Chapter 7
Risk Treatment

We can describe risk treatment as a complex activity aimed at modifying and/or mitigating risks and the potential economic and financial impact of such risks through risk control and risk financing actions.

As we drill down further we can define risk control as acting on the two main factors or risk, i.e., frequency and severity. In parallel we add the definition of risk financing: mitigating the economic and/or financial effects of risks so that, if an event has indeed occurred, the economic and/or financial consequences of the loss are reduced (Dionne 2000, Haefeli and Liedtke 2012).

Hence, risk treatment (control and financing) encompasses all the options available for treating those risks which are considered as intolerable during the phase of risk assessment. A further definition of risk treatment is provided by ISO 31000 and is described here below.

> ISO 31000 (2009). 5.5.1. Risk treatment
> Risk treatment involves selecting one or more options for modifying risks and implementing those options. Once implemented, treatments provide or modify the controls.

The treatment options are identified in Fig. 7.1.

7.1 Risk Control

Risk Control aims at reducing the frequency and severity of losses and making losses more predictable. Risk control is particularly suitable for treating unforeseen and fortuitous losses. It is therefore the main objective of the previously mentioned risk control actions to protect human and organizational resources, subject to these losses.

We can look at these options in more detail below:

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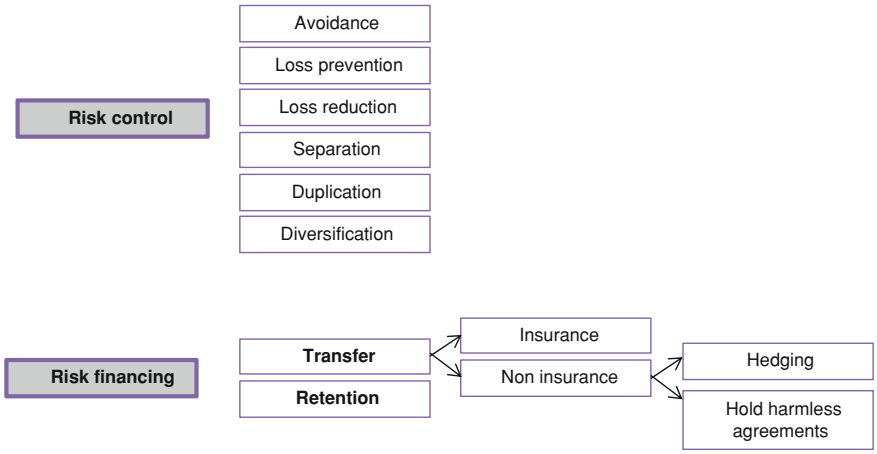

Fig. 7.1 Risk treatment options

7.1.1 Avoidance

This option represents the decision not to undertake, when practicable, the activity that contains an intolerable risk. It means that management will choose an alternative that is either a different more tolerable approach to completing the required activity or different and less risky methodology or process within the activity.

There is the option of adopting an alternative work practice of lower risk that may reduce the consequences and/or likelihood of harm or loss but this would not necessarily be avoidance of risk. Avoiding the risk is equivalent to refusing to accept the risk e.g., transferring the risk to a third party, a different process utilizing different processes and procedures, etc.

7.1.2 Loss Prevention

This technique aims at reducing the frequency of a particular loss.

For example we can reduce the probability of a fire hazard by adopting construction techniques with materials that have a high level of fire resistance (risk prevention). Another approach to loss prevention and therefore reduction of loss frequency arising from third-party liability on products is through the introduction of quality control systems. Still another consideration aimed at reducing work-related injuries is the adoption of technical devices that are designed to prevent hazardous actions by machine operators. Of course staff training, regularly updated safety and awareness programs are an integral part of any successful loss prevention program.

7.1.3 Loss Reduction

This technique aims at reducing the severity of loss. It is noted that severity minimization techniques come into play while the loss event is occurring. Examples are fire doors closing or the activation of a sprinkler or fire suppression system which prevent a fire from spreading in a building.

Before installing and activating any technical loss prevention system it is advisable to complete a cost/benefit analysis. It should be clearly quantifiable that the economic benefits stemming from such actions (reducing the potential impact of a loss) are favorable. Convenience is reached only when the economic benefit is greater than the cost of risk treatment actions.

7.1.4 Separation, Duplication, Diversification

Separation is a risk control technique that aims at "separating" and dispersing a particular asset or activity among different locations.

Duplication is based on backups, spares, or copies of critical property, information, or capabilities and keeps them in reserve.

Diversification typically spreads loss exposures over numerous projects, products, markets, or regions thereby reducing the impact of a loss on an organization from a loss at a single location (significant reduction of critical assets at any one location).

Again the aim of these techniques—especially separation—is to prevent the concentration of goods, people, or business in a single location, market, or individual project. These methods typically act on the severity of risk. It is obvious that if goods, business, or people are highly concentrated, the Maximum Probable Loss surges to a greater level.

Usually implementing a risk control method involving separation means physical separation e.g., geographically. This said separation can also involve temporal separation, which entails planning that aims at preventing that goods, people, or business are concentrated in the same location at the same time. For instance, by preventing several hazardous activities from being performed simultaneously or through the coordination of arrivals and departures of goods or people to and from the facility by providing a reasonable time gap between each phase of production will reduce the likelihood of a loss.

Risk control techniques should be selected and combined on the basis of a careful evaluation of costs and savings resulting from those decisions.

Costs and savings are broken down into direct and indirect costs and savings.

