

Managing the Risk of Specific Projects an Innovative Model from the Italian Experience

Bruna Ecchia

Department of Economics and Statistics
University of Naples Federico II
Via Cinthia 26 Monte S. Angelo – 80 126 Napoli
Italy

Abstract

Based on the integrated standpoints of studies in managerial behaviour and the contributes of the options in the enterprise value creation this paper highlights how an original Italian technique of productive resources segregation can be a valid internal way to confine the impact of downside risk of specific and very innovative projects without in any way limiting the impact of upside risk. Only under an unrealistic hypothesis of a perfectly efficient market this technique has no effects. In all other cases it would be generally able to achieve both a lower risk threshold for accepting particular innovative projects and an increase in the market value of the company.

Keywords: Innovative project risk management, real call option, equity value

1. Introduction

The analysis carried out in this paper is set in the context of contributions to studies in matters of project selection and risk management. Based upon current hypotheses of sub-optimal behaviour in investment choices, the paper examines the case in which sub-optimal choices are made in project selection, due to an anomalous behaviour towards risk by both of managers and shareholders. The anomaly consists in excluding projects whose return's volatility is estimated above a certain "psychological" threshold of acceptability, thereby neglecting its expected yield. This behaviour arises from motivations that differ between managers and shareholders but that in any case entail the exclusion of many particularly innovative and hence more risky projects (Hull 2009).

Such behaviour substantially results in assimilating downside risk to loss when it exceeds a certain benchmark, thus leading to an irrational selection that tends to distance the firm from the frontier of innovation. In this way, progressive marginalization of the firm can take place: the more open the market is to competition, the faster such marginalization is likely to occur. Can such sub-optimal behaviour be eliminated or reduced? In what ways and with what techniques? And what effects would follow on the market value of the equity? What are the connections with the debt value (and with the behaviour of creditors)? How important is the condition of market efficiency?

The analysis conducted in this paper attempts to answer these questions by studying the effects of a new form of risk management, substantially based upon a novel instrument that Italian corporate reform law provided in 2003. This technique, while not limiting the risk on the upside or downside of the project itself, defines ex ante the amount of equity involved in the downside, since it creates a kind of "spin-in" that limits the impact of possible failure to a carefully restricted asset area of the firm, creating a protective barrier against negative impacts on the entire firm. Such protection serves to lower the acceptability threshold of new projects, so as to include innovative projects with a very high if very volatile expected return, and therefore captures some investment opportunities that would otherwise be rejected.

Thus the technique presented here seems to represent an original and valid response to those situations of decisional paralysis or rejection based on excessive risk aversion highlighted above. Furthermore, what seem to be more interesting from the shareholders' standpoint are not so much the innovative traits of the projects but the benefits in terms of equity value. Equity may be seen, from the standpoint of equity holders, as a call option on the firm's assets (Black-Scholes, 1973).

As a consequence, the portion of capital equivalent to the assets set aside for the project can be considered, from the firm's perspective, as a call option on this segregated part of the firm's assets. The aim of this paper is to ascertain whether this kind of "spin-in" can in itself contribute, and under what conditions, to increase the value of the equity as real call option. With regard to this aspect it may be noted that in investment selection studies, lack of strong integration between the outcomes of two fundamental approaches is not infrequent: that of Black and Scholes (and Merton), on the one hand, and that of Modigliani-Miller, on the other. Also the outcomes of behavioural finance are still often underestimated. Only if based on strong integration among these standpoints can the manner in which the call varies be appreciated as a result of the inclusion of a specific innovative project, structured autonomously and isolated from the rest of the firm.

From this line of thought it emerges that the technique in question has positive effects on the market value of shares but only when the market is not completely efficient. In more detail, the paper is structured as follows. The second section reviews this particular technique of project risk management and connections with the existing literature, highlighting the innovative contribution made by this paper. In the third section the analysis focuses on some examples of investment choice in which a lack of rationality is evident due to an *a priori* rejection of strongly innovative projects because of the high risk connected to them, whatever their expected return.

In this section the conditions are examined for the neutralization of this potentially intrinsic bias with positive effects both on firm innovations and equity value. The second of these effects is the core of the paper and it links the part of the capital equivalent to the assets set aside to the structure of a call option, which in turn assumes the features of a call option within the greater call option represented by the entire equity. The chances of this option affecting the value of the greater call option will primarily be considered in an abstract context of perfectly efficient markets and successively in the usual case of imperfect capital markets (characterized by asymmetric information). In the fourth section, conclusions will be drawn.

2. Basic characteristics of the technique examined and the background literature

In our previous works a distinctive and original technique of productive organization and project management, granted to firms operating in Italy following liberalizations introduced by the company law reform of 2003, was analysed in terms of its capacity to limit *a priori* the impact of possible failure of a specific project within the firm. This technique is founded on a process of setting aside (and totally isolating, both at the operative, legal and accounting level, from the rest of the firm) the operative assets strictly for carrying out the specific and "stand alone" project. The firm's creditors have no right to such assets, which have an equivalent in terms of a portion of equity, until the project is completed. Hence the preliminary consent of the firm's creditors is necessary for this operation unless the firm provides suitable forms of collateral as compensation for the temporary reduction in the capital "buffer".

