Strategic Risk Taking – A framework for risk management

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Introduction

Risk pervades our daily life. Without taking risk we cannot thrive. Every major advance in human civilization has been made possible because someone was willing to take risk and challenge the status quo. In man's early days, physical and economic risk went hand in hand. The development of shipping trades facilitated the separation of economic and physical risk. Then came the Renaissance and scientific thinking. Various advances were made in probability theory. Harry Markowitz's portfolio theory was another important landmark. Risk management has become increasingly sophisticated in recent years thanks to the availability of a range of financial instruments. But as the recent sub prime crisis shows, risk manangement continues to pose challenges.

What is risk?

Risk must have two attributes: uncertainty about outcome, impact on utility. A threat is a low probability event with large negative consequences where analysts may be unable to access the probability. A risk is a higher probability event where there is enough information to assess both the probability and the consequences. Risk in finance is defined as the variability of actual returns on investment around an expected return. The Chinese symbol for risk is a combination of danger and opportunity, representing the downside and upside of risk. The essence of good management is making the right choices when it comes to dealing with different risks. The most successful companies are good at finding particular risks that they are better at exploiting than their competitors.

The Duality of risk

It is part of human nature to be attracted to risk. At the same time, there is evidence that human beings try to avoid risk in both physical and financial pursuits. Some individuals take more risk than others. Utility from an additional unit of income will decrease with wealth. Utility increases as wealth increases, at a declining rate.

Risk taking is affected by the way choices are framed. Individuals may be risk seeking in some situations and risk averse in others. Individuals feel more pain from losses than from equivalent gains.

Individuals are generally risk averse and more so when the stakes are large than when they are small. There are big differences in risk aversion across the population and noticeable differences across sub groups. Individuals are far more affected by losses than by equivalent gains. The choices that people make when presented with risky choices or gambles depend on how the choice is presented. Individuals tend to be much

more willing to take risk with what they consider found money than with money they have earned.

There are two scenarios where risk aversion seems to decrease and is even replaced by risk seeking. One is when individuals are offered the chance of making an extremely large sum with a small probability of success. The other is when individuals who have lost money are presented with choices made allow them to make their money back. When faced with risky choices, individuals often make mistakes in assessing the probabilities of outcomes, over estimating the likelihood of success. The problem gets worse as the choices become more complex.

Measuring risk

Luca Pacioli, an Italian Mork framed a famous problem. Two gamblers are playing a best-of-five dice game. They are interrupted after three games with one gambler leading 2 to 1. What is the fairest way to divide the pot between the two gamblers, taking into account the current status of the game? Blaise Pascal and Pierre de Format solved the problem after about 160 years.

Markowitz changed the way we think about risk by linking the risk of a portfolio to the co-movement between individual asset in that portfolio. His key insight was that the variance of portfolio could be written as a function of not only how much was invested in each security and the variance of the individual securities but also of the correlation between the securities. Markowitz derived the set of optimal portfolios for different levels of risk and called it the efficient frontier. The Markowitz approach reduces investor choices down to two dimensions. The “good” dimension is captured in the expected return on an investment and the bad dimension in the variance of the return. In general, the risk of an asset can be measured by the risk it adds to he portfolio that it becomes a part of. The key issue is not the volatility of the asset but how much it is correlated to the portfolio. An asst that is extremely volatile but moves independently of the rest of the assts in a portfolio will add little risk to the portfolio.

Capital Asset Pricing Model

Combinations of the risk less asset and a super efficient portfolio generated higher expected returns for every given level of risk than holding just a portfolio of risky assets. Depending on their risk preference, investors can put part of their money in the market portfolio and the remaining in the risk free asset. Investors who want to take more risk can borrow at the risk free rate and invest their money in the super efficient portfolio. If we accept the CAPM and its various assumptions, we can compute the risk of an asst as the ratio of the covariance of the asset with the market portfolio to the variance of the market portfolio.

