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Executive compensation based on asset values

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Abstract

This paper describes how credit default swaps could be employed to create performance based executive compensation portfolios that reflect the value of a firm's debt as well as equity; i.e. the total value of all a firm's assets. We define so-called Asset Value Unit (AVU) compensation portfolios that work both for executive- and non-executive pay schemes in financial as well as non-financial firms.

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1. Introduction

We suggest a method of structuring performance based executive compensation that reflects the performance of debt as well as equity. More exactly we suggest paying executives with portfolios made up of credit default swaps (CDS) as well as stocks. We call these (long-term incentive) compensation portfolios Asset Value Units (AVU) and the idea is to link the level of compensation more closely to the firm's asset value rather than to its equity value. The method works for financial as well as non-financial firms but the introduction of debt elements in managers' compensation schemes is particularly important in highly leveraged firms, such as banks, where the executives otherwise have a strong incentive to increase the risk of the firm on behalf of its debtholders.

The idea that managers could be paid with debt in addition to equity is not entirely new. Jensen and Meckling (1976) discussed the idea in their early paper on firm ownership structure and it has recently been acknowledged in Bolton *et al.* (2010). Except for certain pension plans with debt-like characteristics the idea has never been widely accepted in practice, however. Consequently, today all-equity compensation (not counting salary, defined benefit pensions and other benefits) is the norm in long-term incentive compensation plans all over the world. One reason for this is that corporate debt often is not traded and therefore difficult to price correctly. Now, with the advent of the credit default swap market this is gradually changing and today many firms have traded credit default swaps.

Our suggestion is that credit default swaps are used to price hypothetical zero-coupon bonds and that these bonds are then packaged together with common equity into portfolios, that we call Asset Value Units (AVU). The value dynamics of the Asset Value Unit is closely linked to the asset value dynamics of the firm since the proportion of debt and equity in the AVU is chosen to equal the leverage ratio of the firm. Furthermore, by using as long CDS maturities as possible, the AVUs introduce incentives for the executives to care about the long-term interests of all stakeholders to the firm and not only the short-term interests of shareholders. In the particular case of banks, this would be a very much welcomed development not only for the bondholders but also for the tax-payers standing behind national deposit insurance schemes and too-big-to-fail bail out policies. And since banks are already regulated by the government an additional layer of regulation, if needed, covering the compulsory inclusion of debt elements in compensation schemes should be fairly non-controversial.

The idea of using credit default swaps in executive compensation was first raised by Bolton *et al.* (2010). Their actual implementation of the idea differs somewhat from the one suggested in this paper, however. Most importantly, while Bolton *et al.* (2010) suggest that the difference between the firm's CDS spread and some weighted industry "benchmark" spread should be used as one component in a *linear incentive contract* of CDS and equity we find it much more intuitive to compute hypothetical bond prices implied by the CDS spread and combine these bonds with stocks into so-called *Asset Value Units*. In that way no benchmark is needed and no incentive contract "loadings" have to be estimated (we simply use the leverage ratio of the firm). Interestingly, in an experiment resembling our suggested asset-value based executive compensation scheme, American International Group Inc., the insurance company bailed out by the U.S. government, has decided to pay executives in units of 80% junior debt and 20% common stock. The plan was made public on May 24, 2010 and is aimed at retaining executives in the firm (Son 2010). While no use of credit default swaps is mentioned in the plan, and while the proportions of debt and equity do not seem to be explicitly based on the leverage ratio of AIG, the plan otherwise resembles the one suggested in this paper.