Direct costs resulting from the use of risk control techniques are in turn broken down into investment costs and operating costs. The former consist in the amount of capital required to purchase loss control equipment or modify subject machinery, plant, or buildings. The latter are basically costs incurred to implement

Table 7.1 Costs and savings of risk control techniques

	Direct	Indirect
Costs	Investment costs for:	Reduced production:
	(a) purchase of control systems and devices	(a) temporary
	(b) facilities modification	(b) final
Savings/ benefits	Reduction of insurance costs	Risk abatement for non-insurable events
	Incentives for general investments	Risk abatement for uninsured events
	Incentives for investments in safety	Improvement in:
		(a) productivity
		(b) supply chain relationships
		(c) public relations

control devices and safety systems and keep them in good working order. Also to be considered are labor costs for fire-fighting and first aid teams and costs of regularly conducted safety training courses for the staff.

On the other hand, direct savings consist in the abatement of insurance costs as well as obtaining any government or local incentives for general investments or specific investments in safety and prevention.

Conversely, indirect costs include costs associated with production downtimes due to the time required to install control devices or systems or a reduction of production resulting from an ongoing interference by such control systems.

Finally, indirect savings include the savings associated with the abatement of the frequency and/or severity of a potentially detrimental event, due to the introduction of control measures. The indirect savings can be significant particularly for non-insurable events or those events which, albeit insurable, are only partially covered by insurance. Noteworthy among indirect savings are those that can be achieved by the improvement of the corporate image, industrial relations, and public relations (see Table 7.1).

7.2 Risk Financing

Risk financing represents a set of acts and decisions generating the funds to pay for losses or offset the volatility in cash flows that may occur from loss. Risk financing techniques are most commonly referred to as *retention* and *transfer*.

The strategic goal of risk financing techniques is to maintain the appropriate level of liquidity, managing the uncertainty resulting from loss outcome, and hence managing the total cost of risk. Another strategic goal of Risk Financing is to be compliant with legal requirements (Haimes 1998, Harrington 1999, Rothschild and Stiglitz 1976).

7.3 Risk Financing: Retention

This technique aims at absorbing the loss by generating funds within the organization to pay for the loss.

Retention can be represented as the voluntary or active assumption of a loss exposure that has been identified and analyzed (planned retention). In these cases, this planned retention is chosen for the purpose of cost-effectiveness or convenience.

In other cases, there could be an unplanned retention, which is the inadvertent or passive assumption of a loss and its consequence, either direct or indirect, because the loss exposure had not been identified or accurately analyzed.

7.3.1 Retention: Take a Proper Decision!

Active risk retention is generally linked to at least one of the following conditions:

1. Impossibility to transfer or eliminate risk. This may occur, for instance, when no insurer accepts to insure the risk, while its elimination would entail winding up the business.
2. Excessive transfer costs. This may occur if the frequency and/or severity of the event, as calculated by the insurer are significantly higher than that reasonably expected by the company based on past experiences and therefore the relevant premium is deemed too high. Alternatively, one may find the insurer is prepared to take on the risk but only subject to certain prevention and/or abatement measures being implemented. These measures can be quite costly and may be deemed to be too high.
3. Very low probability of the event occurring, to the extent of being assumed in its totality.
4. Very high probability of the event occurring. In this case it is obvious that, in the presence of an essentially certain event, an insurer, albeit prepared to take on the risk, would demand a premium at least equal to, but often higher than, the Maximum Probable Loss.
5. Highly reliable risk measurement. This situation may arise only when the company holds the control over a large number of consistent and independent risk units, so that its forecasting capacity is highly effective.

The existence of one of the conditions listed above is a necessary, albeit not uniquely sufficient, condition for retention to be recommended as a risk treatment technique. Indeed, further factors need to be carefully considered before making final decisions regarding retention, including:

1. Savings on operating costs and insurer's profits. Risk retention rather than insurance transfer has the advantage of saving on the mark-up that the insurer must add to the pure premium to cover their acquisition (commissions and

Table 7.2 Evaluation of the alternative between retention or transfer

Retention or transfer?	
Necessary conditions	Costs and savings
Impossibility to transfer or eliminate risk	Savings from premium mark-up
Excessive transfer costs	Differential savings from the rate of external and in-house corporate premium
	Disbursement actualization for premiums and temporal sequence of losses
Very low probability event	Influence of taxation
Very high probability event	Additional loss management costs
High reliability in measuring risk	

general sales expenses) and management costs as well as profits related to the assumption of the risk.

2. The savings between the loss expected by the insurer and the loss measured by the company. This occurs whenever the pure premium rate as calculated by the insurer exceeds the premium expected by the company based on past experiences.
3. The financial effect associated with the different time sequence of insurance premium payments compared to the losses projected to occur in the future.
4. The effect on taxation. The retention choice creates consequences on the yearly amount of income tax payable that are not easily foreseeable. Indeed, unlike insurance transfer whose cost, which is equal to the premium paid and is a tax deduction, tends to be evenly distributed over time, the losses incurred with the retention, albeit tax deductible, may not be as regular. This makes tax planning quite difficult.
5. Additional loss management costs. The retention of certain risk categories (especially third-party liability or workers compensation risks) requires the company to implement and manage a broad range of operations and services, including claim handling. This will entail the creation of a structure which, albeit on a smaller scale, reflects the structure of the typical insurance company. This will result in a series of ongoing costs to be considered at the time the decision is made.

The factors to be considered at the time of assessing the alternative between retention and insurance transfer are summarized in Table 7.2.

Therefore, retention is linked to a careful financial planning in order to control future losses. It is essential that the following factors can be taken into account:

- Ability to estimate costs with reasonable reliability. Indeed, when risks are treated by way of insurance transfer their cost can be easily determined as it is expressed by the premium paid. Conversely, when they are retained, there is the danger that they are not as easily assessed.

