

## **Risks and Regulation of Insurance Companies. Is Solvency II the Right Answer?**

**B. Lorent**

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JEL Classifications: G20, G22, G28

Keywords: Insurance, Regulation, Solvency II, Liquidity risk, Systemic risk

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# Risks and Regulation of Insurance Companies. Is Solvency II the Right Answer?\*

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## Abstract

The role of insurance sector has grown in importance. While there is a plethora of academic literature on the needs for a banking regulation, literature on insurance regulation is scarce and mainly focused on asymmetry issues. In this paper, we describe the reasons for an insurance regulation. Recent developments faced by insurers modified the risks encountered by the sector, especially liquidity risk and systemic risk. The purpose of the discussion presented here is also to outline the specificities of the new framework for the regulation of European insurance undertakings, Solvency II, as it is currently discussed to provide an appropriate response to the changing needs of insurance regulation. Our analysis leads us to conclude that Solvency II answers well to the developing insurance sector. However, caution is warranted for some areas such as evaluation of embedded options and guarantees, risk transfer and financial conglomerates.

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## 1 Introduction

Why regulate insurance corporations? Unlike banks, literature on insurance regulation is scarce. Furthermore, it does not address the issues of run or contagion effects in case of failure of an insurance company. However, the insurance sector has dramatically evolved over the last twenty years, being increasingly linked to the banking sector and offering products that often have large similarities with savings products offered by banks. Have these evolutions changed the needs for the regulation of insurance companies? If yes, are these needs addressed by Solvency II, the new prudential regulation for insurance companies? These are the questions that this paper will attempt to answer. Whereas many scholars have analysed risks and regulations related to the banking sector, the academic literature is a lot less developed on the regulation of insurance companies. This paper also compares bank and insurance sectors through a regulatory objective.

The paper is structured as follow. Section 2 sums up the major changes recently faced by the insurance industry. Section 3 compares needs for a banking regulation with the insurance sector. Section 4 shows how Solvency II aims to match these needs with the challenges of the insurance sector. Section 5 contains concluding remarks.

## 2 Recent developments faced by the insurance sector

The financial services landscape has dramatically changed over the last few years. Insurance is an important and growing part of the financial sector, and therefore of the economy. The time when companies used to sell only classical insurance contracts is over. Insurance companies have turned into saving vehicles, especially in the life business. Moreover, we can expect that, in the near future, this trend will be exacerbated by the ageing population. Indeed, longer life expectancy might create a financial gap between working and retired populations. As a result, society will have to manage the financing of social security, especially in Western Europe. Today, this phenomenon has led many countries to a privatization of their pension system and the future retired population is more and more inclined to buy life insurance products. Life products became long-term savings products. In Europe, life premiums per capita went from around 400 € to more than 900 € between 1993 and 2004 (CEA 2007).

Traditionally, the role of insurance companies is threefold. Firstly, the insurance sector protects agents who dislike risks by transferring these risks to enterprises more willing to bear them. Insurers then encourage companies and individuals to undertake projects and activities that they would not launch otherwise. Secondly, the insurance sector spreads risks by aggregating uncorrelated and individual risks following the law of large numbers. Thirdly, by allocating the right level of premium to each agent of

the economy, i.e. policyholders or companies, insurance firms encourage to reduce the level of risk.

Initially, life insurance business was different from savings because the present value of amount paid by the policyholder as premiums was not tied to the present value of the amount paid by the insurer as claims. The main function of life insurance has traditionally been to offer protection against an early death. The amount of claims paid by the insurer depended only on the age at the time of death. Nowadays, with the increasing assimilation of banking-type activities by life insurers, the situation has changed. Henceforth, new life products are marketed on the basis of their investment characteristics: return and/ or liquidity. For instance, guaranteed investment contracts, unit-linked contracts, universal contracts, etc. are offering investments features. In the non life business, more commonly named the property-casualty sector, the amount of claims paid by the insurer depends on the nature of the accident or on its severity. Individually, the present value of premia paid by the policyholder is not equal to the present value of the claims paid by the insurer. But within a large, diversified and homogeneous portfolio of policyholders, the claims paid should converge towards its expected value equal to the present value of premia<sup>1</sup>. This mechanism is based on the law of large numbers.