Power law distributions

The mean variance framework has been challenged by critics.

Investment returns exhibit too many large values to be drawn from a normal distribution. The symmetry of the normal distribution does not apply in real life.

Distributions that allow for price jumps are more realistic. Mandelbrot argued that the normal and log normal distributions were best suited for series that exhibited mild and well behaved randomness but power law distributions (of the type y= αk) were more suited for series that exhibited large movements and wild randomness.

Wild randomness means a single observation can affect the population in a disproportionate way. Stock and commodity prices seem to fit in this group. Measures such as volatility and beta tend to underestimate the risk of large movements. Another criticism of the mean-variance framework and the normal distribution is that return distributions for stocks and most other assets are not symmetric. Asset returns exhibit fat tails and are more likely to have extreme positive values than negative values. Critics of the mean variance framework argue that it takes too narrow a view of both rewards and risk. A fuller return measure should consider not just the magnitude of expected returns but also the likely hood of very large returns or skew ness. A more complete risk measure must include both variance the possibility of big jumps.

Jump process models

Considering the reality that stock prices do jump, some have argued for the use of jump process distributions to derive risk measures. Press has argued that stock prices follow a combination of a continues price distribution and a Poisson distribution where prices jump at irregular intervals. But the parameters of jump process models are difficult to estimate accurately.

Arbitrage pricing model

Two assets with the same exposure to risk had to conform to the law of one price. Using factor analysis, Ross measured each stock's exposure to multiple factors. Essentially, the Arbitrage Pricing Model replaced the single market risk factor in CAPM by multiple market risk factors. A single market beta is replaced by multiple factor betas. The model does not make any restrictive assumptions about investor utility functions or return distribution of assets. But the model depends heavily on historical price data.

Multifactor models

A PM restricts itself to historical data. Multifactor models expand the data used to include macro economic data in some versions and firm specific data in others. These models assume that stocks that earn high returns over long periods must be riskier than those than earn low returns over the same period. These models look for external data that can explain the differences in returns across stocks. For example, Fama, and French found that over the period 1962 – 1990, smaller market cap companies and those with higher book to price ratios generated higher annual returns than larger market cap companies and those with low book to price ratio.

Linkages with corporate finance

The most common way of adjusting for risk is to compute a value that is risk adjusted. Risk adjustment can take the form of a higher discount rate or a reduction in expected cash flows. We can also do a post valuation adjustment to the value obtained for an asset. Risk adjustment can also be made by observing how the market discounts the value of assets of similar risk.

The value of any asset is the present value of the expected cash flows on the asset. Either we can use the same expected cash flows that a risk neutral investor would have used and adjusted the risk free rate by adding a premium. Or we can use the risk free rate as the discount rate and adjust the expected cash flows for risk, i.e., we replaced uncertain cash flows by certainty equivalent cash flows. The more popular method is the risk adjusted discount rate approach. We use higher discount rates to discount expected cash flows when valuing riskier assets and lower discount rates when valuing safer assets.

Some of the key issues which remain unresolved are:

- Whether to use the same discount rate for different periods.
- Whether to use the same discount rate or item specific discount rate.
- What discount rate to use for negative cash flows. (High discount rate would reduce the present value of negative cash flows).

Another approach is Certainty equivalent cash flows.. Risk return models can be used to calculate the certainty equivalent. Certainty equivalent cash flow = Expected cash flow / 1+ risk premium

Another approach is cash flow haircuts. Faced with uncertainty, an analyst can replace uncertain cash flows with conservative or low ball estimates. Cash flow haircuts may have an intuitive appeal but they must be used carefully. Cash flows may be adjusted downward for risk that will be eliminated in a portfolio. The absence of transparency about risk adjustment may lead to double counting of risk when there are multiple layers of analysis.

DCF techniques are transparent and visible to others looking at the valuation. The models are explicit about the risks that are adjusted for and those which do not affect the discount rate. But the problem is that risk-and-return models make assumptions about how both markets and investors behave that are at odds with actual behaviors. Given the complicated relationship between investors and risk, we may not be able to capture the effects of risk fully into the discount rate or cash flow.