- Stabilization of economic results. The lack of financial planning for losses would make economic results highly volatile, as they would be linked to the occurrence or otherwise of unfavorable events. This volatility can, in turn, result in damaging consequences.
- Minimization of business interruption. The arrangement of ways to finance losses for retained risks is also required by the need to restrict, as much as possible, business interruption. Where this is lacking, the need to put in place impromptu intervention creates the premise for a possible delay in implementing recovery operations.

The methods that can be adopted to finance retention programs are many, and below we shall describe what can be considered best practice in this regard.

7.3.2 Asset Reduction

While considered an atypical way of financing retained risks, as it simply consists in accepting the asset reduction caused by the occurrence of the event even if this means winding up the business or a particular production line. Although at first glance it may seem simplistic, this method, if the result of a proper consideration of the situation is an effective means of retention. For example, whenever the cost for repairing or replacing the destroyed or damaged asset is so high as to make the continuation of production anti-economical. It is also possible to choose insurance transfer based on the replacement cost for the asset rather than its current value: however, this choice entails a significant hike in the premium, which may be considered excessive in relation to the cost effectiveness of the management.

Therefore, a choice could be made not to set aside resources to finance losses linked to risk retention when:

- the cost to repair or replace the asset is deemed greater than the profitability that can be expected from it;
- the total or partial loss of the asset does not affect in a material way the continuation of the business, i.e. when its contribution to the company's profitability is nil or close to nil.

7.3.3 Absorption into the Operating Costs

A relatively simple method of financing risks, in relation to which retention has been adopted, is to take into account predicted losses at the time of the financial planning of operations. In other words, when we develop operational budgets,

these will need to include the forecast of costs for losses arising from retained events.

This choice is strictly linked to the degree of sophistication and success in predicting losses. This restricts the use of such a technique essentially to events which are prone to create frequent and small losses. In these cases, as properly observed, in addition to the general advantages of retention there is the advantage of bringing such costs under the control of cost center managers in the same way as any other operational expense for the business.

7.3.4 Self-insurance (Self-insured Retention)

The financing of losses through their prediction and absorption into operating costs is feasible provided the events meet all the criteria of predictability and manageability. As mentioned previously these are usually loss that are predicability frequent but small. In case of events that are prone to less predictability and wider fluctuations in value the alternative to insurance transfer requires that the company become, on a small scale, an insurer. Seen under this light, self-insurance may be described as a financial plan whereby through yearly allocations the company creates a fund which, managed with more or less the same criteria applied by an insurer, allows the handling of losses as they fluctuate.

In addition to the above, further benefits that may be derived from self-insurance are:

- a strong incentive to perform in a more efficient manner the business typical of an insurer for its own account;
- the greater flexibility made possible by a self-insurance plan in treating risk, in the sense that insurance contracts often contain restrictive clauses for the insured;
- the improvement of physical control activities resulting from an in-house plan and where the use of an external insurer may amount to a disincentive;
- the improvement of claim payouts when losses do occur. As there are no conflicts of interest the time required to recover the losses, compared to the claim payout process of a normal insurer, are significantly reduced.

While there are many potential benefits the adoption of a self-insurance plan also has a range of limitations that should be considered when making a decision. Such limitations include:

- an insufficient number of consistent and independent risk units. In this case, the loss prediction is unreliable and in turn results in errors in calculating the yearly allocations;
- inefficiencies in managing the self-insurance plan also linked to inexperience compared to a third-party insurance company.

The difficulty in predicating tax deductibility of the yearly allocations and the subsequent effects on annual tax planning.

7.3.5 How Should Reserves be Allocated?

An issue that emerges in all self-insurance plans concerns the allocation of yearly reserves: i.e., whether they should be linked or otherwise connected to investments in assets which can be readily disposed of.

Obviously, it is necessary, when developing a financial plan, to predict the maintenance of the overall liquidity situation which is also compatible with the requirements of the self-insurance plan.

This means that the reserve to be allocated yearly should be greater than the mere distribution of losses expected in the long term and therefore will have a dual component: (a) capital invested to cover atypical fluctuations; (b) yearly premium relating to a medium expected loss.

A general and relatively simplified method to determine the size of the reserve to be allocated and assess the choice between insurance transfer and self-insurance is the comparison between the company's financial situation at the beginning and the end of the financial year, both when resorting to insurance transfer and when adopting a self-insurance plan.

The final financial position, in case of insurance transfer, is equal to the initial net capital less the insurance premium to be paid plus the company's in-house profitability on the residual invested capital, according to the following formula:

$$\mathrm{FPwi} = \mathrm{iNC} - \mathrm{IF} + r(\mathrm{iCN} - \mathrm{FPwi})$$

where FPwi = final position with insurance; iNC = initial net capital; IF = insurance fee; r = in-house company's profitability rate.

Where a self-insurance plan is chosen, the final position will be equal to the initial net capital less the medium loss expected for the year plus the company's in-house profitability on the residual invested capital (less the reserves allocated for self-insurance) and further increased by the profitability resulting from the investment of the self-insurance reserves, according to the following formula:

$$\mathrm{FPwsi} = \mathrm{iCN} - \mathrm{L}/2 - + - r(\mathrm{iCN} - \mathrm{L}/2 - R) + \mathrm{i}R$$

where FPwai = final position with self-insurance; L/2 = medium expected loss; R = reserves allocated as per the self-insurance plan; i = profitability rate resulting from the investment of the funds.

According to this model we should resort to insurance transfer whenever

$$\mathrm{FPwi} > \mathrm{FPwsi}.$$

A further simplification of the model may be achieved by indicating with D the difference between the two final positions (with insurance and self-insurance), i.e.

$$D = \text{FPwi} - \text{FPwsi}.$$

If this formula is used, insurance transfer should be chosen whenever D has positive values.

