

# How next time to save banks without taxpayers' money: the case for COERCs

by

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## 1. Introduction

Rescuing banks with taxpayer's money creates a lot of controversy. To wit, the large popular outcry against bankers' bonuses paid after the rescued banks start making money again. Moreover, it encourages debt-holders not to worry about excessive risk-taking by banks as they will be bailed out by the government anyway.

Nevertheless, most governments hang on to the "too big to fail" doctrine which states that large institutions should not be allowed to fail because of the negative systemic effects as a result of counter-party risk as well as psychological effect such as bank runs. As a result regulators try to avoid having to bail out depositors by imposing capital requirements, at least to institutions that have secured deposits, or by putting restrictions on risk taking. The problem with these regulatory initiatives is that they are often contradictory and driven by populism. For example, during the third week of January 2010 the Obama administration announced it plans to prevent banks from investing in risky but profitable activities such as proprietary trading, hedge funds and private equity. In the two days after the announcement bank stock prices fell significantly, lowering their (market based) capital ratios. The lowering of their business risk lowered their expected profitability and hence increased their financial risk. Considering that there is actually substantial uncertainty about this legislation, the actual damage to banks' balance sheets will be much larger. Other measures such as special taxes on banks, while popular, go against the objective of increasing banks capital as well. In short, it is likely that regulation will be driven by politics and not in the interests of promoting financial stability and economic growth.

Moreover, increasing capital requirements in good times as well as bad times creates agency problems as pointed out by Kashyap, Rajan and Stein (2008)<sup>1</sup>: firms with too much equity in good times will tend to waste in negative NPV projects (including projects that may lead to payout of the much criticised bonuses).

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<sup>1</sup> A Kasyap, R.G.Rajan and J. Stein. "Rethinking capital regulations", working paper, NBER, 2008

Alternatively, the risk of default as well as the costs of financial distress can be reduced by having banks (or any corporation in general) issue contingent capital, in particular reverse convertibles. A reverse convertible is a type of subordinated debt that automatically converts into equity when some pre-specified level of financial distress is reached. This means that investors lower the leverage of the firm when it appears that the firm indeed should have less debt in its capital structure, i.e. in bad times, but not in good times. Simple conversion means that no cash is injected, only a swap of debt-for-equity. If conversion is agreed upon a well specified trigger in advance, the swap does not have to be negotiated, which should make the recapitalization process much smoother. As Duffie (2009) points out, debt renegotiation where creditors are asked to voluntarily exchange risky debt for equity suffers from the classic holdout problem where each individual creditor has an incentive to hold out, although creditors would be better off as a group to accept the restructuring proposal.

Interest in such securities has been made stronger after the observation that:

“In the recent crisis existing subordinated debt and hybrid capital largely failed in its original objective of bearing losses”<sup>2</sup>

The fact is that, in order to avoid systemic risk, in the recent financial crisis governments have bailed out subordinated debt holders (such as insurance companies). Second, because of legal complexity and reputation concerns banks did not force the debt holders into default.

Of course, the argument that bondholders should have taken more losses ignores the fact that if subordinated debt holders had expected to incur large losses in case of a financial crisis, they would have asked higher interest rates. So, it is not obvious that banks or other companies would be interested in issuing such securities, unless if they are forced by regulators. The problem with such “forced” investment as well as other regulation

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<sup>2</sup> “Risk, Reward and Responsibility : The Financial Sector and Society” (2009), Her Majesty’s Treasury.

that is against the interests of the shareholders is that it will create incentives for companies to spend resources to get around the regulation.

In this paper we propose an alternative approach. We propose that banks and other companies who are concerned about the costs of financial distress issue a new security which we baptize COERC: a Call Option Enhanced Reverse Convertible. The whole idea is to get around the debt overhang problem first pointed out by Myers (1977)<sup>3</sup> in his seminal paper on agency costs of debt. When debt is risky, equity holders may refuse to reduce financial risk by putting up new capital when the benefit to debt is larger than the total increase in firm value. Moreover equity issues are generally perceived by financial markets as negative signals, and investors may be reluctant to buy shares if they believe the issuer is trying to issue overvalued stock. Duffie (2009)<sup>4</sup> points out that this adverse selection problem can be avoided by issuing deep-discount rights issues, as in this case there is no distinction between new and old equity holders (provided every investor exercises his/her right). However, because of the debt overhang problem, managers who act in the interest of the shareholders may not be interested in such a deep discount rights offering. Hence Duffie proposes that because of social costs or systemic risk, the regulators should force companies to make a deep discount rights issue when a certain level of financial distress is reached. A similar forced equity issue is proposed by Hart and Zingales (2009)<sup>5</sup> who propose that whenever CDS prices reach a certain level, the regulators should force the company to issue equity. If they refuse, the regulator would take over.