Post valuation risk adjustment

Assess the risk by valuing the investment as it is had no risk. Adjust the value for risk after the valuation. The common practice is to capture some of the risks in the risk adjusted discount rate and deal with the other risks in the post valuation phase as disorients & premiums. Sometimes a post valuation discount may make sense, to reflect lack of liquidity. A post valuation premium may be necessary if the expected cash flows do not fully capture the potential for large pay offs in some investments. Analysts valuing companies that are subject to regulation will sometimes discount the value for uncertainty about future regulatory changes. A discount may also be applied in the case of companies that are vulnerable to lawsuit.

Analysts may sometimes apply a control/premium. By controlling a firm, it may be possible to create more value than the current management. The value of control ill be larger in badly managed firms. Significant premium may be added to estimated value, to reflect potential synergies.

There are some problems with post valuation adjustments. There may be double counting of risks/upside. The magnitude of the discount/premium may be arbitrary or based on questionable evidence. Adjusting an estimated value with premiums/discounts may allow analysts to bring heir biases into the number.

Relative valuation approaches

The value of an asset is derived from the pricing of comparable assets, standardised using a common variable. Some assets may be comparable in terms of cash flows, risk and growth potential. While making comparisons, the market value must be divided by book value or revenues to arrive at an estimate of standardized value. Risk adjustments in relative valuation tend to be more ad hoc. DCF techniques need more data. If time or data is scarce, companies may use relative valuation. In relative valuation, we are far more dependent on markets beings right, at least on an average for the risk adjustment to work. We may be dependent on markets for some inputs in a DCF model but the assumption of market efficiency is less consequential.

Scenario analysis

Various steps are involved in scenario analysis:

- Determine the factors around which the scenarios will be built.
- Determine the number of scenarios to be analyzed for each factor
- Estimate the asset cash flows under each scenario.
- Assign probabilities to each scenario

The most useful information from scenario analysis is the range of values across different scenarios, which provides a snapshot of the riskiness of the asset. Scenario analysis can also be useful in determining the inputs into an analysis that have the most effect on value. The outlined scenarios must be realistic and cover the spectrum of possibilities. Scenario analysis is ideally suited for dealing with risk that takes the firm of discrete outcomes. Care must be taken to avoid double counting of risk.

Decision trees

This technique is useful when risk is not only discrete but also sequential. Decision trees help us to consider risk in stages and devise the right response to outcomes at each stage. The following steps are involved:

- Divide analysis into risk phases
- Estimate the probabilities of the outcomes in each phases
- Define decision points
- Compute cash flows/value at end nodes
- Fold back the tree

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By linking actions and choices to outcomes of uncertain events, decision trees encourage firms to consider how they should act under different circumstances. Firm will be better prepared to face uncertain outcomes. Because they provide a picture of how cash flows unfold over time, they are useful in deciding what risks should be protected against and the benefits of doing. Risks that affect an asset concurrently cannot be easily modeled in a decision tree.

Simulation

Simulations provide a way of examining the consequences of continuous risk. Simulations allow for more flexibility in the way we deal with uncertainty. The steps in simulation are:

- Determine probabilistic variable.
- Define probability distributions for these variables.
- Check for correlation across variables.
- Run the simulation.

Running a simulation is simplest for firms that consider the same kind of projects repeatedly. These firms can use their experience from similar projects that are already in operation to estimate expected values for new projects.

To use simulations as a tool in risk analysis, we have to introduce a constraints, which if violated, created vary large costs for the firm and perhaps even leads to its collapse. The effectiveness of risk hedging tools can be evaluated by the likelihood that the constraint will be violated with each one and weighing that against the cost of the tool. There are two types of restrictions on the book value of equity that may call for rest hedging:

- Regulatory capital restrictions.
- Negative book value or equity.