This technique is applicable to a number of projects, each based on its specifically dedicated endowment of assets. Thus the maximum impact of the downside risk of each project in the firm stops being a problem which is difficult to forecast (especially in the case of particularly innovative projects) because the effects of possible failure are automatically limited to a set amount of assets that were isolated from the rest of the firm and dedicated entirely to the specific project. If the internal resources set aside become insufficient to carry through the project, they may be supplemented, based, however, not on internal but on external resources, or more precisely, on debt. Naturally, also this debt must be dedicated to the specific project. As a consequence, the claims of project's financiers rely exclusively on the assets set aside and on the project returns, not on the assets or returns of the firm. The reason is clear: this technique is able to create an effective shelter for the firm from excessive fall-out of the downside risk of the project only if the capital put at risk for the project is well-determined and immutable, without further injections in the event of unexpected needs.

As regards the literature on this question, there is a longstanding international debate about the usefulness of certain forms of separation among productive assets in the firm, with the support of appropriate financial instruments whose performance refers to the yield of separate assets. The case of tracking shares is well known, issued against operations of incorporation and assigned in payment to the shareholders of the incorporated firm. This is transformed into an independent compartment of the incorporating firm, with their own management results to which the performance of tracking shares is related (Billet-Vijh 2002, De Biasi 2002, Krantz 2004, Manzo-Scionti 2003, McLaughlin 2001, Schick 2009).

However, this is a “weak” separation insofar as the compartment, albeit independent, is not entirely separate from the rest of the firm (and the remuneration of tracking shares cannot exceed the overall income of the firm, which is why it is affected by any negative results of the firm itself). The debate appears much more limited with regard to the benefit of radically isolating within the firm specific bundles of productive resources, rather than entire productive compartments, for a limited, well-defined timeframe. Debate on the matter broadened following the reform in 2003 of Italian corporate law which, with a view to increasing liberalization and encouraging entrepreneurial dynamics, allowed for such an internal separation of company assets. However, it is not obvious that this debate has so far extended beyond Italy’s borders. The extensive literature by Italian scholars on this technique - which, we should point out, is not a way to reduce the risk of the project as such, but only to limit its downside impact in the firm - chiefly focuses on legal aspects (among others, Ferroni 2014, Minussi 2015, Bianco 2013, Egiziano 2010, Silvestro 2012, De Angelis 2003, Di Sabato 2004, Ortolani 2004, Fimmandò 2008, Pardolesi 2008, Fondazione Luca Pacioli 2003, Lenzi 2003, Marano 2004, Sparano-Adducci, 2003, Terrusi 2005, Salamone 2006) and to a lesser extent on managerial aspects that concern accounting or organizational issues (Fico 2004, Evangelista 2004, Dell’atti 2005, Oic 2005, Potito 2006, Bianca 2006, Verna 2004) or even those of governance and risk (La Rosa 2007, Intesa San Paolo 2016). On this point, two major problems have attracted most attention in the business management literature: first, the separation between productive resources in the firm does not result in appropriate and parallel separation of returns due to the permanence of shared costs; second, internal separations - if considerable - are able to fragment the firm, while they permit only small-scale projects if the internally separated resources constitute a small share of the entire firm.

Based on the above considerations widespread doubt was initially expressed about whether such separations could in practice be achieved. This conceptual position was particularly underlined by the Vice President of the Italian Academy of Business Management (Potito 2006), such that the potential of this technique to generate innovative projects were largely neglected in the first few years after the reform. Entrepreneurs and managers were almost entirely misinformed and the applications of this technique were very rare. Above all, it was not understood why one should use this technique to limit the impact of the downside risk of an innovative project rather than create a “newco”, a subsidiary, to position both the project and the risk outside the firm. In truth, they are criticisms that may largely be overcome on the basis of the following observations. With regard to the first problem mentioned above, the simplest solution is to increase the company’s capital by issuing new shares exclusively devoted to financing the specific project. This can radically eliminate the question of common costs and other ties with the rest of the firm. As regards the second problem, an acceptable solution would be to establish a small amount of the company’s capital as a cap for the resources allocated to the project, so that the firm’s single identity is not substantially compromised. Under Italian legislation this amount is set at 10% of the company’s capital, whatever the number of specific projects, each independent of the others and the rest of the firm. The fact that the share is small does not necessarily result in small-scale projects and, in any event, small-scale projects are not necessarily of little importance for highly innovative strategies. In truth, the low percentage of equity limiting these projects does not prevent companies that have a great deal of equity from developing substantial projects in the most advanced bound of innovation. In other words, the specific projects could have a pioneering role and may constitute, in many cases, the pyramidal shape of an innovative investment policy.

Finally, as regards the question of the alternative and traditional external solution represented by the newco, it can be countered that the reasons for internalizing rather than externalizing the project are a number as it is easy to argue from the structural differences and correlate different uses for subsidiary and operative internal island constituted by assets set aside for the specific project. In fact:

1. Subsidiaries can be constituted by Parent Corporation in different ways (by acquiring the control of an existing company or by creating new companies) and for various reasons. Instead, the island is created inside the existing corporation and has the exclusive purpose of achieving just one and stand-alone project within a limited and predetermined period of time.
2. A subsidiary corporation is not necessarily entirely owned by the parent corporation because is sufficient the majority of the shares. The island instead is entirely owned by the corporation, it is a part of this. Consequently also the control on the gradual achievement of the project is more direct, with reduction of monitoring costs. Also when the subsidiary would be created exclusively with the purpose of carry out such a project, the condition of externality would penalize the parent corporation monitoring, because of the interposition of another corporation, albeit controlled.

3. Since the innovative project in question is both limited in time and space and “stand alone”, resorting to a newco appears generally unwarranted. It would be a solution over dimensioned. Instead the island solution is “tailored” on the project and the costs of constitution and administrative, due to the duplications implicit in forming an external organism, is lower or absent. The subsidiary can better dilute its fixed cost if its activity is more extended than limited to a single project, while the island is typically useful for a single concentrate of risk and innovation (as a prototype for example). Were it subsequently to appear more convenient to expand or link the project up with other projects, this would seem more consistent with externalization. Then, and only then, a newco would be created.

