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COMPANY'S OPTIONAL FINANCING APPROACH

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Abstract: Financial title emission can be described in the terms of the optional assets for the forecasted value of the company. There is a fundamental status asymmetry between shareholders and creditors: shareholders can lose all the flows brought as capital but also can win potentially unlimited profits, while creditors retrieve more easily the amounts from the beginning of the contract.

Key words: financing, owner's equity, liabilities, put, call

Option theory is the basic for a new vision in company financing. Company's financing can be described and managed in options terms. There is no financing option that can't be perceived and appraised as optional operation upon the forecasted value of the of the company's assets.

Liabilities/owner's equity rating was used for a long time in company financing management. Today, the opposition between the two categories with different characteristics is not so well defined. It remains strong and must be known for a better understanding of the company financing innovations.

Owner's equity represents the basic source for company financing, being supplied through owner's contribution, partial or total reinvestment of the profits, and the amounts from amortization.

Owner's equity corresponds with the shares owner's. The shareholders are often presented as the company owners. **E. F. Famma [1980]** [1] considers that the company is nobody's propriety. Only production factors and economic resources are somebody's propriety. The company is not a production factor. The shareholder is the owner of a using and assignment right over the asset value of the company.

Liabilities can have different aspects. We will discuss here, the financial liabilities that imply the payment of amounts in form of interests. A financial liability differs according to reimbursement method; receivable rank (priority or subordinate title) or the warranty offered for the receivables. There are long term financial commitments, i.e. leasing contracts which even if they don't appear in the balance sheet, are considered financial liabilities and treated correspondingly.

1. Resources optional financing approach

Financial title emission can be described in the terms of the optional assets for the forecasted value of the company. Therefore, it is considered that shareholders are the holders of a buying option (CALL) over the asset value of the company. In case of indebted companies, shareholders hold and a selling option (PUT) over the same asset. Each time a company is indebted she creates an option. The company is forced to reimburse the liabilities at deadline. If the asset value of the company is smaller than the debt amount, she can choose not to pay and the bond holders will keep the company assets. Therefore, the one who offers the loan, effectively acquire the company and the shareholders get an further buying option through reimbursing the loan. So, if the company

1 E.F.Famma, *„Agency Problems and the Theory of the firm”*, Journal of Political Economy, vol 88, 1980

goes bankrupt shareholders benefit from a „joker"[2] way out that enable them to abandon the liabilities to the creditors. The importance of this fact is that all we know about buying option negotiation can be applied to company liabilities. This analogy was first time mentioned by **F. Black and M. Scholes [1973]**[3].

There is a fundamental status asymmetry between shareholders and creditors: shareholders can lose all the flows brought as capital but also can win potentially unlimited profits, while creditors retrieve more easily the amounts from the beginning of the contract.

In the following we will make a simplified analysis over the way a company is operating and we will describe investor's status. The analysis refers to a stock company where the economic asset value (V) is assigned between owner's equity and their value is CP and D. The company issued a single kind of loan (with zero coupon) reimbursable at deadline in unique aitch bone, that includes the indebted capital and the payable interest. We will consider that the debt amount is 100.

We have two possible situations at debt deadline:

- economic asset value (V=130) is bigger than liabilities value that must be reimbursed. In that case shareholders agree the liabilities reimbursement and they get the residual value (30);
- economic asset value is smaller than the liabilities amount (V=80). In that case shareholders take advantage of limited risk clause to contribution; they loose the whole amount and let the economic asset to creditors. Shareholders can't loose more than the initial amount that was given to the company, and creditors endure the difference between the economic asset value and the liabilities value.

This situation can be analyzed in option terms.

Shareholders own, from an economic prospective, a European buying option for the economic assets of the company with the following characteristics:

- **support asset** is company economic asset;
- **exercise price** is the loan value that must be reimbursed at deadline (100);
- **volatility** is equal with the support asset value volatility, namely the economic asset;
- **maturity** is equal with the liability deadline.

At deadline, shareholders can exert the buying option and reimburse the amount due to creditors or they can abandon the option.

Indebting the company means, from shareholders prospective, selling the economic assets of the company to the creditors, but keeping a buying option for the economic asset to a price equal to the debt amount that must be paid out at the deadline. The shares of an indebted company are used for buying options for the economic assets of the company.