Constraints, some internally imposed and others externally. For example, managerial incentives may be related to cash flows (internal) while loan covenants may be related to cash flows (external). In DCF techniques, the value of the firm is based on going concern. The value of the firm is based on going concern. The costs of not being able to meet debt payments are only considered peripherally in the discount rate. By allowing us to compare the value of the business to its outstanding claims in all possible scenarios, simulations allow us not only to quantify the likelihood of distress but also building the impact of bankruptcy costs into valuation.

Simulations provide the most complete assessments of risk because they are based on probability distributions for each input. The output from simulation takes the form of an expected value across simulations and a distribution for the simulated values. For simulations to be effective, the distributions chosen for inputs should be based on data and careful analysis. A good understanding of statistical distributions is important. Real data may often not fit into statistical distributions. Shifts in market structure can lead to changes in distributions – either the form of the distribution or the parameters. Correlations among input variables may also change over time. Simulations generate expected cash flows. So we should use the risk adjusted discount rates. Simulations work best when substantial historical and cross sectional data are available. Comparing two assets with the same expected value (using risk free discount rate) from a simulation, we will pick the one with the lower variability in simulated values as the

better investment. This can be a pitfall. We must also consider the correlation between the risk of the asset and the risk of the remaining portfolio.

Value – at - Risk

In its most general form, VaR measures the potential loss in value of a risky asset or portfolio over a defined period for a given confidence interval. If VAR = $10 million for one week at a 90% confidence level, it means there is only a 10% chance that the value of the asset will drop by more than $10 million over any given week. The mathematics underlying VaR was largely developed by Harry Markowitz and others in the context of portfolio theory. The first regulatory measures that evoked VaR were initiated 1980 when the SEC tied the capital requirements of financial services firms to the losses that would be incurred with 95% confidence over a 30 day interval in different security classes. Around this time, the trading portfolios of investment firms were becoming larger and more volatile, creating a need for more sophisticated and timely risk control measures. By the early 1990s, many financial services firms had developed rudimentary measures of VaR with wide variations on how it was measured.

There are three ways to measure VaR:

- Variance / Covariance
- Historical simulations
- Monte Carlo simulation

Variance Covariance method

Take the assets in the portfolio and map the asset on the simpler, standardised instruments. Instead of trying to estimate the variances and co variances of thousands of individual assets, we estimate those statistics for the common market risk instruments that these assets are exposed to. Next, each financial asset is stated as a set of positions in the standrdised market instrument. The variances and co variances of these standardised instruments are estimated. The VaR of the portfolio is completed using the weights on the standardised instruments and the variances and co variances of these instruments.

The VaR of the portfolio is completed using the weights on the standardised instruments and the variances and co variances of these instruments. The calculation of VaR clearly involves assumptions about the way returns on the standardised measures are distributed. Normal distribution is a common assumption in many VaR calculations. There are three problems with the variance co variance approach:

- There are three problems with the variance co variance approach:
  - Wrong distributional assumption : If conditional returns are not normally distributed the computed VaR will understate the true VaR.
  - VaR estimate can be wrong if the variances and co variances that are used to estimate it, are incorrect.
  - There are problems, when variances and co variances across assets change over time.

Historical simulation

Here, the VaR is estimated by creating a hypothetical time series of returns on that portfolio, obtained by running the portfolio through actual historical data and computing the changes that would have occurred in each period. As in variance – Co variance method, we begin with the time series data on each market risk. But we do not use the data to estimate variances and co variances looking forward. The changes in portfolio over time yield all the information needed to compute VaR.

- There are problems with historical simulation:
  - The past may not represent the future
  - All data points are weighted equally. To the extent that there is a trend of increasing volatility even within the historical period, we will understate the VaR.
  - The method is not useful when new assets or market risks are encountered.

To deal with these limitations, the historical simulation approach has been modified in various ways:

- Past data are given more weight

- For assets where the recent volatility is higher than historical volatility, historical data can be adjusted to reflect that change.