However, the cost saving is not the most important reason to prefer internal islands. And also the limited dimension and the most direct and accurate monitoring of the project are not the fundamental matter, albeit of some importance. In my opinion the most important element that justifies this model is its compliance with the objective to reconcile two opposite requirements that are frequently found in corporations: on the one hand, the need to implement innovation (of process and product) to avoid exiting from the market due to more innovative competitors, on the other to prevent the possible failure of most innovative (and therefore riskier) projects involving the failure of the firm. The problem, in this case, is to delimit and isolate the “impact area” of negative effects of the downside risk (without limiting the upside) and also to define the period of maximum time of the exposure to such a high risk. In this regard, the model of the internal island is a better response than the subsidiary because it obtains *ex ante* a definition (clear, precise and drastic) both of:

- The impact area of the downside risk of the specific project, and
- Its maximum execution time.

In fact:

a) The resources allocated to the project (and thus placed at risk) are predetermined and no further contribution is forthcoming from the corporation, and moreover the project must be executed within the specified period. After then, if the project has not been executed, the resources previously segregated revert to the ordinary business context and the project, since that time, can no longer be made in isolation from the rest of the firm, but without distinction, along with other non-specific projects that are ordinarily made by the company. These very strict conditions are not voluntarily established by the company, but imposed by law in the country (Italy) where this instrument of specific project management is regulated. This obligation is a form of insurance against the possibility that the company intends to subsequently increase the capital exposed to the project risk and it is a protection for both the shareholders less inclined to take more risks and also the company's creditors. The latter, in particular, are able to know *ex-ante* how much (and for how long) of the company's resources exposed to the project risk will be segregated and subtracted from the creditor's claims.

b) These legal constraints are not provided in the case of a subsidiary. Even if the subsidiary is constituted exclusively to carry out that specific project, there is no *ex ante* constraint of not accruing capital in addition to that initially conferred? And even if the parent corporation voluntarily takes on this constraint (perhaps to reassure its creditors that it will not put more capital at risk), it could circumvent such a constraint through opaque (and generally not legal) tunnelling operations inside the group, especially if the constitution of subsidiaries is a widespread strategy of the parent company.

Therefore, there is no limitation of the impact of the downside risk of the project only to the capital conferred at the time the subsidiary was established or it can be safely removed. Consequently the risk extends to the parent corporation. Even if the parent and subsidiary remain separate legal entities, and the obligations of one are separate from those of the other, is uncertain this separation always immunizes the parent corporation from financial responsibility for the subsidiary's liabilities. In fact sometimes the American courts have considered the two corporations as one entity for liability purposes. In conclusion also the purpose of delimiting the fall out of the downside risk of the project is better pursued in the case of the island. The solution of a subsidiary for a limited and stand-alone project is not only excessive and more expensive but also less transparent than the internal island. This is an aspect that has been considered by Italian legislator, which has clearly explicated that these internal islands are useful to limit the irrational creation of subsidiaries not justified by real productive opportunities.

In conclusion, even if it is not possible to say that the internal "island" is better in absolute terms than the subsidiary as an instrument to achieve the specific project, it is possible, however, to perceive whether one or the other is more consistent with the limits the company seeks to set to the fall-out of risks inherent in the project and the time of its execution. If the aim of the corporation is to implement the project without constraints (because the lack of constraints is not a problem for shareholders and creditors), the subsidiary responds better to that purpose. If, instead, and this is the case considered in my paper, the aim is to define rigidly the impact area of the downside risk of the project and the maximum time of its execution, the creation of an internal island is a more consistent solution in my opinion.

Moreover, even if it were possible to set a strong limit to the subsidiary, similar to those of the internal island, what would be the reason to prefer this "external" island to that internal? In this case, for comparative evaluation, those elements we considered of limited importance such as cost savings and better monitoring would assume greater importance, and would play, in any case, in favour of the choice of the internal island.

In any event, the criticism and positions of caution towards such a discordant solution of project management compared with traditional practice has for some time been an obstacle to the spread of this technique. Only in recent years has there been increasing interest on the part of practitioners, in parallel with a new cohort of studies (amongst others Cuccuru 2009, Egiziano 2009, Castoldi 2007, De Crescenzo 2011). To have an idea of the interest created in this technique, suffice it to think while in July 2005, two years after the introduction of this new instrument, as few as three firms had adopted it, by April 2008, according to data tracked at the Union of the Italian Chambers of Commerce (La Rosa, 2014), as many as 2190 companies had incorporated into their statute the possibility of establishing separated assets and 387 other companies had amended what was already written in their statutes at this regard (clearly with a view to using this technique). In percentage terms, the total of these two numbers accounts for only 2% of all Italian companies, yet after just three years the growth of interest in this instrument is nonetheless impressive, especially after what appeared like an initial failure. It is easy to presume that since 2008 the number has increased much further, even though no documentation has been obtained from the same source as that used by La Rosa.

However, there is still no evidence that this technique has been used especially to execute highly innovative and high-risk projects. This shows that, while the rationale underpinning asset separation for a specific project appears to be increasingly accepted, both in practice and in theory there is a considerable delay in the perception of what is, however, the most important advantage offered by this technique. Even before this perception gap concerning the more advantageous aspects has been filled in the country where the operative instrument was conceived, it is nonetheless possible to lay the basis for extending it internationally, with effects in terms of more innovative behaviour and, especially, on firms market value. To contribute to eliminating this gap it would seem useful to propose at this stage a new approach to this issue, adopting an investigative method that rests on the analysis of limited-rationality behaviour of agents and principals of firms in an imperfect market.