In considering this model (that however does not take into account the effects of taxation) it should be stressed that it is based on the provision that the funds allocated are invested in assets that can easily be disposed of and that the yield from such financial investments is in any case lower than the in-house company profitability rate. This is not always in all cases a realistic scenario.

7.3.6 Reserve Funds

Another method of financing losses resulting from retained risks is the use of generic reserve funds, to be used when the event occurs. Unlike self-insurance, in this case there does not exist an accurate and strict yearly reserve appropriation plan based on the distribution of the losses of the risk being considered. Every year, especially in the years with favorable economic results, and irrespective of the size of the predicted losses, generic and indistinct reserves are allocated.

The use of reserve funds as a method for ensuring the financial control of losses has at least three contra indications:

1. In the year in which the loss has occurred and the reserve funds have been used wholly or partially to cover it, there is the concrete danger of not having such reserves available for alternative investment opportunities that were to arise unexpectedly.
2. Major problems may arise in the company liquidity. If, indeed, the reserves have been invested in assets that are marginally liquid or that are hard to dispose of, should a loss causing event occur, there will be the need to sell in a short period of time nonliquid assets in order to handle the unexpected situation. This may result in capital losses at the time of their disposal.
3. The resulting loss may be so serious and significant that the available resources in the form of reserves may not be sufficient to cover the loss and to continue the company business.

7.3.7 Contingent Credit Lines

An alternative and to some extent innovative way of providing financial control over the losses is the establishment of contingent credit lines to be used only when the loss does occur.

Resorting to this method, as an alternative, for example, to insurance transfer, may be justified by a gap, which has occurred in recent years, between the percentile increments of the insurance premiums in many sectors and the trend of the cost of money. In some cases we have seen that the financing of losses through contingent capital may be less-expensive than the payment of an insurance premium over many years.

Organizations usually select a partial retention, regarding only a portion of the cost of any loss, instead of retaining the full cost of any loss. The capability to select properly the portion and nature of costs to be retained represent a key driver for an effective balance between retention and transfer.

7.4 Risk Financing: Transfer

Transfer comprehends insurance and non-insurance techniques that transfer the financial consequences of certain specified loss to another party.

Insurance is a risk financing technique that transfers the potential financial consequences of a certain specified loss from the insured to the insurer.

The goal is to transfer risks to a large group which agrees to share the financial losses in exchange for premium payments. The purpose of insurance is to spread the hazard risk among many who have similar risks.

The typical insurable risk is a pure risk, measurable and definite in terms of time, cause, and location, typically accidental, unintended, and unintentional.

Moreover, an insurable risk should be:

- homogenous, meaning similar, if losses are similar it means that they respond to similar causes of loss, this will improve predictability;
- independent and not catastrophic, meaning that only a small percentage of insureds will face a loss at any one time, so the premium of the many will pay the loss of the few unfortunate. Losses should not be catastrophic otherwise the financial stability of the insurer will be seriously challenged;
- affordable, meaning that the insurance makes good economic sense to purchase it.

Noninsurance is a risk financing technique that transfers all or part of the financial loss consequences to another party, other than an insurer.

Typically, there are two methods:

1. transfer through the abandonment or sale of an asset: in this case the risk is permanently transferred along with the asset;
2. contractual transfer: a risk, quite often the third-party liability risk, is transferred to a counterparty in the relevant contract.

Contractual transfer is a risk financing technique whose aim is to create such conditions so that upon the unfavorable event occurring, the company may have

legal recourse against a third party to cover the losses incurred. The two main cases are recoupment and bonds/security.

Contractual transfer may take place by either a negative transfer, i.e., striking out existing clauses which make the company responsible for the consequences of the risk, or a positive transfer, i.e., by inserting clauses that penalize the other party. Examples of contractual transfer in sale contracts are the mercantile clauses such as "ex works" or, in case of ocean cargo "fob" (free on board) when dealing with customers and "free at destination" when dealing with suppliers. Or, when dealing with one's own customers, by inserting clauses that aim at ruling out any company's third-party liability for any damage resulting from the use of the product.

The transfer techniques for abandonment should be kept separate from those for avoidance and elimination because they do not alter the frequency and severity of the unfavorable event, which continues to exist, albeit borne by others.

Among the typical types of insurance there are:

1. Property
2. Business income
3. General Liability
4. Workers' compensation and employers' liability
5. Motor vehicle
6. Employers' liability
7. Flood
8. Directors' and officers' liability.

7.4.1 Property

First-party insurance indemnifies the owner or user of property for its loss, or the loss of its income-producing ability, when the loss or damage is caused by a covered peril, such as fire or explosion. Accordingly, property insurance encompasses inland marine, boiler and machinery, and crime insurance, as well as what was once known as fire insurance, now simply called property insurance: insurance on buildings and their contents.

A commercial property policy consists of: one or more coverage forms; one or more causes of loss forms; the commercial property conditions form; and the common policy conditions form. The most widely used commercial property coverage forms are the building and personal property coverage form and the business income and extra expense coverage form.

In the "Named Perils form", the property insurance term refers to policies that provide coverage only for loss caused by the perils specifically listed as covered. It contrasts with all risks coverage, which applies to loss from all causes not specifically listed as excluded.

Coverage is provided against perils like fire, lightning, explosion, smoke, windstorm, hail, riot, civil commotion, aircraft, vehicles, vandalism, sprinkler leakage, sinkhole collapse, and volcanic action.