Monte Carlo Simulation

We identify the market risks that affect the assets in the portfolio. We convert individual assets into positions in standardized instruments. We use simulation. We specify probability distributions for each of the market risk factors and specify how these factors move together. The power of Monte Carlo simulation comes from the freedom we have to pick alternative distributions for the variables. WE can also use our subjective judgments to modify these distributions. Unlike the variance-covariance approach, we need not make unrealistic assumptions about normality in returns. In contrast to historical simulation, we begin with historical data but are free to bring in both subjective judgments and other information to improve forecasted probability distributions. Monte Carlo simulations can be used to assess VaR for any type of portfolio and are flexible enough to cover options and option like securities.

Although Monte Carlo simulations are described as more sophisticated than historical simulations, historical data are frequently used to make assumptions about the distribution. As the number of market risk factors increases and their co movements become more complex, Monte Carlo simulations become different to run for two reasons. We have to estimate the probability distributions for hundreds of market risk variables rather than just a handful. The number of simulations needed to obtain reasonable estimates of VaR will have to increase substantially. One way to reduce the computation burden of running Monte Carlo simulations is to do the analysis over a number of discrete scenarios. Principal component analysis can be used to narrow the number of factors. Some scholars have suggested the use of approximations from the variance – co variance approach to guide the sampling process in Monte Carlo simulations.

If we are assuming VaR for portfolio that do not include options, over short periods (a day or a week), the variance – covariance approach does a reasonably good job. If Var is being computed for a risk source that is stable and where there is substantial historical data, historical simulations provide good estimates. If we are computing VaR for non linear portfolios over longer periods, where the historical data is more volatile and non stationary, and the normality assumption is questionable Monte Carlo simulations do best. Each VaR measure mistakes assumptions about return distributions, which if violated, can result in incorrect estimates of VaR. Firms that use VaR to measure risk exposure, are under prepared for large and potentially catastrophic events that are extremely unlikely in a normal distribution but seem to occur at regular intervals in the real world. Any VaR measure will be a function of the period over which the historical data is collected. If the period was a relatively stable one, the computed VaR will be a low number and will understate the risk looking forward. Conversely, if the period examined was volatile, the VaR will be set too high. VaR appeals to people because of its simplicity. But this simplicity comes from a narrow definition of risk. Firms that are excessively dependent on risk, can be lulled into a false sense of complacence. VaR focuses on market risk – Political risk, liquidity risk, regulatory risks are not built in.

VaR ignores the tails of the distribution. Managers who understand ho VaR is computed, can game the measure to report superior performance while exposing the firm to substantial risks. By not considering the magnitude of losses once we exceed the VaR cut off probability, (90% or 95%), we are opening ourselves to the possibility of very large losses in the worst case scenarios. Because VaR is generally measured using past data, traders and managers who are evaluated using the measure will have a reasonable understanding of its errors and can take advantage of them. There have been various modifications of VaR to deal with these limitations:

- VaR can be modified to accommodate multiple risk factors and compute component VaR by breaking down a firm's risk exposure to different market risks.
- Conditional VaR can be used. Conditional VaR is defined as the weighted average of VaR and losses exceeding VaR.
- Another option is to measure cash flow at risk. Often it is cash flows, not vale, that matters. Value may remain stable but cash flows may implement, putting the firms to risk.
- Earnings at risk and stock price at risk can also be measured.

How risk management creates value

Human beings are risk averse. The tools to assess risk have become more sophisticated but the risks we face have also multiplied and become more complex. What separates business success from failure is the capacity to be judicious about which risks to pass through to investors, which risks to avoid and which risks to exploit. About 75-80% of the risk in a publicly traded firm comes from firm specific factors. Hedging this risk involves a cost. The cost of equity may not decrease (it reflects market risk) while the cost of debt may decrease.