3. The combined effects from the 'spin': limits to downside risk fall-out of the project, reduction of adverse behaviour towards innovation, better appreciation of the company's value

Now we can examine precisely how isolating a specific project is able to reduce the reluctance of many managers and shareholders to take the risk of innovating. This reluctance can be interpreted as sub-optimal behaviour, due to a kind of bias similar to those examined in behavioural finance, especially in the pioneer studies of Kahneman (Kahneman D. - Tversky A. 1981). Although in practice this is not always intended as a bias in the proper sense because it can be in part realistically justified in the conceptual context of the prevention of "bankruptcy costs" (Hull, 2008), it nevertheless produces an inefficient allocation of the resources, both at the firm level and at that of the general economy, as may be easily demonstrated using the Capital Asset Pricing Model as a standard of project acceptability, any new project should be considered equal to a share being vetted for inclusion in a diversified portfolio.

The company should therefore simply calculate the beta value of the project and the implied level of the expected rate of return: if it is greater than that required by CAPM, the project should be accepted; otherwise it should be rejected. During this assessment process, the managers who take the decisions – if their interests are aligned with those of the shareholders – should only consider systematic risk, given that non-systematic risk should be reduced to zero by stockholders through the construction of well diversified portfolios. It is thus easy for a firm to determine the minimum threshold of expected return based on the β of the project.

More precisely, given an enterprise, for simplicity, assumed as unlisted and non-leveraged (in any case these assumptions will be removed later), and assuming that:

β_0 is the beta (estimated) of the enterprise,

i , the risk-free interest rate

μ_M , the expected return of market portfolio

μ_0 , they expect return, in equilibrium, on the share capital (cost of equity),

Then the following condition must be satisfied:

$$\mu_0 = i + \beta_0 (\mu_M - i)$$

And hence the firm can rationally accept each new project whose risk is equal to β_0 only under the condition, with μ_N the expected value of the project, that:

$$\mu_N \geq \mu_0$$

The firm can rationally accept each new project with a risk $\beta_N \neq \beta_0$ only if

$$\mu_N \geq i + \beta_N (\mu_M - i).$$

In a graphical representation the project is accepted if β_N , which represents the new project, is situated on or above the Security Market line.

An example can be useful. Let:

Risk-free interest rate = 0.04

Expected return of market portfolio $\mu_M = 0.30$

And $\beta_0 = 0.6$.

The expected return in equilibrium of the project portfolio consistent with the SML is

$$\mu_0 = 0.04 + 0.6 \cdot (0.30 - 0.04) = 0.196$$

Hence each new project with $\beta = 0.6$ would be accepted if its expected return is not below 0.196, that is 19.6%. In other words, a new project for which $\beta > 0.6$ can be accepted only if its expected return is over 0.196. If the new project had a β value of 0.7, the expected return would be no less than 0.222 (22.2%). Under this condition the project would be advantageous and would be accepted.

In reality, things often go a little differently (Hull, 2007). Since managers want to preserve their position they may well have vested interests in the stability of profits and the survival of the firm. Therefore they take into consideration a broader configuration of risk. In other word, except for rare cases in which the diversification of project portfolios can be carried out within the same company (in-house), they will take into consideration not only systematic risks, but also those that theoretically have no effect on a shareholder's diversified portfolio but that may have excessive consequences for the company as a whole. Thus managers often decide not to consider a project that, though it has high-expected returns, has too high a variance compared to their personal risk threshold. While this behaviour appears in theory to conflict with shareholders' interests, it seems to be favoured by the majority due to a psychological aversion to excessive risk: they do not operate sophisticated distinctions between diversifiable and non-diversifiable risk. In this way, given the convergence in the interests of managers and shareholders (albeit with different motivations), particularly innovative and highly profitable projects are often rejected if they are also, as is so often the case for such projects, particularly risky. These are sub-optimal behaviours both according to the CAPM logic but also on a practical level.

Also, in so doing, a firm can stray dangerously far from the innovation frontier and become marginalized by the market if there are more aggressive and fortunate competitors present. The technique, analysed herein, of isolating highly risky projects within the firm, which are not too sizeable but nonetheless highly relevant to innovation, can represent a valid contribution to the reduction of the sub-optimal behaviour discussed above, moving the innovation frontier forward. This technique of isolating a specific project can also generate variations in equity market value, under the collective action of elements that are indeed in conflict with one another. Such effects on equity market value represent the focal point of our analysis, even more than the equally important impulse this technique can give to more innovative entrepreneurial behaviour. Indeed, when the problem is examined from the shareholders' standpoint, it must be considered that what interests them is not so much the innovation in itself but the return on investment in the company's shares. The innovation represents only the tool, or even an intermediate stage (which is generally, but not always, essential), to achieve the result that most interest the equity holder.

Following the seminal analysis by Black and Scholes (1973), equity may be conceived as a call option on the firm's assets. Equity represents to what extent the investors/shareholders are willing to expose themselves to risk for the firm and the strike price is equal to the repayment required on the outstanding debt.

By the same token, the portion of equity equivalent to the assets set aside for the project can be considered from the firm's standpoint a call option on the project. The assets set aside represent to what extent the company is willing to expose itself to risk for the project in question. Hence it is a call option for the company, and indirectly for the shareholders. If the specific project is achieved not exclusively by means of the internal productive resources of the firm specifically set aside, the strike price is equal to the repayment required on the outstanding debt exclusively referring to the project. If the assets set aside are considered as an independent firm within the firm, the option represented by the part of capital incorporated in the assets set aside can be considered "an option-within-an-option".