From the creditors point of view this is similar with investing in an asset without risk and selling to the shareholders an European buying option over the company assets. Creditors can be in the situation of owning the economic asset if the company is not reimbursing his debts. Therefore instead of recovering the lent amounts they recover the company assets by "buying" it at the debt value that is not reimbursed.

European selling option has the following characteristics:

- **support asset** is company economic asset;
- **exercise price** is the loan value that must be reimbursed at deadline (100);

2 P. Vernimmen, „*Finance d'entreprise*", Ed. Dalloz, Paris, 2002, pag.692

3 F. Black&M. Scholes, „*The pricing of Options and Corporate Liabilities*", Journal of Political Economy,81,pag. 637-654

- **volatility** is equal with the support asset value volatility, namely the economic asset;
- **maturity** is equal with the liability deadline.

Selling the selling option assure the creditor a supplementary remuneration added to the risk-less interest rate for his total remuneration. This supplementary remuneration is legal because the creditors submit to the risk of exerting the selling option by the shareholders, which means the company will not comply with the commitments and will not reimburse the loan.

Option value is equal with the difference between the discounted value of the loan at the risk-less interest rate and the market value of the loan, respective the discounted value at a rate that includes the non-reimbursement risk (loan cost). That one is exactly the risk premium that covers the difference between a loan and a loan without risk.

Creditor is consent to award the company a loan of 103 to a interest rate without risk. Company can receive 103, but the loan value is not 103 but 100, once the flow is discontinued to a normal interest rate asked depends on the company's risk.

With the risk premium (credit risk price), the company buy from the company creditors a buying option over the economic asset. All over, the company received an amount equal to 100, the bank paid 100 and his liability is risky because he sold a selling option over the economic asset who the company can exert if at the debt deadline the economic asset value is smaller than the debt that must be reimbursed. Option exerting allows the company and the shareholders to pay the debt: instead they will abandon the economic asset to the creditors, which became the new owner (holders) of the company.

Lending the company means for creditors same thing with investing without risk (buying a risk-less asset) and selling the shareholders a selling option over the company asset with a price equal to the amount due.

At debt deadline we can have the following situations:

- if the debt value is smaller than the asset value, the buying option value is positive, selling option value is zero, then own equity's have a positive value and the following equation is true:
  buying option value
  = asset value
  - debt reimbursement value
- if the debt value is bigger than asset value, buying option value is zero, selling option is positive, than own equity have no value and the following equation is true:
  debt value
  = company asset value
  - selling option value

2. Defining the balance sheet with the help of option analysis

Optional analysis for financing leads us to the appraisal of the positions for those who invest in the company. It starts from the own capital value dependence and the debt value in choosing a financial structure and forecasting for the assets value. The appraisal of the risky debts shows an important contribution of the financing, given the fact that the risk for creditors is included in foretelling about company's asset value and the financing structure.

The core issue is expressing the existing relation between company asset value, own equity value and debts value.

Shaping option position does not necessarily imply the existence of the option; she can results from combining conditional type operation (buying option or selling option) with operation regarding the support asset (buying or selling support asset) or loan operation at interest rate without risk (taking or giving this kind of loans).

Shareholders and creditors optional situations accrue from equivalence relations that can be established starting from a set of combined assets. Thus, option can be formed anytime starting from a set of operation on the support asset, optional asset and loan operation at interest rate without risk. We will get shareholders and creditors by combining different options optional positions.

We are interested in two of these combinations in order to build the company's financial balance sheet in market value, starting from the forecasted balance sheet.

First example of combined operations that generate equivalent situations for an investor: holding a buying option for an asset and investing an equivalent amount with the actual value of the option exercise price at a interest rate without risk, respective holding a selling option on the support asset and owning the support asset. In booth situations we deal with decrease protection strategies.

Second example of combined operation consists in holding an selling option on the support asset and owning the support asset.

Independent from the future evolution of the share price, both investment strategies generates same results. Hence a basic relation for the European option:

Buying option value
+ exercise price actual value:
= share price + selling option price

This relation between share price, buying option value and exercise price actual value is called parity between buying option and selling option and was first time emphasis by F. Black and M. Scholes.