As financial intermediaries, insurers are involved in asset transformation. The premiums collected from policyholders are invested on financial markets under the supervision of the regulatory authorities. The total sum of investments in the European economy, estimated at market value, amounted to approximately €6,910bn in 2006 (CEA, 2007). This represents an increase of 5.3% compared to 2005. On average, in Europe, investments of insurance companies represented 57.5% of the GDP in 2006 against 55.2% in 2005 and 50.1% in 2000 (CEA 2007). Again, this rising ratio shows the increasing role played by insurers in the economy.

Within a few years, insurance companies became major actors on financial markets. On European stock exchanges, they are the largest institutional investors. The relative boom of the stock markets at the end of the 1990s has also fuelled the growth of life products especially unit-linked products. On average, at European level, the proportion of shareholdings<sup>2</sup> by insurers in the total market capitalisation was 24.7% in 2005 against 23.4% in 2004 (CEA 2006). Recent volatility of financial markets (e.g. 2000 and 2001) has shown the close link between stock markets and financial results of insurance companies.

Risks faced by insurers have also evolved, especially in the non life sector. Risks linked to terrorism, natural catastrophes e.g. hurricane Katrina or health e.g. bird flu have generated higher and more frequent damages. These trends put the insurance

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<sup>1</sup>If we do not take into account the other cost such as operational or commercial costs.

<sup>2</sup>Ratio of “shares held by insurers on a country stock market total”. It also holds non-quoted companies and shares of companies quoted on foreign stock markets.

industry or more precisely the reinsurance sector under a lot of pressures. Furthermore, the reinsurance sector has been fuelled by the growing insurance penetration, especially in the emerging countries and the increasing worldwide value of properties.

With the increasing demand for life products having investments characteristics, risks faced by insurers evolved from a technical risk to a market risk. Financial innovations such as derivatives contracts have radically modified the investments portfolios, increasing the complexity of financial companies. This trend has been partly fuelled by the success of the financial industry in creating a variety of innovative products: hence, an increased complexity of risk-management techniques. In order to guarantee returns to policyholders, the insurance sector has looked for investment vehicles with larger returns and thus larger margin profitability. Financial innovation can be divided in three categories: securitization/ bond structures, insurance derivatives and contingent capital structure (Das, Davies & Popdiera, 2003). The common theme is that under these arrangements the amounts payable or receivable are contingent upon the occurrence of an adverse event, and the insurer overall exposure to loss is thus reduced. The drawback for this kind of products is that they are not well understood by regulators and supervisors. Therefore, these products represent a new kind of risk for insurance companies.

Such as every other sector, the insurance industry also faced failures. Recent cases of financially distressed insurers provide evidences on potential fragility of the sector (Plantin & Rochet, 2007). Management issues are often at the root of insurers' troubles. Asbhy, McDonnell and Sharma (2002) analyzed 21 companies which breached their solvency requirement or were close to doing so. The four main identified problems are managerial incompetence, an excessive risk appetite, a lack of integrity by the managers and local managers lacking autonomy and facing pressures from the parent company.

### **3 Regulation of the Insurance Sector**

#### **3.1 Asymmetry of information**

Protecting small depositors is the main objective of a bank regulation. Banks, insurers and most financial and nonfinancial firms are subject to substantial asymmetries of information (Dewatripont & Tirole, 1994). Two kinds of asymmetries of information: moral hazard and adverse selection are inherent in all relations between sellers and buyers.

Two kinds of moral hazard come into play between banks and customers. On the one hand, banks have little information on the capacity of borrowers to pay back their debt. This phenomenon requires market solutions such as collateral or guarantees. On the other hand, depositors do not know if their savings are in a safe

place. Investors must therefore perform a variety of monitoring functions: screening, auditing, covenant writing and intervention (Dewatripont & Tirole, 1994). These functions are complex, costly and time-consuming (Diamond & Dibvig, 1986). Bank debts are held by small, dispersed, unsophisticated and uninformed investors. Customers of a bank have little incentives to perform these various monitoring functions. This concern creates a need for public representatives of depositors (Dewatripont & Tirole, 1994). Regulation sets up rules and procedures to avoid asymmetries such as regulatory capital requirements or charters.

The current insurance regulation literature focuses mainly on asymmetry issues. Such as in the banking industry, asymmetry is studied from both the policyholders and the insurer institutions' points of view.