The COERC provides an alternative form of coercion, but is not enforced by a regulator, but by the fear of dilution. Specifically the security will force the company to issue equity at a discount to bond holders whenever the company is in financial distress. The trigger that indicates financial distress should be based on market values. However, this dilution

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<sup>3</sup> Myers, Stewart, “Determinants of Corporate Borrowing”, *Journal of Financial Economics* 5, 1977. pp 147-175

<sup>4</sup> Duffie, Darrell : “Contractual methods for Out-of-Court Restructuring of Systemically Important Financial Institutions”, working paper, 2009

<sup>5</sup> Hart, Oliver and Luigi Zingales: “How to avoid a New Financial Crisis”, working paper, 2009

can be undone by equity holders if they repay the debt. This in turn will reduce the risk to the debt holders and make the COERC more marketable than traditional reverse convertibles proposed by others. It also keeps regulators away from the decision process. This will make the instrument more acceptable by managers, as, unlike arrangements imposed by regulator, it is not designed to maximize bondholder value, but to maximize shareholder value. Regulators (rightly or wrongly) ignore the company benefits of debt financing (such as tax savings and reduced agency costs of equity), and the costs of forcing equity holders to issue shares when their shares are undervalued<sup>6</sup>. Our proposal is therefore more consistent with a free market solution to the general problem that debt overhang discourages firms from recapitalizing when they are in financial distress.

## **2. Reverse convertibles in the academic literature**

In the academic literature two major proposals have been made. One by Raviv (2004)<sup>7</sup> where he proposes that debt will be converted into equity whenever the bank's capital ratio falls below a certain threshold.

Such an issue (called Enhanced Capital Notes, ECNs) was launched for the first time in the UK by Lloyds Banking Group in 2009. The securities (which are classified as Lower Tier 2 Capital) are convertible into equity whenever the Core Tier 1 ratio falls below 5 %. Although the issue was well received by financial markets, it should be pointed out that this was an exchange offer. In return for giving up more senior securities, investors in the ECN receive an extra 1.5 % or 2 % additional coupon income. It is not obvious that other investors would have had an appetite for such investment.

There are basically two problems with the instrument. First, capital ratios are only calculated every quarter. Such a mechanism will not work in a situation where a bank's capital structure deteriorates rapidly. Second, there is an issue about the marketability of

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<sup>6</sup> Unless the shares are issued in a rights issue and all current shareholders exercise their rights.

<sup>7</sup> Alon Raviv, "Bank Stability and Market Discipline: Debt-for-Equity Swap versus Subordinated Notes", working paper, 2004

such an instrument. Unlike a normal convertible, bondholders are forced to become equity holders when the company runs into trouble (that's why the securities are called reverse convertibles). It is true that, because of limited liability of equity holders, every risky bond can be considered as a risk-free bond plus a short put option<sup>8</sup>. However, here the put option will be exercised not in the event of bankruptcy, but in the event of financial distress. This does not seem to be an ideal instrument for the typical fixed income investor. The demand for securities may be so limited that issuing these securities on a large scale may become very expensive.

Another academic proposal was made by made by Flannery (2005, 2009a, 2009b)<sup>9</sup>, who advocates issuing so called Contingent Capital Certificates. Flannery first made this proposal in a working paper in 2002. His idea is similar to Raviv (2004) but now conversion takes place when the stock price hits a certain level, i.e. when the market value of equity over the book value of debt falls below a certain level. This market price is also the conversion price. The major problem with this idea is that it assumes that the market is efficient, i.e. there is no stock price manipulation or irrational panic. Such manipulation may lead to an unjustified transfer of wealth from shareholders to bondholders. The best way to illustrate this is with a numerical example.