Equivalence relations for the positions allows knowing the answer for two questions: which is the premium value (selling option premium) that allows the investors blocking his results portfolio at the option exercise price and determine the buying option value that allows the investor to benefit from the asset value rising without owning it and without placement risk.

In the second example holding a buying option is equivalent with the following asset combination: owning the option support asset, achieving a loan equal to exercise price actual value negotiated for the buying option and buying a selling option with the same price and exercise date like the buying option.

Equivalence of the two situations in rising and decreasing the support asset value, make them negotiable at the same price. We can consider that:

buying option value
= support asset value
- loans exercise price actual value
+ selling option value

3. Optional representation of the company's balance sheet in market value

From the foregoing we can notice that shareholders wealth at deadline can vary from zero and the difference between asset value and debt value, accordingly to asset value at deadline.

Creditor’s wealth is between asset value and debt value.

At debts deadline we can have two situations: the asset value is bigger than reimbursement debt value or that one will be lesser than reimbursement debt value.

a) The asset value is bigger than reimbursement debt value

If at deadline the asset value is bigger than reimbursement debt value, the shareholder will put good use over asset value, will reimburse the loan and keep the supplementary value. For the shareholder is the same thing as owning a buying option for the asset value.

We have a first look in option terms on the shareholders-creditors report referring to anticipated repartition of the company's value. Thus, shareholders have decision power and control, deciding in choosing a financing plan or transferring to the creditors the company's asset. They receive an amount equal to the actual value, at the interest rate without risk for the reimbursement value of the debt. Moreover, they buy from creditors a buying option on the company's asset value at an exercise price equal to debt reimbursement value. Company's financing is secured by the capital brought by the creditors and that correspond to the discounted value at the interest rate without risk for the reimbursement value of the debt and the amount that represent the buying option price buyout from shareholders to creditors.

b) The asset value is lesser than reimbursement debt value;

If this situation happens at deadline, the shareholders renounce the creditor asset value. They will receive an amount equal to asset value. In this case everything is like the shareholders own a selling option bought from the creditors.

Thus we have a second view on the company, in complementarity's with the above, which allows us a more complete representation, in option terms of the company's balance sheet. This second opinion: everything happens as if the shareholder remains the asset owner and borrows the capital at the interest rate without risk and buys from the creditors a selling option on thee company's asset at a price equal with the reimbursement rate at the same deadline with the debt deadline.

For the same optional representation of company's finance the two approaches must be close by. Therefore we will use the equivalence relation that allows us the transformation of a buying option in selling option and vice versa.

Holding a buying option
+actual value of the exercise price
=owning the support asset
+holding a selling option

Accordingly to this relation holding a buying option and the actual value of the exercise price at the interest rate without risk is equivalent with holding the asset and a selling option on the asset at the same price and deadline. If the situations are equivalent they should be negotiated in the same conditions. Therefore the values of the two positions are equivalent. We will have:

buying option value on the company's asset
+ actual value of the debt at interest rate without risk
= company's asset value
+selling option value on the company's asset

This equation reflects the financial balance sheet of the company. Buying option value pond to own equity value, selling option value indicates the company's bankruptcy risk premium that can be asked by the creditors that finance the company. The debt without risk value decreased with the selling option value creates value for the risky debt. We can rewrite the previous equation:

Own equity value

+ debt without risk value
= company's asset value
+ company's bankruptcy risk premium value
or
Own equity value
+debt without risk value
- company's bankruptcy risk premium value
= company's asset value

If we change debt without risk value minus company's bankruptcy risk premium value (selling option value) with risky debt value balance sheet equation will be:

Own equity value
+ risky debt value
= company's asset value

If the selling option tend to zero, debt value tend to un-risky debt value. This fact can't be verified, only if the shareholder assumes the whole exploitation risk of the company, creditors borrow at interest rate without risk.

Defining the company's balance sheet in option terms allows clarifying the shareholders and creditors position at deadline. It also allows the appraisal of different financing structures and the settlement of negotiable conditions between shareholders and creditors in company's financing.

Shareholders and creditors need the position appraisal when they decide to deliver capital to the company. Shareholders want to evaluate buying option over the asset value, creditor's needs to determine selling option they want the sell to the shareholders or that characterized the situation at a certain point.

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