On the one hand, insurers face moral hazard and adverse selection. As soon as policyholders have been insured, the company does not have any more control on their behaviour. From the instant a policyholder buys an insurance contract, he does not fully bear the consequences of his actions. For instance, in the motor business, the policyholder can drive faster or drink before taking the wheel. He no longer fully benefits from the positive consequences of efforts to reduce his level of risk. The insurer faces a risk of moral hazard. This issue requires market solution such as deductibles or alignments. Adverse selection, the involuntary selection of the higher-risks by the insurer, occurs because the policyholder has more information on his level of risk than the insurance company. A consequence is that people with a high level of risk are more inclined to buy insurance contracts than low-risk profiles. The company cannot tell the difference between high- and low-risks. As a result, insurers price at an average level and low-risks subsidize high-risks. The danger deriving from such a situation is that low-risk profiles can decide to quit the company resulting in a high-risk profile company.

On the other hand, as depositors, policyholders do not have any supervision on the way their premiums are used and managed. They bear a counterparty risk on the insurance company. This is a moral hazard faced by policyholders. As depositors, policyholders are ill-equipped to evaluate the financial strength of their insurers. Regulation provides a solution for this issue. Indeed, according to the public interest theory (Klein, 1995), there are imperfections in the insurance market and the role of the regulator is to prevent these imperfections i.e. the agency problems concerning conflicts of interest within firms. In insurance companies, the agency problem is illustrated by the different incentives between firm owners, i.e. shareholders and debtholders<sup>3</sup> (Dewatripont & Tirole, 1994 and Plantin & Rochet, 2007). Shareholders are incited to take risky actions because of their limited liabilities. They fully benefit from upside actions but are limited in downside situations. On the opposite,

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<sup>3</sup>Policyholders for the insurance industry

policyholders are not interested in the profits of the firms. They only want to have their claims paid back at the right moment.

Regulation should protect the policyholder by guaranteeing that the insurance company would be able to meet its obligations in case of a claim. Public policy primarily seeks to overcome difficulties of consumers in observing and monitoring the financial health of their insurer, both before and during the lifetime of the insurance contract (OCDE, 1998). Typically, around 90% of the right-hand side of the balance sheet, i.e. technical provisions, is held by policyholders. Insurance companies are highly-leveraged undertakings. Unlike non-financial firms, holders of liabilities are not sophisticated policyholders. Indeed, tough claimholders such as banks or large shareholders are nearly absent. They would be interested in the possibility of not recovering the full value of their loans if the situation further deteriorates. In addition, unlike bondholders, policyholders cannot protect themselves against the insolvency of specific debt issuers by holding a diversified portfolio (Cummins, 2001). Classically, policyholders rely on one insurer for each type of protection purchased.

Usually, an insurance company failure is a result of a combination of different causes and effects. An insurer distress generally results from two separate causes that reinforce each other: corporate governance and external shocks. In most of the cases, the starting point is a poor management action combined with an external shock such as interest rate decrease or real estate crisis. This external shock is the easiest to identify. But other companies facing the same shock do not necessarily have similar financial difficulties. This trigger event brings to light underlying weaknesses of the companies such as inadequate internal control or failures in reporting systems. Corporate governance problems refer to situations where top managements make decisions which undermine the future of a firm. Such decisions can be bad or fraudulent investments, inaccurate reinsurance or financial policy, excessive external growth or inappropriate commercial policy such as underwriting bad risks or underpricing contracts (Plantin & Rochet, 2007).

A major characteristic which differentiates the insurance sector from other financial companies exacerbates insurance companies' corporate governance and agency problems: the inversion of the production cycle. It means that the service, the payment of the claim, has been produced after it is bought by the policyholder, the payment of the premium. The interval between these two events may range from a few days in non-life contracts to more than fifteen or twenty years in life contracts.