From the accounting standpoint, the partitioning of the firm's activities gives a zero sum game; the equity book value does not change. Can the same be said for the equity market value or could, in partitioning assets and channelling some to a high-risk project, the result leads to a variation in the equity market value? The analysis has to compare the diverse effects of a company policy deciding to carry out the project with no isolation from other projects, with that of isolating the project. The considerations that follow first refer to the context of a perfectly efficient market and then to that of a feebly efficient market.

3.1 Implications for equity value in an efficient market

On the basis of the conceptual options model, as in the case of a financial option, whose price increases with the volatility of the underlying security, the market value of the equity as call option increases with the volatility of the assets of the firm? Such volatility, in turn, increases by adding, to the former, new investments at a higher risk, or rather – since it is more consistent with the *ceteris paribus* condition - in the existing portfolio of projects one project is replaced with another at a higher risk. As a consequence of this substitution the risk increases for the whole project portfolio. Does the value of equity as option increase as well and does the unleveraged or leveraged status of the firm impact on this? The answer is immediately based on the propositions of Modigliani-Miller. The equity market value increases (or does not) following the market's evaluation of the benefit of this substitution, taking into accounts the expected value and its volatility. In a perfectly efficient market each variation in the trade-off between risk and return produces an immediate reaction: the variation in one component is immediately balanced by a suitable opposite variation in the other, thereby constantly ensuring the position of equilibrium. It is not conditional upon the financial structure of the firm. Naturally, in the case of the unleveraged firm the compensation is linear and only the equity value and the expected return are affected; in the case of a leveraged enterprise, a larger number of compensations are at stake, which make the context more complex. However, the final result is the same: a neutral effect.

In fact, the market price of equity receives two opposite pushes. The first is positive and tied to the feasibility of projects at higher risk because the increase in the downside risk of the portfolio's return is partly offloaded on the enterprise's creditors, whereas the increase in the upside risk is a benefit only for the shareholders, not for creditors whose remuneration is predetermined and independent of both the results of the firm and the specific project. The second push regards the fact that the riskier the portfolio becomes, the lower the value of the debt and so the higher its cost. This generates an interlinked series of actions and reaction on the weighted average cost of capital (WACC) and equity market value, with a final result that is always neutral. These considerations are surely founded if they refer – in a context of a perfectly efficient market - to the general case of a new investment. Do the same considerations also apply to our case, in which the new investment concerns not a generic project that is achieved by means of indistinct resources among those present in the firm, but a project that will be carried out by assets specifically set aside and separated from the rest of the firm? Because of the new investment, the volatility of the firm's total assets rises and with it the value of the entire equity as a call option according to the Black-Scholes model. From all the evidence, however, this increase is simply due to the increased volatility of the firm's total assets, achieved by adding a new higher risk project, independently of whether the investment may or may not result from a particular technique of asset separation within the firm. Even in this case the concatenation of actions and reactions examined above takes place, and the final result is the same.

3.2 Implications for company value in an imperfect market

What happens instead in an imperfect market? The assets of the firm once the separation is realized are exposed to different levels of risk; the assets set aside for the project are exposed to a higher risk. The volatility of the entire equity increases as a call option under the influence of the higher volatility of the specific project and this increase is not exactly offset by opposing down pricing action.

In other words, the rebalancing in the chain of actions and reactions, which inevitably emerge and always follow the scheme already examined, does not lead to a zero-sum game as occurs in the case of perfect market. In fact, we must consider that:

- The reactions are not perfectly suited to the actions, nor are they opportune. There is always an overreaction or under reaction *is-à-vis* the action and there is a time lag between the different effects;
- The increase in the cost of debt does not occur quickly (if the debt has a fixed interest) but only at the time of refunding. Thus in the meantime, the company will continue to benefit from the old cost of debt and the creditors are subject to a greater risk because of the new investment.

In other words, the value of the call option represented by the assets set aside can increase with the volatility of the specific project because of an imperfectly compensatory chain of actions and reactions at the level of whole-firm value. Hence the imperfections of the market can be an opportunity for shareholders as agents to speculate (at the creditors' expense as principal) particularly if the market overvalues the effects of such projects, as is completely possible given the proposed hypotheses concerning the limitations of the impact of the downside risk. All the shareholders can obtain benefits from this technique as can be demonstrated with a simple application, based on the hypothesis that the company has the opportunity to embark on a highly innovative project, replacing a less innovative endeavour, in the context of a project portfolio consists of 10 projects. Let us assume that the company and the project are not levered (a hypothesis concerns the simplest case but that can be easily removed) and the new project has $\beta_N = 1.5$ and expected return = 90. Is this project acceptable for a firm project portfolio whose other 9 projects have, following the previous example, $\beta_0 = 0.6$ and $\mu_0 = 0.196$ in a market environment where $\mu_M = 0.30$ and $i = 0.04$?