Assume a highly levered company (bank) has assets of € 1000, secured debt of € 900, contingent convertibles of € 30 and common stock of € 70. Assume currently all assets and liabilities trade at book values and that there are 7 shares outstanding so that the stock

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<sup>8</sup> Indeed at maturity the value  $D$  of a zero-coupon bond with a face value of  $F$  will be the minimum of  $F$  and the value of the firm's total assets,  $V$ . In other words if  $V < F$ , the company defaults and the debt holders take over the company, so  $D = V$ . When  $V > F$ ,  $D = F$ . This is exactly the same payoff as an investor who owns a risk-less bond with face value  $F$  and has written a put option on  $V$  with an exercise price equal to  $F$ . So  $D = F - \text{Put}(V, F)$ . This shows that shareholders can hurt bondholders by increasing the value of the put option in two ways: by underinvestment (which lowers  $V$ ) or by excessive risk taking (which increases the volatility).

<sup>9</sup> Flannery, Mark, "No pain, no gain ? Effecting Market Discipline via Reverse Convertible Debentures", Chapter 5 of Hal S. Scott ed. Adequacy Beyond Basel : Banking Securities and Insurance, Oxford: Oxford University Press.

Flannery, Mark, "Contingent Tools can Fill Capital Gaps", American Banker, 2009a, Vol 174, Issue 117  
Flannery, Mark "Stabilizing Large Financial Institutions with Contingent Capital Certificates", Working Paper, University of Florida.

price is € 10. Assume also that the convertibles convert when the stock falls to € 5 and the conversion price is also € 5.

Suppose there is some unjustified panic which makes stock prices fall to € 5 per share, or the market value of equity drops to € 35. Convertibles will convert into 6 shares of common stock, so that the total number of shares increases to 13. However, if all parties understand that the true value of the assets is still € 1,000 then they know that the combined value of bondholders and equity holders stake is € 100, which means  $\frac{€ 100}{13} = € 7.69$  per share.

The gain to the bondholders is now  $€ 7.69 * 6 - 30 = € 16.15$  or a gain of 54 % relative to the market value of € 30 before the conversion. This gain, of course, comes at the expense of shareholders who now own 7 shares trading at € 7.69 rather than € 10, a loss of € 16.15.

Note that bondholders have a large incentive here to manipulate stock prices downward through false rumours or through shorting the stock. Moreover, because the short-seller can cover his short position by shares provided by the issuer after conversion, he is in an ideal position as he can cover his short without buying pressure. Note that the bonds can also be used to facilitate a hostile takeover bid without paying a control premium.

In a paper with Pierre Hillion<sup>10</sup>, we find that companies who issue mandatory convertibles tend to experience massive stock price declines in the year after the issue. Flannery (2009b) points out that many of the companies in the Hillion-Vermaelen sample are small stocks and therefore this problem is less relevant for large financial institutions. However, considering the firepower of some large hedge funds, it is not obvious that some banks would not become the target of such funds. Note that, as the recent financial crisis illustrates, panic can bring stock prices of large financial institutions down very fast, so the so called “death spiral effect” is not simply the result of short sellers.

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<sup>10</sup> Pierre Hillion and Theo Vermaelen, “Death Spiral Convertibles”, Journal of Financial Economics, 2004

Admittedly, the term “death” spiral is somewhat misplaced: companies don’t die as a result of the dilution. Wealth is simply transferred from shareholders to bondholders and one could argue that the regulator should not care about this distribution. However, if managers care about maximizing shareholder value (in particular, when they are shareholders themselves) they will be reluctant to issue an instrument that puts the stockholders at risk of massive dilution.

### **3. An alternative proposal: call option enhanced reverse convertible (COERC)**

In this paper, we would like to propose an alternative structure that gets rid of the threat of a massive wealth transfer to bondholders, as well as an instrument to deal with the second problem: how to make sure that most of the time bondholders will get their money back and don’t have to become shareholders, except in extreme circumstances. The latter element is important if you want to have enough marketability of the instrument.