Insurance is based on the probability theory. The premium is fixed before knowing the cost of the claim. The final cost for the insurance companies depends heavily on managers' skills to determine the premiums. As a result, agency problems between managers and holders of liabilities, i.e. shareholders and policyholders come into play in the insurance sector. For skilled managers, it is easy to underreserve, i.e. underestimate the value of the liabilities in the balance sheet during a long period if

for instance, the company underwrote unprofitable business for several years. Under-reserving makes the hiding of losses or management mistakes possible during a long period and therefore undermines the future of a company<sup>4</sup>. This situation may result in situations where managements had to gamble for resurrection. In fact, if these bets fail, further future losses have to be compensated by taking even riskier bets. Betting for survival by choosing large profit projects with small probability of realisation is a situation favourable for shareholders at the cost of debtholders, especially when the company is undercapitalized. Moreover, these losses do not materialize immediately into liquidity needs and they create room for an endogenous amplification of exogenous shocks because of excessive risk taking (Plantin & Rochet, 2007). If associated with the absence of endowment of the right agents for cutting losses, it can end in an insolvency problem and the failure of the company. None of the agents with relevant information and control rights have the right incentives to undertake prompt corrective action when required. Thus, the control function has to be enforced by external regulation.

### 3.2 Liquidity risk and Insurance run

Liquidity risk<sup>5</sup> is the potential that an institution will be unable to meet its obligations as they come due because of an inability to liquidate assets or obtain adequate funding or that it cannot easily unwind or offset specific exposures without significantly lowering market prices because of inadequate market depth or market disruptions. In the next two sections, we will first introduce the concepts in the context of the banking sector. Then, we will extend conclusions for the insurance sector.

Banks have a special role in the transfer of funds from depositors, essentially households, to the productive sector. Also, the structure of the bank's balance sheet itself is a source of regulation need (Bryant, 1980, Diamond & Dybvig, 1983, Diamond & Dybvig, 1986). Banks transform short term liquid assets, the deposits, into long term illiquid liabilities, the loans. Duration gap is then a major concern for the banking sector. While the depositors face a sequential service constraint, they cannot predict when they will need to withdraw their funds. As long as the bank has enough money to cover all withdrawals, the system will work efficiently. Because banks practice payment on demand and on short notice, lack of liquidity is much more critical for banks than for other businesses. If a fraction of the depositors withdraws its deposits early and if a too large number of depositors fears these early withdrawals, a run on the bank can be triggered off in the form of a self-fulfilling prophecy. A massive early withdrawal from a bank induces a cost to the remaining depositors: the risk that the bank becomes insolvent. Depositors take their decisions without

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<sup>4</sup>See, for example, the case of Independent Insurance Company Limited (Plantin & Rochet, 2007)

<sup>5</sup>Definition of the Federal Reserve Bank of Chicago

considering the effects on the bank solvability. Due to the illiquid nature of assets and if the reserve of the bank is insufficient, the company will not be able to reimburse all the deposits causing the bankruptcy of the institution.

In the second class of bank run models, runs are caused by the release of new information on the asset side of banks (Diamond & Rajan, 2003, Chari & Jaghanathan, 1988, Gorton, 1985, Bhattacharya & Jacklin, 1988, Chen, 1999). In the model developed by Bhattacharya & Jacklin (1988), some informed depositors receive an imperfect signal that the risky investment made by the bank may yield lower than expected payoff. They may therefore decide to withdraw their deposits forcing the bank to liquidate its assets prematurely.

Compared to banks, insurance companies hold less illiquid assets. These assets are composed of equities, bonds, loans and real estate. Insurers are thus less prone to liquidity risk. A distinction has to be made here between non-life and life companies. Liabilities in the non-life sector are by nature essentially short term items. Indeed, the claims are unpredictable in terms of amounts or occurrence. Then, assets covering liabilities should have a high level of liquidity in order to quickly respond to a claim. Non-life insurers hold more liquid assets such as equities or bonds than banks. Liabilities in the life sector are by nature long-term oriented. Assets are thus long-term oriented e.g. real estate, private equity, long-term bonds. The matching duration is a constant objective in order to smooth the interest rate risk.

Most of the literature dedicated to insurance regulation ignores the insurance run phenomenon or considers that it cannot take place in the insurance sector (Morrison, 2002, Plantin & Rochet, 2007). Authors state that insurance run is not a typical threat for the sector. Indeed the policyholders do not have the same rights as the depositors. They often have to pay compensation for an early revocation or withdrawal of the contract. In addition, the cancellation repayment or surrender of insurance products usually takes longer than the repayment of bank deposits.