In the broad form, coverage is ensured against additional perils, like falling objects; weight of snow, ice, or sleet; water damage (in the form of leakage from appliances); and collapse due to specified causes.

In the "All risk form", property insurance covering losses arising from any fortuitous cause except those that are specifically excluded. This is in contrast with named perils coverage which applies only to loss arising from causes that are listed as covered.

A particularly crucial issue when dealing with insurance transfer of the risk is the setting of the value of the insured assets. This because, as is well-known, in calculating the compensation, the so-called proportional rule is applied, whereby the compensation is equal to the damage multiplied by a coefficient resulting from the ratio between the insured value of the asset and its actual value at the time of the damage, i.e.,

$$I = \mathrm{VA}/\mathrm{VE}.\ \mathrm{D} \quad (\text{compensation} = \text{insured value}/\text{actual value}/\text{damage})$$

where I = compensation; VA = insured value; VE = actual value; D = damage.

According to the general conditions, once the damage has occurred, the actual value is determined based on the restoration cost net of depreciation (taking into account age, state of maintenance, building technique, location, destination, and so forth). However, it is possible to waive such assessment criteria by putting a "new for old" clause in, whereby the actual value is calculated without deducting depreciation. It is also possible to obtain compensation based on the replacement cost at the time of the loss (subject to an additional premium).

The use of the proportional rule upon the disposal of the asset may be an extra reason why the company places special focus on ensuring that the insured values are very close to the actual values and are continuously updated. The issue of a different assessment of the assets before and after the accident may be overcome by resorting to the so-called preventive estimation. This estimation, to be performed by a party independent to both the insured and the insurer and accepted by both parties, allows for the elimination of the proportional rule. The cost of the estimation, which can be quite high, is borne by the insured and the estimation should be performed on a regular basis e.g., annually or bi-annually.

7.4.2 Business Income

Business income insurance is usually included within the property insurance policy and covers loss of income, suffered by a business, when damage to its premises, equipment, or contents by a covered cause of loss, causes a slowdown or

Fig. 7.2 The insurance liability

suspension of its operations during the time required to repair or replace the damaged property, equipment, and contents.

There are two business income coverage forms:

- the business income and extra expense coverage form;
- or the business income coverage form without extra expense.

7.4.3 General Liability

General liability or third-party liability insurance protects a commercial insured from most liability exposures other than motor vehicle and professional liability.

7.4.3.1 Commercial General Liability

This is a standard insurance policy issued to business organizations to protect them against liability claims for bodily injury and property damage arising from premises, operations, products, and completed operations and personal injury liability.

7.4.3.2 Umbrella Liability

This is a policy designed to provide protection against catastrophic losses. It is generally written to provide higher limits over the various primary liability policies including business motor vehicle policy, commercial general liability (CGL) policy, watercraft and aircraft liability policies, and employers' liability coverage. The umbrella policy has three purposes: it provides excess limits when the limits of underlying liability policies are exhausted by the payment of claims; it drops down and picks up where the underlying policy leaves off when the aggregate limit of the underlying policy in question is exhausted by the payment of claims; and it provides protection against some claims not covered by the underlying policies, subject to the assumption, by the named insured, of a self-insured retention (Fig. 7.2).

This insurance coverage is effective for providing additional limits above the per-occurrence limits of the insured's underlying liability coverage. This "umbrella" can be adopted for the purpose of covering some losses that the underlying insurance does not cover and can take place when the underlying aggregate limits are exhausted.

7.4.4 Workers' Compensation

The Workers' Compensation Insurance policy provides indemnification and rehabilitation expenses to an employee for a work-related injury (including fatalities).

7.4.5 Motor Vehicle Liability

This insurance policy will cover bodily injury and property damage that the policy holder causes while operating a vehicle.

7.4.6 Employers' Liability

This coverage provided by this policy is typically provided by endorsement to the basic workers' compensation policy and pays on behalf of the insured (employer) all sums that the insured shall become legally obligated to pay as damages because of bodily injury by accident or disease suffered by any employee of the insured arising from and during his employment by the insured.

7.4.7 Flood

Provides coverage for damage to property caused by flood. It may be available either as standalone coverage or as an endorsement to almost any property insurance policy. Normally, the coverage provided is subject to a per occurrence sub-limit, an annual aggregate limit, and a separate deductible.

7.4.8 Directors' and Officers' Liability

This coverage operates for corporate Directors and Officers (D&O) against claims, very often by stockholders and employees, alleging financial loss arising from

mismanagement. D&O forms are written on a claims-made basis, generally contain no explicit duty to defend the insured, and exclude intentional/dishonest acts and bodily injury and property damage.

7.4.9 Take Care in Evaluating the Insurance Cost!

The criteria affecting the level of funding for treating risks should be established at the outset of the risk management process as part of the strategic, organizational, and risk management.

The strategic goal is to find an effective and efficient combination of actions that allow the organization to proactively face Risks, controlling the Total Cost of Risk.

For these reasons the true cost of insurance needs to be considered very carefully.

The yearly insurance spend should be compared with the median expected loss as determined when calculating the risk. If, based on early approximation, the values thus achieved seem similar, the cost of the insurance transfer would be nil.

We should not forget, however, that to the insurance fee we need to add the costs covering the additional services provided by the insurer, such as claim payouts or any insurance consultancy fees for physically controlling the risk.

Of course, an in-depth examination of this comparison requires the consideration of the distribution of losses over time, especially as regards their extent. If this is possible, the comparison should be made between the value of the losses and the value of the premiums paid annually in advance.