The trick consists of separating the conversion price from the default trigger price, i.e, we want to set the conversion price significantly below the trigger price. Second, we want to give the shareholders a right (warrant) to buy the shares back from the convertible holders after conversion at this same low conversion price.

The call option solves problem number one: shareholders will no longer become the victim of unfounded manipulation or rumours. The fact that the conversion price is set significantly below the trigger price will give a strong incentive for shareholders to exercise the call option and repay the debt. This will in turn reduce the risk of the debt and therefore its marketability with fixed income investors.

A numerical example will hopefully clarify this.

Suppose that the default trigger price is € 5 and the conversion price is € 1. Suppose now the stock price gets manipulated down to € 5 and convertible bondholders convert their €

30 bond into 30 new shares. The new number of shares outstanding is now 37, which translates into a true (non-manipulated) fair value of  $\text{€ } 100/37 = \text{€ } 2.70$ . Obviously, considering that shareholders have the right to buy back these shares at  $\text{€ } 1$  per share, they will do so. If they did not, their wealth would fall from  $\text{€ } 7 * 10 = \text{€ } 70$  to  $\text{€ } 7 * 2.70 = \text{€ } 18.92$  a loss of  $\text{€ } 51.08$ . They can recover this loss on their old shares by buying back the 30 shares at  $\text{€ } 1$  from the bondholders (which, at a fair value of 2.70, represents a gain of  $\text{€ } 51$ .)

Suppose instead there was *justified*, true financial distress making the stock price fall to  $\text{€ } 5$  per share (implying a fall in market value of equity from  $\text{€ } 70$  to  $\text{€ } 35$ ). Bondholders will convert into 30 shares. The fully diluted value per share is now  $65 (=30+35) / 37 = \text{€ } 1.76$  per share. The shareholder will exercise his option to buy the shares back at  $\text{€ } 1$  so that the debt is again repaid.

It can be shown that the equity holders will always repay the debt until the fully diluted stock price is equal to  $\text{€ } 1$ . This will be the case when the combined value of the convertible and the common stock is equal to  $\text{€ } 37$ . As the debt is repaid at  $\text{€ } 30$ , the equity will be worth  $\text{€ } 7$ . Note that at this point the total value of the assets will be  $\text{€ } 937$ . In other words, *as long as the total value of the firm remains above  $\text{€ } 937$ , the debt will be repaid.*

Now, it is easier to understand why we want to set the conversion price significantly below the default trigger price. If, for example, we had set both prices at  $\text{€ } 5$ , the equity holders will not repay the debt if the fully diluted stock price is less than  $\text{€ } 5$ . When the conversion price is  $\text{€ } 5$ , there will be 6 new shares issued, or 13 shares outstanding. The combined value of both securities (assuming repayment of the debt after conversion) will be again  $\text{€ } 65$ , leading to a fully diluted stock price of  $\text{€ } 5$ . Note that at this point in time, the total asset value will be  $\text{€ } 900 + 65 = \text{€ } 965$ . Note that if the asset value falls below  $\text{€ } 965$  the shareholders will no longer exercise their option and the excess value of the total firm above the senior debt will now have to be shared between bondholders and shareholders.

So with the € 1 conversion price, bondholders will become shareholders when the value falls below € 937. With the € 5 conversion price they will become equity holders if firm value falls below € 965. So by lowering the conversion price we clearly have reduced the riskiness of the convertible debt, which should make it more appealing (marketable) to fixed income investors.

#### 4. Graphic illustration

Figure 1 illustrates our analysis. It shows the payoffs of the debt (with nominal value of 30) and the payoffs to equity holders at maturity of the debt, in function of total firm value. Note that because the firm has 900 senior debt, all other claims become worthless if firm value falls below 900. The solid line shows the payoffs when debt is not convertible, while the interrupted line shows the case of COERCs.

If the debt was not convertible, the value of the debt  $D$  would be € 30 as long as the total firm value  $V$  is higher than € 930. If  $V$  falls below € 930, the subordinated debt holders would wipe out the equity holders and receive  $V - 900$ . Note that in this case we get the classic hockey stick graph for equity which will be equal to  $\max(V - 930, 0)$ . Hence, the equity holder does not care whether firm value is € 930 or € 920 or € 910... This is a result of limited liability which creates costs of financial distress: shareholders are no longer interested in maximizing *firm* value as increasing firm value may benefit bondholders at the expense of shareholders. In other words, because  $V = D + E$ , an increase in  $V$  (e.g. by investing in a positive net present value project, or refinancing the debt with a new equity issue) may actually lower  $E$  if it leads to a large increase in  $D$ .