The longer duration of liabilities in the life insurance industry compared to banks makes the occurrence of an insurance run less likely. However, over the last years, changes of the market conditions faced by the insurance sector have made the industry more vulnerable. One trend is particularly crucial: the assimilation of banking-type activities by life insurers (Das, Davies & Podpiera, 2003). With the assimilation of saving products by life insurers, policyholders are more vulnerable to external factors such as legal environment e.g. changes in taxes or in tax deduction, competition with other savings vehicles and fluctuations of financial markets conditions. This is particularly true with the success of unit-linked products where returns are linked to a fund. A unit-linked contract is a contract that does not guarantee fixed cash payments, but instead a fixed number of shares in some investment vehicle. The investment risk is borne by the policyholder. This characteristic makes this type of product relatively similar to mutual funds or asset management products. Policyhold-

ers view unit-linked products as being more a savings investment than a protection product. Traditionally, there are two kinds of life products: policies with a minimum guaranteed return and unit-linked policies.

During the 1990s, unit-linked products showed a tremendous growth from 21% of the total life premiums in 1997 to 36% in 2001 (Swiss Re, 2003b). In 2001, life insurers in Western Europe held 1 020 billions of assets invested in unit-linked products. This corresponds to 11% of the GDP of Western Europe. Decreasing interest rates and booming stock markets were two of the key factors contributing to the growth of unit-linked products in Western Europe. In 2001 during the crisis on the stock markets, the unit-linked product industry declined. Initially, with unit-linked products, the policyholder bears the investment risk. But the fierce competition in the life insurance business has led many insurance companies to introduce additional features to unit-linked products such as guaranteed minimum accumulation benefit, guaranteed minimum death benefit, guaranteed return, conversion option, option to surrender the policy, etc. Europavie, a French life insurer, got into trouble in the early 1990s because they guaranteed a high interest rate on unit-linked products backed by real estate. When the French real-estate bubble burst, the company went in financial difficulties. As a result, Europavie has been taken over by Thinet, a diversified conglomerate, in 1994.

Life insurers offering unit-linked products face new operational, financial and regulatory risks. Financial risks result from the difficulty to price additional options on a long term horizon. The surrender options are the most common additional options in unit-linked and in minimum guaranteed return products. These embedded options allow buyers to withdraw funds in case of interest rate changes or other economic fluctuations. Generally, if the policyholder decides to surrender the contract, he has to pay a surrender fee. Usually, the fee declines with the duration of products. In some countries, such as the United Kingdom and Germany for some specific products or in France, this fee does not exist. In other countries, the government or the authority control have imposed maximum cost ceilings for some life products or constraints on surrender possibilities. Under the pressure of concurrence, governments and consumers associations, we believe that this trend will become more pronounced. Consequently, policyholders will be more inclined to cancel their policies and change for other products and suppliers with no extra cost, increasing the volatility of business and reducing the duration of the liabilities for insurance companies.

Flexible products can deteriorate the balance sheets in different ways. The problem is particularly acute in case of yield guarantees and early surrender options (Briys and De Varenne, 2001). With this kind of products, in case of a decline of the interest rates, the insurer faces a risk of reduced income. Consequently, in case of guaranteed rate products, financial income may not be enough to cover liabilities. Conversely, in case of a sudden increase of the interest rates, policyholders may be tempted to

exercise their early options in order to invest in other products with a better return<sup>6</sup>. In brief, the duration of the liabilities could be significantly shortened by the introduction of greater flexibility. The banking-type products introduced maturity mismatches between assets and liabilities, a new exposure for traditional insurance companies (Das, Davies & Podpiera, 2003).

The introduction of guarantees in insurance companies during the 1980s has led many companies into financial difficulties (Das, Davies & Podpiera, 2003). For instance, in Japan, insurers provided policyholders with relatively high guaranteed rates. During the 1990s and the subsequent decrease of the interest rates, insurers were not able to remunerate high guaranteed rates. This situation associated with a deregulation of the Japanese financial landscape led to a collapse of eight mid-sized life insurers between 1997 and 2001. The same phenomenon occurred in Korea during the 1980s and the 1990s when insurers functioning as quasi banks, intermediated capital to other sectors (Das, Davies & Podpiera, 2003).