The proportion of debt that the firm can use to fund operations may expand because of the lower exposure to firm specific risk. The benefits of such hedging will be greatest for firms that are both highly levered and are perceived as having high default risk. For firm value to increase because of prudent risk hedging, the cost f capital has to decrease by enough to overcome the costs of risks hedging. This will happen only when the leverage is high.

A firm that reduces its exposure to market risk will see its cash flows reduce and its cost of debt decline. But the beta and the cost of equity will also decrease. If risk hedging products are priced fairly in the market place, the benefits will exactly offset the costs leading to no effect on value. If investors in companies are diversified, have long term horizons and care only about market risk, managers over manage risk. The only firms

that should be hedging risk should be bones that have substantial default risk and high debt or ones that have found a way to hedge market risk at below market prices.

The value of a firm can generally be considered a function of four key inputs:

- Cash flow from assets in place or investments already made
- Expected growth rate in cash flows during a period of high growth excess returns.
- Time before stable growth sets in and excess returns are eliminated.
- Discount rate which reflects both the risk of the investment and the financing mix used by the firm.

It is clear that a firm must do the following to increase its value:

- Generate more cash flows from existing assets
- Grow faster or more efficiently during the high growth phase.
- Long than the high growth phase
- Lower the cost of capital.

Hedging can smoothen cash flows, reduce taxes and thus improve operating margins. Growth depends on the reinvestment rate and the return on capital. Managers often under invest because of risk aversions. If we can give mangers the tools for managing and reducing the exposure to firm specific risk we can remove the disincentive that prevents them from investing. The pay off from risk hedging must be greater for firms with weak corporate governance structures and managers with long tenure. Providing protection against firm specific risks may help align the interest of stockholders and mangers and lead to higher firm value. By hedging and smoothening earnings, firms can extend their high growth/excess returns period. This argument is especially valid in markets where the access to capital is severely constrained.

The way the firm strategically manages its risk exposure, such as by making the right R&D investments, will clearly help in extending the growth phase. The pay off from risk management must be greater in businesses that are volatile but earn high returns on investment. There must be unpredictable, but lucrative investment opportunities. Does the market reward companies that hedge or manage risk? The evidence from a sample of gold mining companies does not substantiate this. But it may be difficult to generalise. Whether the benefits of hedging exceed the costs, is probably more firm specific. Risk hedging is essentially the equivalent of buying a put option against specific eventualities while risk management gives firms the equivalent of a call option. A firm with a valuation of $100 million that buys hedging products to ensure that the value does not go below &80 million, is effectively buying a put option where the underling is the unhedged value of the firm's assets and the strike price is the lower bound on the value.

Risk management focuses on taking advantage of the upside created by uncertainty. So it is like a call option. Risk management is most likely to generate value of firms that

operate in volatile business with substantial barriers to entry. Risk hedging is most likely to generate value for smaller, closely held firms or for firms with substantial debt and distress costs. It is most likely to create value when it is focused on hedging risks that investors cannot protect themselves against through market traded securities. The increase in value will come from a lower cost of capital. Moreover, mangers may be more willing to invest in high risk high growth projects. Risk hedging is unlikely to create value in case of firms owned by widely diversified investors and those focused on risk where market protection is easy to obtain. Risk management is aimed at generating higher and more sustainable excess returns. The benefits of risk management will be greatest in business with high volatility and strong barriers to entry. The greater the range of firm specific risks, the greater the potential for risk management. Risk management will create more value if new entrants can be kept out of business.