If we make the debt mandatory convertible (with conversion price of € 1 whenever the stock price hits € 5 or whenever firm value falls below € 965) equity holders will exercise their call option, repay the debt as long as the fully diluted stock price is more than € 1 ,

or as long as total firm value is larger than € 937. So until that point, nothing changes compared to the case where the debt was not convertible.

However, when firm value falls below € 937, shareholders will throw in the towel and bondholders end up with  $30/37$  of  $(V - 900) < 30$ . Shareholders will get the residual  $7/37$  of  $(\text{firm value} - 900)$ . Note the fundamental change here: equity holders are now interested in preserving firm value between € 900 and € 930. This interest is a direct result of the fact that the subordinated bondholders have to share the value of the firm with the equity holders whenever the value of the firm is in the € 900-930 range. Note that this does not mean that equity investors are not interested in risk taking. But this risk taking may come at the expense of bondholders, but not at the expense of total firm value.

Note that by putting the conversion price very low (at € 1) bondholders' risk is not much higher than in the straight debt case. If we had put the conversion and trigger price at \$ 5, the shareholders would have refused to repay the debt when firm value falls below 965, not 937. In that case, the risk of the debt holders would have been higher. Graphically, the blue line in figure 1 would start going down when the asset value reaches 965.<sup>11</sup>

## 5. Valuation

Figure 1 shows that, at maturity of the COERC, its value will be the minimum of  $F$  and  $\alpha(V-900)$ , where  $\alpha$  is equal to the number of shares obtained by the bondholders after conversion ( $n_1$ ) divided by the total number of shares outstanding after the conversion ( $n_0 + n_1$ ). In our numerical example,  $n_0 = 7$  and  $n_1 = 30$ , so that  $\alpha = 81.1\%$ . Let's redefine  $V-900$  as  $V^*$ , i.e. the combined value owned by the COERC and the equity holders.

It is straightforward to show that  $\min(F, \alpha V^*) = F - \text{Max}(F - \alpha V^*, 0)$ . In words, the COERC is portfolio of a riskless bond and a short put. The put option allows the investor (the equity holders) to sell back a fraction of the firm,  $\alpha V$ , to the bondholders at an

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<sup>11</sup> Note that the graph is somewhat oversimplified: if the COERC debt is more risky than the normal debt the nominal value should be higher than 30. As the debt becomes more risky, the nominal (promised) value should increase.

exercise price of  $F$ . They equity holders will exercise the option when  $F > \alpha V$ , i.e. when the value of the firm owned by the bondholders after conversion is less than the face value of the debt.

Finding a closed form solution for the put is not straightforward as the put option is an American option conditional upon the stock price reaching the trigger price (€ 5). In other words, whenever the stock price hits the trigger price of € 5, the shareholders have an option to pay back the debt or give the bondholders  $\alpha V^*$ . The maturity of this option corresponds to the time it takes to complete a rights issue during which shareholders have the option to buy shares at € 1 per share. If rights issues take a month to complete, the option will only be exercised if the stock price falls from € 5 to € 1 in a month. While this seems a remote probability (a 80 % decline in the stock price in one month) it is not impossible in the middle of a financial crisis, considering the high leverage of the firm. So the risk premium bondholders have to be compensated for is essentially a compensation for extreme price declines in periods of financial distress. As we are not aware of any closed form solution for such an option, its value has to be determined by numerical methods.

Note that the value of this put option can be lowered by increasing the trigger price (€ 5) relative to the exercise price (€ 1). This raises the immediate question: how should the trigger be determined? If managers maximize shareholder value, the trigger should be set in such a way that, if leverage increases beyond the trigger capital structure, the value of the firm falls. If we assume that debt has a tax advantage and reduces agency costs of equity, but creates financial distress, theoretically the trigger leverage should be set so that the difference between (i) the present value of tax savings and agency costs of equity and (ii) the present value of the costs of financial distress are maximized. If on the other hand, the regulator sets the trigger, it is obvious that they would want to set the trigger higher as they are mainly concerned about financial distress. This in turn would lower the cost of the debt, but not necessarily maximize firm value.