On the basis of the formulas already applied, for a project with a similar β_N to be accepted (i.e., such that it is situated on or above the SML) it is sufficient for it to have an expected yield of not less than 0.43, i.e. 43%. Indeed:

$$\mu_n \geq 0.04 + 1.5 \times (0.30 - 0.04)$$

That is,

$$\mu_n \geq 0.43$$

Hence any project with $\beta \leq 1.5$ and $\mu_n \geq 0.43$ expected returns should be acceptable for the enterprise. Since the new project has almost double the expected return, then it should be enthusiastically accepted if we assess it exclusively on a CAPM basis. In reality, however, if our shareholders and managers fear that a strong sensitivity of the project to systematic risk may affect the entire company and therefore do not accept projects with higher β , than say 1, i.e. 100%, the project question, despite the very high expected return, will be rejected. Or, at least, this would happen in the normal case of a project that is not isolated from the rest, the result of which, if negative, may have consequences that go beyond the value of the resources involved in the project, with the excess cost impacting on the entire enterprise. In this case, the entire corporate capital would suffer the effect of the downside risk and decidedly risk-averse shareholders cannot accept this, especially if the company is not heavily in debt (as is usual if the shareholders are particularly risk-averse) and is highly capitalized. That is, if the shareholders have much to lose if the project fails. If as an alternative it is a specific project of the type considered here, whose possible total failure does not involve any more damage to the company than the capital invested in it (and this, in turn, is not more than, say, one tenth of the entire corporate capital) shareholders and managers may well accept it because the downside risk is largely "sterilized" in its actual relapse, since its impact area is kept within narrow boundaries, while the positive impact connected to the upside risk is full and unconfined.

In fact, given the expected return equal to 90% of the capital invested in the specific project, assuming a total company capital of 100, as equity, of which 10 is invested in the project, and assuming that the still intact distribution of results is binomial (but the considerations are even more valid if the curve has a very long tail to the left, also extended on the negative side of the x axis), then if everything goes wrong the loss to the company is 10 (10% of capital). If everything goes normally, i.e. according to expectations, the gain stops at the expected value of 9 (90% of 10), and if the results are excellent the gain can reach much higher figures as hinted by such volatility. Hence the practical effect of volatility is "limited", on the negative side (downside risk) to a maximum loss of 10 - because that is its greatest negative impact on the company - while it extends to a much larger and potentially unlimited field for the upside, considering a somewhat flattened probability distribution and therefore with very long tails. The dimension of volatility has strategic importance.

The flatter the curve of the returns distribution, the more this technique is beneficial. It is clear that the significant advantage of this technique is greater in the case of a leveraged company. However the technique we examine allows good, albeit smaller opportunities even when the company is unleveraged. In practice, it may be interesting to examine, through another example, what the change in equity value (our call) would be following the insertion of the new project in the case of an unleveraged firm. We know that the value of the call represented by equity varies with the value of the underlying asset) which in our case is the entire project portfolio. Suppose that the relation between the variation in the value of the underlying asset (the total project portfolio) and the variation in value of the call (which in this case is the equity) is:

$$\text{CALL} = 0.8 S$$

Where S indicates the underlying value, given by a portfolio of projects. Given the above relationship, if the value of the underlying asset, i.e. the total number of projects, which was supposed equal to 100, varies by X, the price of the call varies by 0.8 X. The underlying value varies, in turn, with changes in its own composition, determining a different volatility and a different expected return. The underlying volatility, in our case, increases by the insertion of the new project and goes from 0.60, which was the volatility of the 10 existing projects, to 0.69. The new volatility is given by 0.60 for 9 projects and 1.5 for the new project.

Consequently, since we have assumed that the variation in the call represented by the equity is 0.8 of the underlying variation, the variation for the equity as call will be $0.09 \times 0.8 = 0.072$. This is an increase of more than 7%, and it is certainly tempting, for this increase concerns the case of an unleveraged firm. If the example is extended to the case of a leveraged firm (thus the debt becomes the strike price of the call option) and even the case the same project being leveraged, the benefit to shareholders may be much greater. Naturally the benefit is increased to the extent that the inclusion of the project does not produce a compensatory reaction, as noted above. Obviously, also a non-isolated investment, if highly innovative and risky, could raise the volatility of the project portfolio and hence the overall value of equity capital as a call option. However, the benefits of limiting the downside risk impact would be absent. Furthermore, it would be much more difficult or impossible to estimate precisely the specific contribution of a new but non-isolated project to volatility of the project portfolio and to the firm's overall returns due to the links with the various areas of the firm and the presence of shared costs. The contribution with the isolated specific project can indeed be quantified after its execution and also a forecast of its performance is facilitated by the absence of links with the rest of the firm.

4. Discussion and Conclusion

From the above analysis, it is clear that the consequences of such a strategy of productive and financial isolation in a context of imperfect market differ significantly from those obtained in the context of a perfect market, as in the case of Modigliani-Miller. In the M&M world, whatever division there may be between asset areas within the firm, by itself this produces no effect on the market value of the firm. The call option on the assets resulting from the adoption of a specific project adds no value to the equity as call option on the firm's assets. Indeed, the concentration of a higher level of risk in an isolated portion of assets leads to a chain of actions and reactions with balanced effects.

On the contrary, in the more realistic context of imperfect capital markets the chain of actions and reactions, based on information asymmetries, is blocked or insufficient to guarantee that the game is zero-sum. Thus the possibility of limiting the impact of downside risk for certain projects without a corresponding decrease in the impact of upside (and without there being perfectly compensatory effects, when the firm is levered, in terms of less value, hence greater cost of debt) makes it more worthwhile for the firm – or rather, for the equity holders - to make risky investments. In fact, the presence of corporate debt whose cost does not rise proportionally with the increase in the risk of the project portfolio acts as a lever on the call option value represented by equity. And this effect is also stronger in the case in which the project is leveraged with its own debt whose cost compares favourably with the return on the specific project. Naturally, the impact of the possible failure of the project exceeding the capital put at risk by the company inevitably falls on the creditors of the project if this is leveraged.