The life insurance sector in the United States also experienced a period of troubles with around 120 bankruptcies during the late 1980s<sup>7</sup>. At the time, companies offered high yields and options such as guaranteed minimum rates, early surrender, contractual loans, etc. The top of the crisis surely took place with the collapse of Executive Life in January 1990. After an increased inflation and interest rates from 1977 to 1981, the life industry appeared less attractive to policyholders. At the same time, the deregulation of the financial landscape allowed insurance companies to offer higher-yielding investment products such as guaranteed investment contracts, universal life contracts, variable life contracts<sup>8</sup>, flexible premium variable life contracts or single premium deferred annuities. With these products, life insurers offered contractual options such as yield guarantees, early surrender options, contractual loans, extensions, etc. These options created additional financial risks for life insurers. Facing the competition with other savings vehicles such as pension funds, insurers invested in higher yielding assets. In 1991, nine large life insurers failed mainly due to two problems: an overinvestment in real estate and junk bonds, and an availability of large amounts of contracts with promised fixed yields (Das, Davies & Podpiera, 2003).

The introduction of new options in life insurance products increases the liquidity of liabilities. At the same time, since assets of insurers are partially illiquid like real estate, loans, private equity and long-term bonds, an insurance company is subject to liquidity risk (Cummins, Phillips & Smith, 1998). In case of financial distress, the insurer should liquidate its assets but liquidating assets in a rush is costly. Illiquid

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<sup>6</sup>In the United States, the annual surrender rate rose from 6 % on average in the 1960s to over 10 % from 1982 to 1987 after the sharp increase of the interest rates.

<sup>7</sup>For an extended explanation of the American life industry history crisis, see Briys and De Varenne (2001)

<sup>8</sup>Through which policyholders can choose the nature of their investments, i.e. equity, bond or money market rates

assets are often sold at a price below the book value. For instance, claims on reinsurers or financial intermediaries as brokers become more difficult to collect. Indeed, reinsurers and financial intermediaries do not have the incentive to pay back their claims as the company ceased to be a going concern. Regarding liquid assets as stock or bonds, they can be sold at a discount price if financial markets perform under adverse conditions. By liquidating assets during a run, insurers force down the price of the assets and aggravate the crisis (Allen & Gale, 1998, for the banking sector). In particular, this can accelerate the decrease of financial markets and the difficulties for companies to get their assets back. When a firm in financial distress needs to sell assets, the likeliest potential buyers of assets are industry peers. However, they are likely to be experiencing problems themselves, leading to asset sales at prices below value in best use (Schleifer & Vishny, 1992).

The deregulation and the growing competition in the insurance sector may induce insurers to invest in more risky assets such as commercial mortgages, real estate or junk bonds in order to offer high yields, exactly as it happened in the US during the 1980s. Insurers may become more vulnerable to economic shocks as real estate crisis or interest rates shift. In case of interest rates increase, policyholders may be tempted to surrender their life policies in order to invest their savings elsewhere in optimum conditions. Insurers would then be forced to sell their assets just after their market value has fallen. Furthermore, according to Das, Davies & Podpiera (2003), if the economy plunged into recession, such risky investments would become a heavy burden for the insurers.

A bank run phenomenon is particularly severe because of the asymmetry of information. When it is costly to collect and analyze information, creditors are more inclined to follow blindly the behaviour of other investors. The first-come, first served repayment makes creditors rush to withdraw their money from a financial institution. This conclusion may be also true for the insurance sector. A run on an individual company depends on the confidence of their creditors. A loss of confidence may appear after a severe macroeconomic shock such as, for instance, a stock market or real estate slump or after financial difficulties of a company spread through the system due to financial linkages among institutions (Das, Davies & Podpiera, 2003).

Macroeconomic shocks such as interest rate increase or decline on the stock markets can induce a wave of surrenders. Surrendering policyholders wishes to withdraw their savings early. The crucial point, such as in the bank run model, is that fear of early withdrawals by a too large number of holders of less liquid products may trigger an insurance run. They can in turn decide to surrender their products even if they would suffer from higher losses. The insurers would face a liquidity risk. With the increasing liquidity of liabilities thanks to the introduction of embedded options, the insurance industry faces a higher risk of insurance run. In this situation, second class bank run models may be applied.

Other events can hit companies individually. In case of macroeconomic shocks, all companies would be affected. Policyholders would find other types of investment products such as pension funds or bonds. The substitution possibilities for policyholders are then reduced. But events can also affect one single company. For instance, in case of downgrading of a company, the policyholders will see this event as an adverse signal on the future of the company. Consequently, holders of the most liquid products such as products with no exit costs or at least few costs or unit-linked products would easily withdraw their savings. This would force the company to sell its assets at a discounted value. The company faces a liquidity risk. Again, the holders of less liquid products can in turn decide to surrender their products even if they would suffer from higher losses. Once more, bank run models may be applied. Finally, the insurer would collapse. As the insurance sector faces asymmetries of information, policyholders can see this bankruptcy as an adverse signal affecting the entire sector, inducing a systemic risk.