	Risk Hedging	*Risk Management*
View of risk	Risk is a danger	Risk is a danger & an opportunity
Objective	Protect against the downside	Exploit the upside
Approach	Financial, Product oriented	Strategy/ cross functional process oriented
Measure of success	Reduce volatility in earnings, cash flows, value	Higher value
Type of real option	Put	Call
Primary impact on value	Lower discount rate	Higher & sustainable excess returns
Ideal situation	Closely held, private firms, publicly traded firms with high financial leverage or distress costs	Volatile businesses with significant potential for excess returns

To hedge or not to hedge

We must hedge when the benefits of hedging exceed the cots. There is a cost associated with hedging. Sometimes it is explicit, as in the case of insurance. At other times as in the case of forwards and futures, the cots are implicit. Explicit costs reduce earnings in the period in which the protection is acquired. Implicit costs manifest themselves indirectly only in future earnings. There are five reasons for hedging:

Tax benefits

There are two sources of tax benefits. One flows from the smoothing of earnings. The other is the result of the tax treatment of hedging expenses and benefits. There will be tax benefits to hedging if the cost of hedging is fully tax deductible but the benefits from insurance are not fully taxed.

Better investment decisions

Managers, because their compensation is linked to certain performance. Measures may reject investments that create value for ht firm. Firms that hedge against risk are more likely to have stable earnings/operating cash flows and are thus less likely to face unexpected cash shortfalls. So they are less dependent on capital markets and can stick with long term capital investment plans and increase value.

Distress costs

Given the large costs of bankruptcy, firms hedge risks that are large relative to the size of the firm. The pay offs from lower distress costs show up in two ways. One is in the form of a lower cost of capital. Firms that have borrowed money and are exposed to significant operating risk are better candidates for risk hedging. Risk hedging can actually reduce value at low debt rations because any gains from reducing distress costs are likely to be small and overwhelmed by the costs of hedging. In contrast, hedging can increase firm value for firms that are optimally levered and thus carry significant debt loads with concurrent distress costs.

Informational benefits

Hedging away risks unrelated to the core business of the firms can also make financial statements more informative and investors may reward the firm with a higher value. People will be convinced that earnings reflect the operating performance of the firm. Hedging will add value only if the cost of hedging is lower to the firm than to investors. For example diversification by acquisitions may not create value as it may be easier for investors to hold la diversified portfolio.

Investment Choices

Some of the risk that a firm is exposed to, is mitigated by the investment decisions that it makes. For example, a firm can set up multiple plants to minimise the risk of plant breakdown and production disruption. Firms can also shape their overall risk exposure through their financing choices. In general, they can do this by matching the characteristics of debt to the assets funded with the debt. One of the oldest and most established ways to protect against risk is to buy insurance to cover specific event risk. Insurance is more effective against individual or firm specific risks that affect a few and leave the majority untouched and less effective against market risk. Insurance is more effective against large as opposed to smaller risks. An entity can self insure against small risks and hope that the averaging process works over time. Insurance is more effective against event risks than against continuers risk. Derivatives can also be used to

hedge risk. Forward contracts provide the most complete hedging but can be used only if the firm knows its future cash flow needs. Futures contracts are more assessable as they are standardised and traded on exchanges. But they also do not provide complete protection. Options provide protection against downside risk while preserving the upside potential

Gaining competitive advantage

Risk exposes us to potential losses. But it also provides us with opportunities. A simple vision of successful risk taking is that we should expand our exposure to upside risk while reducing the potential for downside risk. Cash flows from existing investments reflect the company's risk exposure. A risk averse company will have fewer investments and report lower cash flows from those investments. The excess returns on new investments and the length of the high growth period will be directly affected by decisions on how much risk to take in new investments and how well risk is assessed and dealt with. Increased exposure to market risk will lead to higher cost of capital. Higher firm specific risk will have little impact on the cost of capital especially for firms with diversified investors. There is a positive pay off to risk taking but not if it is reckless. Firms that are selective about the risks they take can exploit these risks to their advantage but firms that take risks without sufficiently preparing for their consequences can be hurt badly.

Information advantage: Firms that take risk must invest in superior information networks. Companies must be clear about the kind of information needed for decision making in a crisis and invest in the necessary hardware and software to ensure that this information can be accessed in a timely fashion. Early warning information systems must trigger alerts and preset responses.

The Speed advantage: The speed of response can be critical in a crisis. Speed depends on the quality of information, understanding the potential consequences and the interests of the stakeholders. Organizational structure and culture also determine the speed of response.