To a certain extent, even the firm's creditors are damaged due to the reduction in equity that is a protective cushion for their credit. Since we hypothesize an imperfect market, the reactions on the cost of debt when the firm decides to execute the project are not perfectly commensurate with this risk, and if the increase in this cost is insufficient this generally benefits the shareholders and increases the value of their call option as equity holders.

This event would appear more likely than the opposite case. Indeed, if the consent of the creditors were granted on conditions that the company found too burdensome, the company would not accept the project. Because managers and shareholders decide to take on the project only once the creditors have given their opinion, they play on the fact that the cost of creditor consent or of the guarantees is known *ex ante* (while for the creditors the expected benefits on repayment of the credit are uncertain). If the project is executed, it is evidently only because the company's creditors do not demand excessive compensation or are themselves convinced that, without this technique, in any event the company could achieve high-risk projects without delimiting the downside risk, with consequently greater damage from their standpoint.

Obviously these considerations clearly envisage a great scope for further studies on the optimal criteria of a trade-off construction between creditors and shareholders to address the need, the more pressing the more competitive the market is, of an innovative behaviour of managers and shareholders control that, far from disguising a moral hazard, is directed at preserving the competitiveness of the enterprise itself in order to protect the interests of all stakeholders. Interest in the development of this line of research is of course far beyond the philosophy of creditor protection with simple covenants and efforts for the convergence conditions of the interests of all stakeholders on the guidelines of innovation as foundation of firm value creation. This line of research should also go well beyond the risk segmentation techniques between traditional classes of lenders represented by shareholders and creditors, between the different sub-classes of shareholders and creditors, in function of a hierarchical subordination to the enterprise overall risk, which has been carried out for some time in practice, but it should go into it, much more than has been done so far, in the correlation between the separate management of tangible or intangible assets segmented for different risk degrees with similar liabilities segmented by subjection to those single and different risk degrees of assets that they fund.

Ultimately it is getting to the core of the segmentation of the overall business risk of availability of subsets of lenders to earmark their specific resources for financing the management of specific elements of the assets of the enterprise, correlating them risk periodic returns and the return of capital, in a manner, however, compatible with the maintenance of the unity of the overall management, otherwise threatened by these internal partitions. The theme is not new and in fact in operational practice various experiments in this direction have been followed with success for several years, which have also affected the various methods of organization of the separation, within the company, and its areas or types of investments with reflections about the real possibility of precise risk segmentation. Also it is not clear that the objective of a similar special management of enucleating and internal isolation has been carried out to promote innovation, at least in terms of focused and specialized innovation, but that it was the result of other reasons (consider for example the case of tracking stocks). So the research on internal separations for innovative purposes defined and circumscribed perhaps is still in its early stages and is still surrounded by a certain disorder in the basic assumptions and objectives to be pursued, which entails the opportunity for far greater depth in theoretical and experimental in practice, with obvious implications in terms of adaptations and much more specialized internal redefinitions in the risk management function.

Acknowledgements

The author is grateful to Marco Pagano and Lucio Sarno for the very helpful comments and suggestions.

References

- Baker & McKenzie. (2001). November, Tracking Shares v Spin-offs. A Newsletter of the Mergers & Acquisitions Practice Group, Australia. [Online] Available: <http://www.bakerinfo.com>.
- Bianca M. (2006). La struttura finanziaria delle imprese mutualistiche: spunti in merito alla costituzione di patrimoni destinati da parte di società cooperative a mutualità prevalente, *Rivista delle società*.
- Bianco P. (2013). I patrimonidestinati: come minimizzareilrischiodell'internal venturing, *Convegno Camera di Commercio di Torino*, 5 novembre 2013. [Online] Available: <http://www.musybiancoassociati.it>
- Black, F. and Scholes, M. (1973). The Pricing of Option and Corporate Liabilities. *Journal of Political Economy*, 81 (3), pp. 637-654.
- Billet, M.T. and Vijh, A.M. (2001). The market performance of tracking stocks. Working paper. [Online] Available: <http://www.ssrn.com>