As regards the limitations pertaining to the insurance transfer, they may be summarized as follows:

1. Not all risks can be insured. The features whereby a risk may be transferred to an insurer are: (a) the existence of a large enough number of quite consistent and independent units exposed to risk; (b) the event should be accidental and fortuitous both for the insured and the insurer; (c) each loss must be able to be quantifiable as far as time, place, cause, and amount are concerned and must be able to be measured in monetary terms; (d) the expected loss should be large enough to justify the insurance costs.
2. On those occasions, when an insurer provides a full and total compensation for losses incurred, especially indirect losses the claim payout process requires times and typically the methods do not allow for an immediate return to the status that existed prior to the loss. These ramifications should always be kept in mind by the insured.
3. Not all premiums are certain. There are some types of insurances for which the premium is conventionally set on the basis of certain measures that are subjected to change during the insurance period. For example, the size of stocks or the amount of the employee remuneration for third-party liability. As a result,

Table 7.3 Benefits and costs of the captive insurance company

Benefits of the captive insurance company	Costs of the captive insurance company
1. Abatement of insurance costs	1. Incorporation and operating costs
2. Access to reinsurance market	2. Capital lockup
3. Improvement of the corporate cash flows	3. Risk of unfavorable results
4. Profitability	4. Innocent capacity
5. Effects on taxation	5. Reduced focus on physical controls over the risk
6. Instrumental in the insurance negotiations	
7. Transfer of uninsurable risks	
8. Development of an independent insurance business	

in these cases the total premium may be unknown when the decision to transfer the risk or otherwise needs to be made.

In addition to the limitations described above, we should consider a further and perhaps just as important is the limitation of the legal contents of a contract whereby the risk is transferred to the insurer. There has been a trend to consolidate basic contracts and exclusion clauses (mainly in favor of the insurer) that at times limit the efficacy of the contract.

7.4.10 What is a Captive Insurance Company?

In dealing with self-insurance we highlighted how one of the main drawbacks of its use is the fact that the yearly allocations provided for in the program are not always or completely tax deductible in addition there can be timing issues for tax deductibility. An option is to create a captive insurance company, i.e. a legally independent company owned insurer to which its own risks may be contractually transferred for a consideration.

In order to assess the convenience to establish a captive insurance company, several factors need to be considered (see Table 7.3).

An immediate advantage is the abatement of a portion of the insurance costs due to the savings of the premium mark-up charged by a normal insurer (acquisition costs, part of the operating costs, taxes on premiums, and so forth).

Another and just as important advantage is the possibility of directly accessing the reinsurance market which, being made up of insurers who are different from those of the primary market, is often based on different approaches to risk, which in turn may lead to advantageous contractual opportunities.

The use of a captive insurer may results in a significant improvement of the corporate financial flows. Indeed, while with a traditional third-party insurance program the premium usually needs to be paid in advance, the payment of a portion of the premium to a captive insurance company may be delayed until the latter needs cash to pay out claims. Moreover, where the captive insurance

company chooses to access the reinsurance market, the conventions of the latter often offered installment options for premium payment, thereby furnishing a further cash flow benefit. And if, as it often happens, the premiums for risk transfers are duly paid to the captive insurance company, a further benefit would ensue, consisting in the ability of retaining and using their profitability inside the group, which in future could generate further premium savings.

Along with the favorable factors, we should of course consider the costs associated with the establishment of such an owned entity. First, the incorporation and operating costs may be sizeable. Second, running a captive entity also requires significant professional skills. Third, we consider the fact that, as protection against the possible fluctuation of the losses arising out of the risks taken over, the captive insurance company must have an initial capital, which can be substantial depending on the risk and limits transferred to the captive which means locking up assets. For the parent company this initial capital amounts to tied capital and we cannot neglect the opportunity costs involved. We should also carefully assess the risk of unfavorable results, associated with either the occurrence of losses greater than those expected or the eventual lack of the protection achieved through the reinsurance.

A further factor to be considered is the fact that only in theory can risks not otherwise insurable also be transferred to the captive insurance company. Indeed it is not possible for any risk to be assigned only because this is done by a company controlled by the parent company, without any consideration for the long-term nature of the business it is called upon to perform.

7.5 Decision Making

Decision making is the cognitive process which leads to the selection of a set of actions among several alternative scenarios.

In risk management, decision making is not only about acting for eliminating risk. The goal is to protect the company from risks in an effective and efficient way. Hence, risk management decision making leads to the selection of those actions that can reduce and/or mitigate critical risks, assuring an economic benefit for the company.

It means that the cost of risk management actions implemented (like mitigations or transfer actions) should not exceed the saving that the company can get from the reduced risk profile.

Total costs of risk management actions should be assessed and selected with respect to time, operations, and human resources dedicated to risk assessment (administrative costs), comprehending risk control costs, risk financing costs, and the cost of both direct and indirect loss.

7.6 How to Measure the Cost of Risk?

The Cost of Risk (CoR) is a quantitative measurement of the costs of the negative events coming from risk occurrence compared with the costs related to risk management activities (risk control and risk financing).

In many organizations the CoR represents the budget that risk managers and insurance buyer should work with. This value comprehends the whole risk exposure, direct costs for risk treatment actions, financial results of captive insurance companies, costs related to the risk management function and all the fees, premiums, and commissions to brokers, insurer, and consultant as applicable.

From a strictly financial perspective the CoR measurement is typically expressed by the costs of managing risk through efficient use of capital (debt, equity, and off-balance sheet). The goal of an enterprise-wide analysis of the CoR is to understand and measure the investments and benefits related to:

- corporate risk profile;
- risk prevention strategies;
- better decision-making processes;
- improvements of process robustness;
- shareholder value and increased profitability.