### 3.3 Contagion and systemic risk

Systemic risk refers to the risk or probability of breakdowns in an entire system, as opposed to breakdowns in individual parts or components, and is evidenced by co-movements (correlation) among most or all the parts. Contagion usually refers to the spillover of the effects of shocks from one or more firms to other firms (Kaufman, 1994).

Banks<sup>9</sup> finance each other through the interbank market. A liquidity problem forces the bank to raise money instantly from other banks or creditors in order to increase its liquidity. As a consequence, other banks may become insolvent or seem to become. This can result in a widespread bank panic or a bank run. Moreover, the bankruptcy of one bank may be interpreted by depositors of other banks as a signal of a weakness of the entire sector. Consequently, the depositors of concurrent banks will withdraw their savings inducing bank runs even if these banks are solvent. The failure of one institution can trigger bankruptcies of other institutions. The stability of the banking system is thus affected. A banking sector failure would cause real damages to the economy (Kaufman, 1994) because it restricts credit which in turn restrains the flow of investment and real consumption and ultimately lead to an economic downturn.

There is no extended academic literature regarding possible contagion effects in the insurance sector. Polonchek and Miller (1999) studied the valuation effects of equity issuance by insurance companies on rival firms. When stock prices of financial

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<sup>9</sup>For an extensive survey on the systemic risk, see De Bandt and Hartmann (2002). For a model of contagion see Rochet, Tirole and Rajan (1996), Allen and Gale (2000) or Freixas, Parigi and Rochet (2000)

institutions show highly similar movements during adverse shocks, this can indicate systemic risk. In an environment with asymmetries of information, an equity issuance may be interpreted by investors as bad news for the company. Following the pecking-order theory (Myers, 1984), securities issuance announcements are viewed by the market as a signal of private information held by the management on the future situation of the firm. The corporate managers have incentives to issue equity when they view the company as overevaluated at the current price. The empirical results, conducted in the American market, suggest the possibility that the market interprets an announcement of an equity issuance as revealing adverse information about the quality of insurance company portfolios in general (Polonchek and Miller, 1999). An equity issuance announcement may induce relatively uninformed suppliers of funds, i.e. shareholders and policyholders to infer that the quality of all insurance companies has deteriorated. No evidence has been found for a cross-firm contagion in the property & casualty sector. But regarding the life sector, the announcement of an equity issuance by a life insurer generates significant cross-firm effects. With the assimilation of bank activities by life insurance sector, we can fear that this tendency has been exacerbated. In the banking sector, announcement of bank equity issuances significantly decreases the market value of rival banking and investment banking firms (Slovin, Sushka & Polonchek, 1992). The release of adverse information regarding a specific bank generates externalities on the rival banks.

Extreme co-movements within a sector are stronger for insurance companies than for banks (Minderhoud, 2003). This can be justified by the fact that the insurance sector is less diversified in terms of business lines and market activities than the banking sector. Also, life companies are fairly similar, difficulties in one company may indicate difficulties in other companies. Life companies have generally large exposure to securities markets. As they are quite opaque corporations, it is hard to assess the total risk that these companies are running.

Polonchek & Miller (1999) evaluate contagion effects within the insurance sector before and after 1990. Indeed, at this period, revelations were released saying that the quality of the assets held by life insurers was deteriorating. Two major life insurers in particular made asset write-downs in 1990. These events induced market revaluation of all portfolios of insurance companies (Fenn & Cole, 1994). As the market has already integrated the asset write-downs, an equity issuance announcement does not have to be interpreted by the market as an adverse signal. No statistically significant contagion was found after 1990. This evidence is consistent with the hypothesis that the well-publicized asset quality problems in the life insurance industry modified the perception of the quality of all insurance companies. A cross-effect contagion may be observed if policyholders and shareholders see a positive correlation between the asset portfolios of insurers. Indeed, an increase of the interest rate, a sharp fall of stock or real estate markets are effects positively correlated to all asset insurers

portfolios. In particular, recent financial crisis e.g. in 2000 and 2001 showed the importance of stock markets on the insurers financial results. Fenn and Cole (1994) found evidences of contagion for firms with a portfolio composition similar<sup>10</sup> to that of the announcing firm. This result proved that investors are relatively uninformed. Therefore, the release of information on the assets' quality of the announcing firm leads the market to reevaluate the assets' quality of similar companies.

