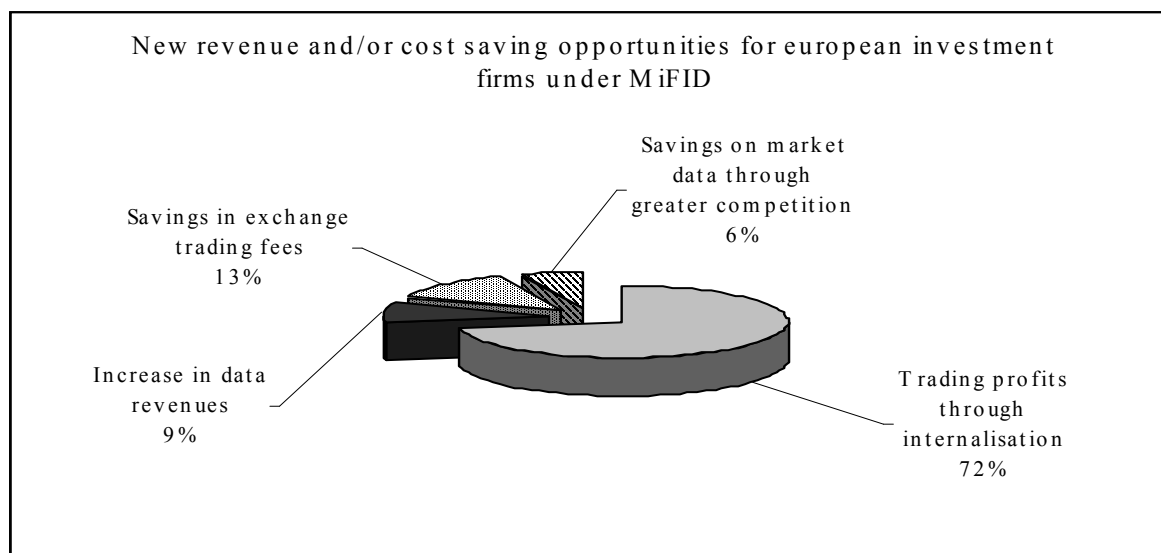
<sup>36</sup> Ermine L. (2000), « Enjeux, démarches et processus de la gestion des connaissances », <http://www.irit.fr/IC2000/ACTES/ErmineIC00.pdf>



La classification de la clientèle requise par la Mifid s'inscrit directement dans ce processus. Un PSI propose un produit financier à son client *via* le réseau, après une étude qualitative et quantitative du profil dudit client. Ensuite, la transparence est à assurer et les conditions d'exécution sont à conserver pour assurer la traçabilité des transactions.

### 3.2. Des coûts d'adaptation importants pour générer à terme des réductions de coûts pour les clients

Au total, le coût d'adaptation des intermédiaires de la place parisienne est évalué à 1,15 milliards € (les négociateurs effectuant des transactions pour compte propre devront s'adapter pour un coût compris entre 20 et 100 millions €).



Si le coût d'adaptation est, à ce jour, évalué à 1 milliard €, les économies sont attendues à hauteur de 1,6 milliard €.

A terme, les coûts de transaction baisseraient grâce à la concurrence accrue entre les prestataires, c'est là l'objectif de la directive européenne. Cependant, le coût de traitement post-bourse pourrait, quant à lui, augmenter, parce qu'il n'y a de centralisation prévue dans le domaine du règlement –

livraison et les informations post trade à publier augmente considérablement. C'est là la limite de la Mifid.

La Mifid s'inscrit comme l'une des 4 réformes majeures du secteur financier, au côté du ratio McDonough pour les banques, à envergure mondiale, du Solvency II pour les assurances et du Sepa pour les banques, à envergure européenne. En 2006, les établissements financiers ont totalisé 20% de la dépense informatique française, à hauteur de 9,4 milliards € (dont les 2/3 pour les banques).

L'obligation de conserver l'historique pendant 5 ans représenterait une augmentation de 400 % des volumes à stocker pour certains outils de transactions. Et au-delà de ce stockage, la classification clients, la mise à jour et l'archivage des dossiers requerraient des ressources tout aussi importantes<sup>37</sup>.

Au cœur de la Mifid, la *best execution* et la stratégie d'un établissement qui y satisfait de lui-même requiert des statistiques très lourdes obtenues et gérées par la TCA – Transaction Cost Analysis, générant de nouveaux applicatifs dans les systèmes d'informations.

La connaissance et la protection des clients requises par la Mifid requièrent une adaptation des systèmes d'information pour initialiser une base de données clients et la mettre à jour en permanence en fonction du comportement et du patrimoine du client.

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<sup>37</sup> Bousser J.E. (2007), « Une mise en conformité à coûts raisonnables », *L'Agefi Hebdo*, 25 – 31 octobre.