2. The Asset Value Unit (AVU)

In the typical firm of today, a substantial share of CEO or executive compensation is tied up to equity in the firm. In the US, for instance, over the time-period 1995-2008 the proportion of the total CEO compensation that was paid in equity was above 50%, both in the non-financial sector and in the financial sector (Balachandran *et al.* 2010). The reason for the extensive use of equity-based pay is to align the objectives of the CEO with those of the shareholders. However, while equity is commonplace in executive pay-packages, debt is not. This is rather curious since most firms are financed with debt as well as equity. Consequently, debt should be included in executives' compensation schemes to serve the interests of stakeholders in the firm other than shareholders, most notably debtholders. Such a scheme would discourage excess risk-taking and leverage. In addition, such a compensation mechanism is self-correcting; in a firm that struggles, the value of equity falls and the debt (whose value most likely falls less) makes up a larger share of the total executive compensation. This then automatically leads to the CEO being more risk-averse exactly when debt holders expect him/her to be more prudent.

As discussed above, in this paper we combine debt and equity of the firm into a portfolio that we call an Asset Value Unit (AVU) since its value mimics the asset value of the firm. The debt value is calculated using the spread of a long-term maturity credit default swap (CDS) with the firm as the reference entity. This credit spread is supposed to be an indicator of the credit risk of the debt and the higher the spread the higher the risk. We suggest that the longest possible CDS maturity, i.e. 10 years, should be used. The risk-free rate of interest, r_f , is also needed and we suggest that the value of the AVU should be calculated using a constant risk-free rate over the entire vesting period. In this way the CEO compensation is not affected by events (economy-wide interest rate movements) beyond the CEO's control. The value/price, P_D , of the debt portion of the compensation package is then calculated, on a daily basis, as

$$P_D = \frac{N}{(1 + r_f + s)^T} \quad (1)$$

where r_f is the T -year "risk-free" rate of interest and s is the spread of a T -year CDS contract. The nominal amount, N , is chosen by the company board and trivially depends on the size of the equity compensation. The value/price, P_E , of the equity portion of the compensation package is observed in the stock market on a daily basis (the stock price times the number of stocks granted to the CEO) and the value of the Asset Value Unit (AVU) is consequently

$$AVU = \frac{Debt}{Debt + Equity} \cdot P_D + \frac{Equity}{Debt + Equity} \cdot P_E \quad (2)$$

since the debt and equity proportions, respectively, in the AVU are determined by the leverage ratio of the firm. In this way debt and equity contribute to the *initial* value of the Asset Value Unit in proportions identical to the initial leverage ratio of the firm (initially, P_D is set equal to P_E). The exact details of how the payment contract is implemented, including the choice of vesting period etc., is not discussed here.

The use of credit default swaps in structuring executive compensation packages, instead of corporate bonds or loans, has several advantages. For one thing, the effect of movements in the risk-free rate of interest is efficiently isolated from the compensation calculation. Moreover, if the CEO were to be paid in bonds the firm might be required to issue more debt. This seems misplaced and there is no such need when CDS are used to price hypothetical bonds in the way described above. Since CDS prices often seem to drive bond prices, analysts' calls and rating agency actions (see for instance Hull *et al.* 2004) the effect of external factors such as rating changes not controlled by the CEO can also be avoided. Finally, compared to corporate loans and

bonds, credit default swaps are typically more liquid and therefore likely to be more efficiently priced in the market.

3. Barclays Bank

As an example we look at a large global financial services firm, i.e. Barclays. The main reason for choosing a bank is the high leverage levels in the banking sector and the associated agency problems (John and John 1993). In Fig. 1 the asset value performance of the bank is compared to the bank's equity value performance over the time period July 1, 2004 to November 25, 2011. The stock market-, (10-year senior) credit default swap- and (10-year UK Govt.) interest rate data is downloaded from Datastream and the leverage ratio is downloaded from annual reports.

The long-term movements in the value of the compensation portfolio based on AVUs are obviously much smaller than those of the compensation portfolio based on stocks. During the prelude to the crisis, a time-period where huge imbalances were built up in the banking sector, the stock-based portfolio rewarded the CEO of Barclays handsomely (a factor six better than the performance of the AVU-based portfolio) while during the worst of the crisis the relative performance of the stock-based portfolio is much less extreme (a factor three worse than the performance of the AVU-based portfolio). That is, during the crisis the value of the AVU-based compensation portfolio also falls drastically. In other words, it seems that tying executive compensation to asset values is more consistent with the executives' actual long-term contribution to their businesses (and possibly to society overall) than tying the compensation to equity valuations.