## 6. Some caveats

1. In order for the conversion to take place at very low stock prices, common stock holders have to approve a significant increase in the number of authorised shares. Note that after the conversion, the number of shares (and stock price) can be restored through a reverse stock split.

2. As long as the fully diluted stock price is above € 1 in our example, the shares obtained by the bondholders after conversion are assumed to be sold to the equity holders at € 1 when they exercise their rights. In practice the shares obtained through conversion will not be issued to convertible investors until the rights issue is completed, i.e. several weeks later. Once the rights issue is completed the funds will be used to repay the debt. In other words, once the trigger generates conversion, the company has an option to deliver the shares or to repay the debt. By not issuing the shares to the bondholders, the firm avoids a private stock repurchase. In many countries the percentage of shares that can be repurchased is limited, which would prevent the large repurchase in our example. Other countries (e.g. Belgium) impose corporate taxes when companies buy back stock. Structuring the contract so that it does not involve a share buyback seems necessary to make it practical.

3. Although some may see this structure as a way to undermine the limited liability of shareholders, note that shareholders who feel that they don't want to put more money in the company can sell their rights to other investors who rationally will exercise the option. Note that if no-one exercises the call option, bondholders would realize a large windfall gain: in the case where the combined value of equity and debt falls to € 65 the bondholders would end up with  $30/37 = 81\%$  of this value or € 52.70, a massive profit of € 22.70 on an investment of € 30.

4. Throughout our analysis we have assumed that bankers want to maximize shareholder value. Kashyap, Rajan and Zingales (2008) point out that regulatory pressure to increase equity capital may create agency problems: equity gives managers a lot of discretion and

provides opportunities for them to destroy value in negative NPV projects. COERCs are in that respect superior to equity financing: as long as the bank's stock price stays above the trigger level, the security imposes the same discipline as a debt instrument. Capital is only provided in bad states of the world and it is used to repay debt, not to engage in negative NPV projects. After recapitalisation, the bank can reissue new COERCs to make sure that this pressure is restored. Kashyap, Rajan and Zingales propose that, rather than increasing capital requirements ex ante, companies buy contingent capital insurance, i.e. insurance that inserts capital in the bank when it gets into trouble. This essentially boils down to buying put options on your own stock. The difference with our proposal is that their solution requires the existence of default proof entities that sells such insurance. Their trigger mechanism is also not company-specific but is based on aggregate bank losses.

5. We have assumed here that conversion is driven by market prices, not by a regulator. We believe that this is important to take away regulatory risk as well as negative price impact that may result from a regulatory announcement. If the trigger is based on a pre-specified market value/book value of debt ratio then of course the trigger stock price will depend on the available information about book values of debt. Hence the quality of the trigger will depend on the quality of the accounting information. Hart and Zingales (2009) propose a trigger based on CDS prices. As this is a more pure market based variable than market equity/book value of debt such a trigger may well be better than a leverage ratio that is still partially based on book values. For example, if the CDS price of the bank's debt exceeds a certain threshold, the trigger price will be the market price of the stock at that time. The conversion price of the COERCs (and the issue price in the subsequent rights issue) will then be equal to 20 % of the market price.

6. While we do not suggest that regulators should force banks to issue COERCs, regulators should facilitate the issuance by considering the debt as very close to Tier 1 capital. Note that the Enhanced Capital Notes (ECN) issued by Lloyds Banking Group in 2009 are classified as Lower Tier 2 Capital. Note also that, in our numerical example we assumed that the secured debt, which can be interpreted as deposits, is safe. So, we still

need to have a system of deposit insurance to avoid bank runs created by panic. In no way, the COERC can be considered as the ultimate instrument to save the world from financial collapse.