The goal of the comparison is to determine whether the total costs of the risk management function are increasing, decreasing, or remaining constant as a function of the economic activity of the business. After the quantitative measurement has been derived, a comparison can be made between the CoR of that business and the CoRs of its peer groups. In addition, CoR will allow the business to focus on the areas of operation that will have the greatest long-term impact on its total risk management function costs.

Managers should accept reasonable risks and prepare contingency plans for the risks that pose the greatest threat to survival and success of the business.

7.7 External contribution 7.1: Innovation in the Context of Risk Management

Innovation in the context of risk management might seem somewhat out of place since we have said that enterprise risk management is all about mitigation and control of risk. Many will equate innovation with taking risk whether it can be incremental in relation to the existing products, services or methods of administration or disruptive in nature completely changing the product or service offering and how business is administrated.

But in order to better understand the role of innovation in the risk management process we can start by defining what we mean by innovation:

- enhanced features on existing products;
- replication of someone else's smart product;
- design of a brand new product;
- market movement of an existing product;
- geographic expansion.

Innovation actual takes many forms and in some cases it is the small movement on an existing product or service that can make all the difference. Continuous process improvement in the risk management processes and procedures will fall into the category of incremental innovation. Implementation of an advanced technological platform for modeling risks and the ability to assume more risk as an organization might be considered disruptive innovation.

In order to make innovation part of a successful enterprise risk management system there five ways to jump start the thinking required to embed innovative thinking the risk management process:

1. Go outside the comfort zone—seek the unpredictable.
2. Challenge the default position.
3. Try it!—testing and prototype. Fast failure is the key to fast success.
4. "What if that wasn't the question?"—challenge our assumptions.
5. Share all learning.

The "why be concerned" about innovation is tied to the organization's stakeholders. With the continuously evolving risks that an organization must manage it is critical to get "out in front". Innovation = anticipation. The more the organization can understanding the effects of this constantly changing risk landscape the better able they will be able to make risk management a competitive advantage. This is represented in Fig. 7.3.

What are the key attributes of an innovative organization and executive team:

- Visionary Executives and recognized thought leaders;
- strong risk appetite—"Fail, fail again, fail better." (S. Beckett);
- high profile of innovation internally—most staff engaged;
- continuous investment through cycles and some off cycle funding;
- repeatable formula and project management;
- innovation Champions—the viral distributors.

Innovation requires discipline and planning, one can say very much aligned with a successful enterprise risk management process.

Innovation in risk management cannot be completed in isolation it involves shared responsibility and hard work, so-called "collective intelligence". Other key factors in a disciplined approach to innovation in the context of enterprise risk management can be summed up as follows:

- comprehensive measurement and marketing;
- customer involvement and asymmetric 'peer' analysis—benchmarking is fine—as long as it is against interesting parallels, not industry leaders;

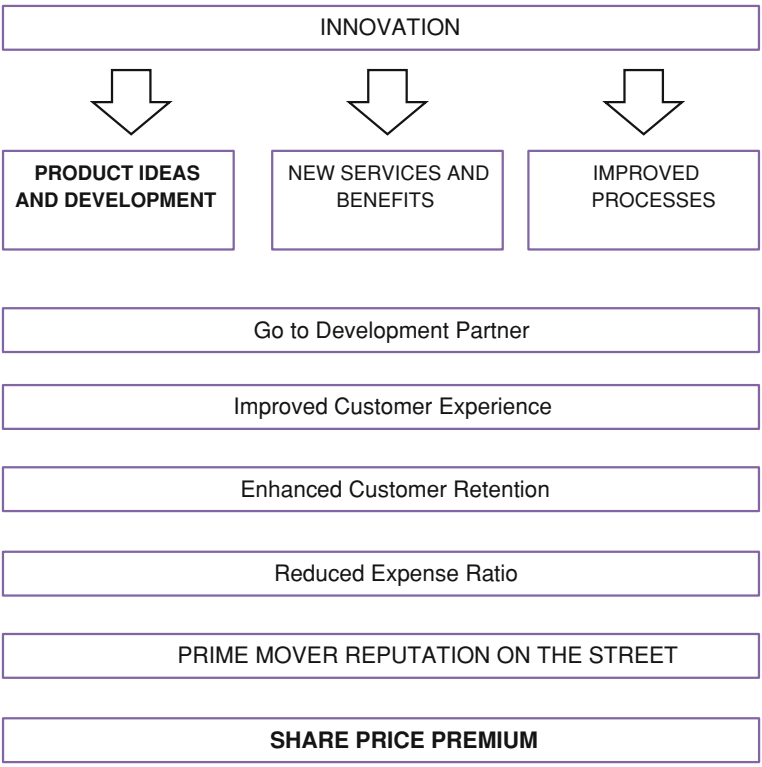

Fig. 7.3 Innovative thinking and risk management process

- celebrate the success and the failures—employee recognition and lessons learned.

As Lou Gestner of IBM stated: "In the end management doesn't change culture. Management invites the workforce itself to change culture".

So how does management invite a workforce to become intelligent and innovative risk takers instead of passive risk assumers?

As mentioned previously the organization must start with a clearly defined innovation process. This process overlaid with a well articulated enterprise risk management approach will include:

- The innovation purpose—guidance on the objectives is essential to the proper alignment of new products, services, processes, and procedures. Without a clear line of sight in conjunction with the organization's strategic mission the innovation process is destined to fail.
- The success profile—in fact it is critical to envision what success would look like for the organization. Just as with the ERM process understanding the destination will be as important as taking the voyage.