- Billet, M.T. and Vijh, A.M. (2002). Long term returns from tracking stocks. Working paper. [Online] Available: <http://www.ssrn.com>
- Castoldi, L. (2007). La creazione di un patrimonio destinato: analisi di un caso concreto. *Impresa commerciale e industriale*, Vol.29, Fasc. 11, pp. 1545-1551.
- Cuccuro, A. (2009). Patrimonio destinato di insolvenza”. *Contratto e Impresa*.no. 2, p. 422.
- De Angelis, L. (2003). Appunti sui profili di diritto contabile e tributario concernenti i patrimoni destinati a specifici affari. *Rivista di diritto dell'impresa*, n.2, pp. 281-286.
- De Crescenzo, M. (2011). I patrimoni e i finanziamenti destinati ad uno specifico affare. *Bruno libri*, Salerno.
- Dell'Atti, A. (2005). I Patrimoni Destinati a uno Specifico Affare. *Cacucci Editore*, Bari, pp. 20-22.
- De Biasi, P. (2002). <<Burro e cannoni>>: le alphabet stock. *Le Società*, No. 7.
- Di Sabato, F. (2004). Strumenti di partecipazione a specifici affari con patrimoni separati e obbligazioni sottoscritte dagli investitori finanziari. *Banca Borsa e Titoli di Credito*, Part I, p.13.
- Egiziano, L. (2009). Separazione patrimoniale e tutela dei creditori: I patrimoni destinati ad uno specifico affare, *Giappichelli*, Torino.
- Egiziano, L. (2010). I patrimoni di destinazione delle società. [Online] Available: <http://www.comparazioneDirittoCivile.it>, ISSN 2037-5662
- Evangelista, S. (2004). I Patrimoni Dedicati: Considerazioni Economico-Aziendali, in Di Cagno, N. (eds), *La Riforma del Diritto Societario*, Cacucci Editore, Bari, pp. 538-541.
- Ferroni G. (2014). Patrimonio di destinazione e responsabilità patrimoniale, *Cultura giuridica e cultura vivente*, vol. 1, Dipartimento di Giurisprudenza (DiGiur), Università di Urbino, *UniURB Open Journals* ISSN 2384-8901
- Fico, D. (2004). Aspetti contabili dei patrimoni destinati. *Le Società*, Vol.23, Fasc.10, p.1216.
- Fimmanò, F. (2005). Le Destinazioni Industriali Dei Patrimoni Sociali. *Rivista di Diritto Bancario*, 9.
- Fimmanò, F. (2008). Patrimonio destinato e tutela dei creditori nella società per azioni, *Giuffrè*. Milan. *Fondazione Luca Pacioli*, (2003). *Patrimoni Destinati ad uno Specifico Affare* (Artt. 2447-bis e ss del codice civile), Circular no. 12/2003, Document no. 24 of 26th November 2003. [Online] Available: <http://www.fondazioneLucaPacioli.it>
- Krantz, M. (2004). Remember Tracking Stocks? More are History, Document of 2nd September 2004. [Online] Available: <http://www.usatoday.com>
- Hull, J.C. (2008). *Risk Management and Financial Institutions*, Pearson International Edition.
- Intesa San Paolo (2016). *Relazioni di governo societario e assetti proprietari*, Parte II. [Online] Available: <http://group.intesasanpaolo.com>
- Kahneman, D. – Slovic, P. - Tversky, A. (1981). *Judgement Under Uncertainty. Heuristics and biases*. Cambridge University Press, Cambridge.
- La Rosa, F. (2007). *Patrimoni e finanziamenti destinati ad uno specifico affare. “Ottica destinazione e ottica separazione”*: analisi delle prospettive di sviluppo e dei profili di rischio connessi ai nuovi strumenti di “federalismo” patrimoniale e finanziario, *Giuffrè Editore*, Milan.
- La Rosa, F. (2014). Dispense on line del corso di lezioni, Anno Accademico 2013-2014, Università Kore di Enna.
- Lenzi, R. (2003). I patrimoni destinati: costituzione e dinamica dell'affare. *Rivista Notarile*, Parte I.
- Manzo, G. e Scionti, G. (2003). *Patrimoni dedicati e azioni correlate: “cellule” fuori controllo?*. *Le Società* n.10.
- Marano, G. (2004). I patrimoni destinati in una prospettiva di analisi giuridico-economica. *Banca d'Italia*, *Quaderni di ricerca giuridica della Consulenza Legale*, n. 57.
- Merton, R.C. (1973). *Theory of Rational Option Pricing*. *Bell Journal of Economics and Management Science*, n. 4, pp. 141-183.
- Minussi D. (2012). *Finanziamento dedicato ad uno specifico affare (patrimoni destinati)* [Online] Available: http://www.e-glossa.it/wiki/finanziamento_dedicato_ad_uno_specifico_affare_%28patrimoni_destinati%29.aspx
- Minussi D. (2015). *I patrimoni destinati ad uno specifico affare*. [Online] Available: http://www.e-glossa.it/wiki/i_patrimoni_destinati_ad_uno_specifico_affare.aspx
- Modigliani, F. and Miller, M.H. (1958). *The Cost of Capital, Corporation Finance and the Theory of Investment*. *The American Economic Review*, 48 (3), pp. 261-297.
- OIC – Organismo Italiano di Contabilità. (2005). *Patrimoni e Finanziamenti Destinati a uno Specifico Affare*. [Online] Available: <http://www.fondazioneoic.eu>, 2.

- Ortolani, A. (2004). I patrimoni dedicati ad un specifico affare. In N. Di Cagno (eds.), *La riforma del diritto societario*, Cacucci Editore, Bari.
- Pardolesi R. (2008). Destinazioni patrimoniali e trust internazionale, *Rivista critica del diritto privato*, n.2
- Potito, L. (2006). Patrimoni destinati. Problematice contabili e di bilancio. *Rivista dei dottorici commercialisti*, anno LVII, Fasc.3.
- Salamone, L. (2006). Il finanziamento dei patrimoni destinati a <<specifici affari>>. *Rivista di Giurisprudenza Commerciale*, Vol. 33 (2), pp. 113-114.
- Schick, J. (2009). Toward Transaction -Specific Standard of Directorial Fiduciary Duty in the Tracking Stock Context. *Washington Law Review*, vol.75, n. 4, p. 2000.
- Silvestro P. (2012). Il patrimonio destinato ad un unico affare. Aspetti di interesse notarile, XI.1– gennaio-marzo 2012. [Online] Available: <http://www.dircomm.it>
- Sparano R. e Adducci, E. (2003). Patrimoni destinati a un specifico affare: dalla costituzione all'accessione. *Diritto e pratica della società*, n. 24, pp. 27-33.
- Terrusi, F. (2005). I patrimoni delle p.a. destinati a un specifico affare: analisi della disciplina e verifica degli effetti. [Online] Available: <http://www.judicium.it> (Testo della Relazione al Convegno di studio organizzato da Fondazione Cesifin Alberto Predieri – Centro per lo studio delle istituzioni finanziarie – su “Riforma del diritto societario e riflessi sulle procedure concorsuali” - Lucca, 4th March 2004).
- Verna, G. (2004). Osservazioni sulla rappresentazione contabile dei patrimoni destinati a specifici affari. *Le Società*, n. 11.