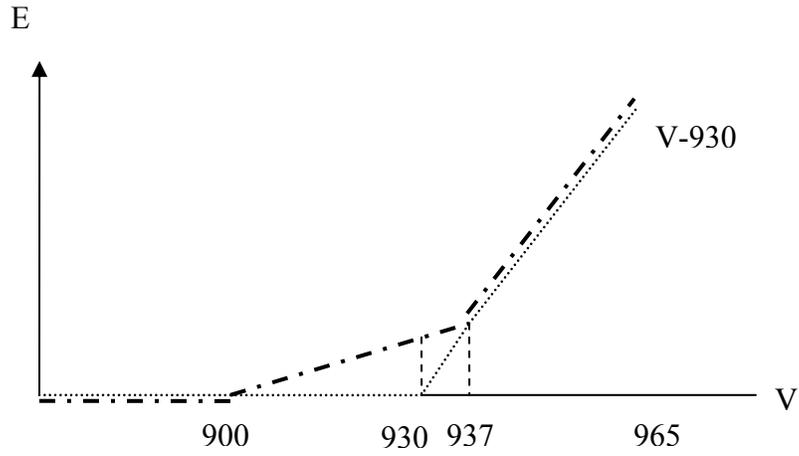
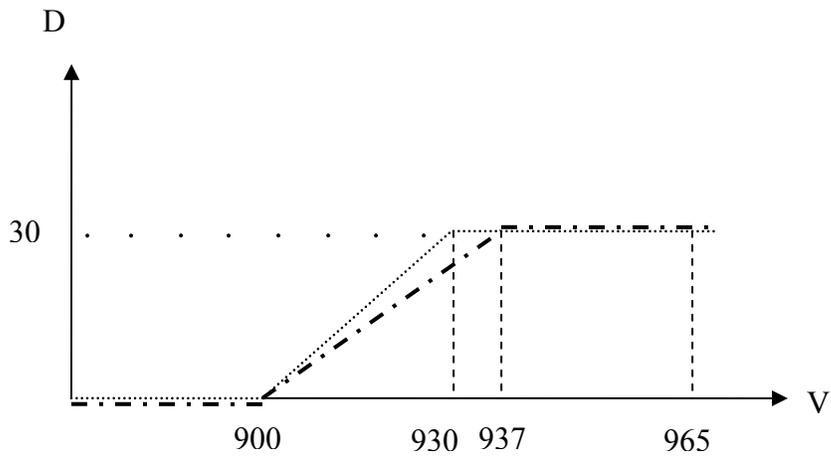
7. The conversion of debt into equity does not bring in new capital, it simply “cleans up” the balance sheet by eliminating the debt overhang problem. So the conversion does nothing for the cash position of the bank, so it appears it does not address liquidity crises. However, if the COERC eliminates the debt overhang, there is no reason why the bank cannot issue additional equity (beyond the amount necessary to repay the debt) or new COERCs. The debt overhang is the main reason why firms cannot raise new risky capital when they are in financial distress. Once this overhang is gone, there should be no reason why the bank could not obtain additional liquidity.

## **7. Summary**

In this paper we propose a new security, the Call Option Enhanced Reverse Convertible (COERC) in order to reduce the probability of default and hence the associated costs of financial distress. The security design is a modification of the proposal of Flannery (2005, 2009) to deal with two fundamental issues. First, the security should not be an instrument to manipulate the stock price or put the stock in a “death spiral” tailspin because of fear of massive dilution. This is avoided by giving the shareholders a warrant to buy back the shares from the bondholders at the conversion price. Second, one cannot expect that there will be a very active market if bondholders are exposed to massive risks. One way to reduce the risks for the bondholders is to design the security in such a way that it forces equity holders to pay them back when financial distress becomes significant. This is achieved by setting the conversion price very low, below the stock price that will trigger the conversion. Not paying back the debt holders will result in massive shareholder dilution and a large wealth transfer to the debt holders. This in turn will lower the risk of the debt.

Our design deals with the fundamental problem of high leverage: because of the limited liability of equity, firms will tend to refuse to restructure their capital structure, even when it is in the interest of total firm value maximization. Although we had bank problems in mind, we argue that the security could be useful for corporations in general, to lower their costs of financial distress.

Figure 1 : COERC versus straight debt



..... Payoff diagrams to equity holders and bondholders when debt is not convertible.

- . - Payoff to equity holders and bondholders when debt is convertible

D = Subordinated Debt; E = Equity; V = Total firm value