Furthermore, by paying the CEO with AVUs instead of with stocks one most likely ties the performance-based compensation harder to the actual performance of the bank and less to the general market developments. The peer-driven component of the compensation is most likely also reduced by tying the pay to the performance of two firm-specific securities (debt as well as equity) rather than to just one.

4. Conclusion

In this paper we have described how credit default swaps could be used to link executive pay to the value of a firm's assets instead of the value of its equity. So-called Asset Value Units (AVU) were defined and used to create asset-based compensation portfolios where the compensation levels most likely are tied harder to the actual long-term performance of the firm than if equity-based compensation portfolios are used.

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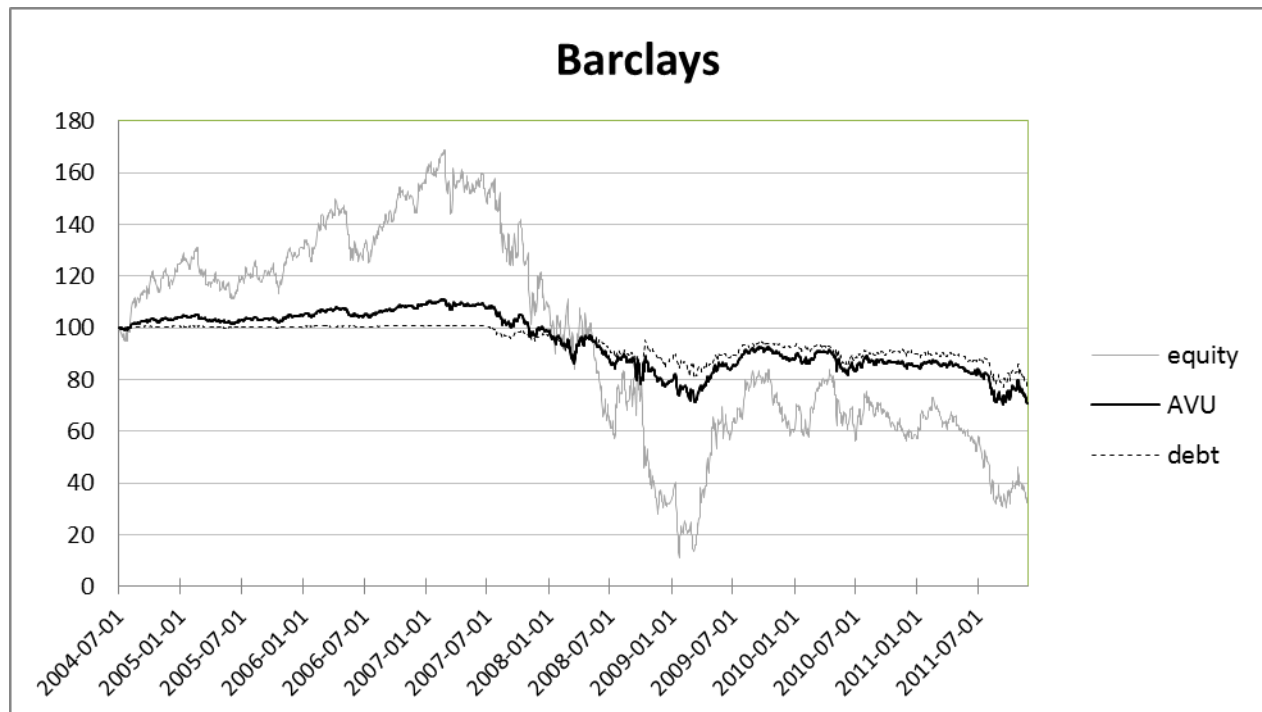


Fig. 1

Equity-, debt- and asset value (AVU) dynamics for Barclays from July 1, 2004 to November 25, 2011 (normalized to start at 100).