- Size of benefits, timing, and sequencing—innovation comes in many sizes but whether it is big or small the understanding of the right sequencing to bring a process or procedure into action and become part of the organization's DNA has to be properly analyzed.
- The governance scheme—innovation for the sake of innovation can pull important resources away from critical organization activities. Therefore, it is critical to continuously check and report in an open and transparent manner the progress of the process in order to guarantee an ongoing alignment with the organization's overall strategy. As mentioned before so many aspects of an organization's life are subjected to change and proper project management in this context can assure that innovation driven change remains aligned with the organization's desired outcomes over time.
- Alignment includes continuous analysis of the hurdles/roadblocks to be overcome, and if not possible what substitutes/alternatives might be available to continue to progress innovation in the enterprise risk management approach.
- Once in place it is essential to implement performance measurement/metrics and reporting on results. These measurements may be presented in the form of milestones or a status dashboard or similar reporting format.
- Underpinning successful innovation is the clear definition of team in all of its forms: formal, informal, central and distributed.

"Innovation is about changing course before it is absolutely necessary" (T. Peters).

Author Profile

Tony Cabot—Director Product Development for Europe and Asia—Argo Group
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Responsibilities as Director of Product Development for Europe and Asia role include providing a fluent and comprehensive system of Product Development that ensures that good ideas get to market in a controlled and consistent manner with minimal delay.

As the Senior Executive Officer for Argo Re DIFC Ltd. in Dubai, UAE Tony has responsibilities for setting the strategic direction of this subsidiary in alignment with the Argo group strategy in the MENA Region.

Tony is member of the CPCU Society's Board of Chapter Governors, International Insurance Interest Group and a founding member of the CPCU Society's Europe Chapter.

7.8 External contribution 7.2: The Role of an Insurance Partner

The role of an insurance partner is to provide coverage and risk management service either in the chosen line of business or in the chosen industry segments consistently on a medium to long-term basis.

In order to deploy the Partner's role an Insurance company should employee experts, and then maintain a constant level of investment in understanding the dynamics in the specific in the industry sectors chosen by the company.

In their role as Partner an Insurance company should help its clients with Loss Prevention advice, Business Continuity planning, Technical advices become a point of reference for its clients and able to opening share suggestions and remediation actions at 360°.

Like in the majority of European Insurance markets also in Italy the approach of Insurance companies is to be highly specialized in very few industry segments, such as Oil and Gas, Pharmaceutical, Aviations companies. This level specialization is driven by the treaty reinsurance market, and is strongly connected to the high volatility of some risks in these industries. This approach leaves all other industries to be insured with a standard approach, where most of the efforts are focused in adapting the policy wording to meet some needs.

An insurance company to become an Insurance Partner needs to put at the center of its organization the Customer to understand its operational risks along the value chain and potential liabilities and then to derive coverage and services needs. Insurance companies should help their customers becoming more competitive by avoiding risks which could impact the future strategic objectives set by the shareholders and damage their assets. Customers who have identified the risks associated with their activities and have chosen to manage these risks proactively have proven time and time again that in the moment of need they have survived and actually prosper further. A well known example was the loss at chip manufacturing plant of Philips in New Mexico in 2000. Nokia and Ericsson who, at that time, were competing head to head in the mobile manufacturing market were both supplied by this plant. Nokia knew about the risk and had in place a strong Business Continuity Plan; following the loss they contacted his alternative suppliers and kept Stakeholders informed. Ericsson instead was not so well organized. One year after the loss Ericsson shares lost approximately 40 % of their value while Nokia shares increased by almost 30 % and thanks to their brilliant organization they strengthened their market leadership in Mobile phones. Other more recent examples can be found following the March 2011 Earthquake loss in Tohoku region in Japan as mentioned in the Global Risks 2012 survey commissioned by the World Economic Forum. Lawson a Japanese convenience store chain thanks to their Business Continuity Management recovered within 4 days from the Earthquake its production lines and logistics hub sufficiently to resume approximately 80 % of its business.

RSA are one of the world's leading renewable energy insurers, with an in-depth understanding of the renewable energy industry built up through working with some of the biggest and most innovative clients in the sector.

For over 20 years our expertise and global reach delivers protection at every stage of development, from planning and transportation through to construction and operation. Effective insurance and risk management is required to protect these investments and help ensure that the renewables industry continues to develop at pace.

We provide insurance covers across the full customer experience including from the early shipment of material, through the construction phase and providing Property, Business Interruption, Liability, Engineering and Marine coverage during the operational life of the facilities, to Loss Prevention advise to help RSA customers to mitigate the consequences of negative events. We provide insurance covers for a wide range of renewable energy technologies including:

- Wind Energy—onshore and offshore facilities;
- Solar Energy—Photovoltaic, Concentrated and Thermal installations;
- Small Hydro—Power stations producing an output up to 50 MW;
- Bioenergy—Biomass, Biogas and Waste to Energy plants.

We offer specialized insurance solutions to a broad spectrum of clients and business partners including: Manufacturers, Utility companies, Independent power producers, Contractors, Investors.

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We are a market leader in the sector with around 10 % market share and have areas of clear market leadership such as offshore wind where we have an involvement in around 80 % of all offshore wind parks.

Our global operations are backed up and supported by three Centers of Excellence, that provide the best experts in the market place, who can be called upon when required:

- Canada—Hydro;
- UK—Solar and Biomass;
- Denmark—Wind.

Corporate Profile

RSA, founded in 1710, are one of the world's leading multinational insurance groups. We can offer insurance solutions in over 150 countries and have leading or significant market positions in the UK, Scandinavia, and Canada. Our capacity is among the biggest and most secure in the marketplace. We have some 20 million customers around the globe and approximately 22,000 employees. In addition, we

are a member of the Dow Jones Sustainability Index and the FTSE4 Good Index, and signatory to the United Nations Principles for Sustainable Insurance launched in RIO+20.

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