The experience/knowledge advantage: Having experienced similar crises in the past can give us an advantage. Firms must invest in learning. They can enter new and unfamiliar markets, expose themselves to risk and learn from mistakes. They can acquire firms in unfamiliar markets. They can form strategic alliances or poach people with the necessary expertise.

The resource advantage: Having the resources to deal with crisis can give a company a significant advantage over competitors.

Flexibility : - A flexible response to changing circumstances can be a generic advantage. For some firms, flexibility may come from production facilities that can be modified at short notice to produce modified products that better fit customer demand. For others, flexibility may come from lower overheads/fixed costs. Flexibility also mean the ability

to get rid of past baggage, cannibalising existing product lines and having a “paranoid” culture.

Building the risk taking organization

Corporate governance: Interests of decision makers must be aligned with those of the owners. Both manger with too little wealth and too much wealth tied up in their business will not take risk. The appropriate corporate governance structure for the risk taking firms would call for decision makers to be invested in the equity of the firm but also to be diversified. The venture capital and private equity investors who provide equity to start up come closest in this regard. They invest significant amounts in thigh growth high risk businesses but they spread their bets across multiple investments, thus generating diversification benefits.

People: When facing a crisis, some people panic, others freeze but a few thrive and become better decision makers. Firms must hire people who keep a cool head in crises.

Reward / Punishment Mechanisms: A good compensation system must consider both process and results. A trader w h o is carefully about keeping an inventory of risks taken and the rationale for taking these must be treated more favourably than one with chaotic trading practices and little or no explanations for trading strategies used, even if the latter is more successful.

Organization size/structure/culture: Optimally, we must encourage the risk taking behaviour of small firms with the defensive capabilities of lager ones. Flatter organizations tend to be better than more hierarchical organizations in handling information and responding quickly. Where risk must be dealt with on a continues basis, lines between different functions must be less firmly drawn. Culture is also important. A key factor is the way a firm deals with failure rather than success. Tolerance towards failure is important, to encourage risk taking.

Conclusion

Damodaran has summarized the key principles underlying risk management.

Risk is everywhere: Our biggest risks will come from places that we least expect them to come from and in forms that we did not anticipate that they would take. Companies should be able to deal with unexpected risks.

Risk is threat and opportunity: Good risk management is about striking the right balance between seeking out an avoiding risk.

We are ambivalent about risks and not always national: A risk management system is only as good as the people manning it.

Not all risk is created equal: Different risks have different implications. Different stakeholders view risks in different ways. So the right perspective on risk is important.

Risk can be measured: The debate should be about what tools to use to assess risk than whether they can be assessed.

Good risk measurement: assessment should lead to better decisions. If risk assessment and decisions are made by different entities, each one has to be aware of the other's requirements and preferences. The risk assessment tools must be built around the risks that matter, than all risks. A good risk assessment will focus on the downside as well as the upside.

The key to good risk management is deciding which risks to avoid, which ones to pass through and which to exploit. Risk hedging is only a small part of risk management. The pay off to better risk management is higher value. To mange risk right, we must understand the levers that determine the value of a business. Risk management is part of everyone's job. Managing risks well is the essence of good business practice and is everyone's responsibility. Successful risk taking organizations do not get there by accident. The risk management philosophy must be embedded in the company's structure and culture. Aligning the interests of mangers and owners, good and timely information solid analysis, flexibility and good people are they key building block of a successful risk taking organization.

Risk management as a discipline has evolved unevenly across different functional areas. In finance, the preoccupation has been with discount rates. Little attention has been paid to the upside. In strategy, the focus has been on competitive advantage and barriers to entry. Risk management at most organizations is splintered with little communication between those who assess risk and those who make decisions based on those risk assessments. The chasm between the different functional areas – finance, strategy, operations – needs to be bridged. Indeed, good risk management lies at the heart of a successful businesses.