The increasing blurring of the boundaries between insurance and other financial institutions, especially in the OTC derivatives market, implies a heightened importance of the insurance industry for systemic financial stability and calls for a stronger supervisory focus on financial risks (Häusler, 2003). Before that, it was unlikely that banks and insurers were affected by the same shocks, essentially due to their different risk profiles. But in light of the convergence of their risk profile such as bancassurance, cross-shareholding or risk transfer instruments, the banking and insurance sectors may be increasingly affected by similar shocks. Minderhoud (2003) showed preliminary evidence in the contagion<sup>11</sup> from the insurance sector to the banking sector. The results show significant extreme interdependence between banks and insurance companies that cannot be explained by movement in macroeconomic fundamentals. The high interconnection of financial institutions does not apply to companies within the insurance or banking sector but also among those sectors, for example through cross participations and the use of credit derivatives. Brewer & Jackson (2002) showed strong evidence of significant inter-industry shareholder wealth effects between commercial banks and life insurance companies. They established that the commercial bank announcement negatively impacts the equity values of life insurance companies and vice versa.

Bancassurance can bring systemic effects by exploiting the correlation of risks between banks and insurance companies and prevent destabilizing asset sales (Santos, 2006). The development of financial conglomerates, i.e. bancassurance and assurance financially more sizeable and geographically more globalized, confirms this additional risk of contagion (Plantin & Rochet, 2007). The complexity of managing these large conglomerates can in itself bring new risks (Santos, 2006). A failing life insurance company could indirectly lead to a bank run via contagion to the bank within a bancassurance group; or a failing bank in conglomerate could transfer bad assets to the group insurance company.

Thinet went bankrupt in 1997 because the conglomerate used the asset of a bank subsidiary to redeem the insurance contracts (Plantin & Rochet, 2007). As a result, the bank became insolvent and the whole conglomerate failed. In Jamaica during

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<sup>10</sup>Companies with significant junk bond/commercial mortgage assets and mobile customers as represented by guaranteed investment contracts

<sup>11</sup>Contagion in this paper is defined as a significant increase in co-movement after an initially idiosyncratic shock.

the 1990s, a severe crisis across the financial industry occurred. After a financial deregulation, insurance companies invested actively in the real estate markets and introduced many options and guarantees in their products. Furthermore, intense competition led to a tight connection between banks and insurers. After a tightening of the monetary policy, problems appeared in some insurance companies. Financial problems spread through the conglomerates leading to problems in the banking system liquidity and consequently, across the financial system.

A growing volume of risk is transferred from banks to insurance companies. In 2001, at a world level, banks bought 47% of credit derivatives products. At the same time, insurers and reinsurers sold 33% of these products. This tendency is a potential channel of contagion between these two sectors. Some observers argue that what is good for the banking system may not be good for the financial system as a whole (Greenspan, 2005).

It seems that insurance companies have been the biggest takers of credit risk outside the banking system (BIS, 2003). The insurance sector can suffer from large losses in case of widespread default. This could force the industry to massively liquidate their assets, triggering a systemic crisis and especially a contagion to the banking system through the credit risk transfer. Nevertheless, the exposure of credit risk is small in comparison to the insurer's assets. But, with the developing market of credit derivatives, we believe that this risk will increase in the future.

A liquidity problem and consequently a bank run could happen if insurers cannot meet their commitments. Some authors have argued that credit risk transfer can be favourable as they improve the diversification of risks as the risks faced by insurance and banking sectors are not totally correlated. The credit risk transfer may be beneficial when banks face uniform demand for liquidity (Allen & Carletti, 2005). Credit risk instruments can improve bank liquidity, therefore lightening the bank runs risk. But in some situations, new credit risk transfer instruments can lead to a fall in welfare through the creation of contagion in other sectors. When banks face idiosyncratic liquidity risk and hedge this risk in an interbank market, credit risk transfer can be detrimental to welfare (Allen & Carletti, 2005). It can lead to contagion between the banking and insurance sectors and increase the risk of crises, especially when insurance companies and banks hold the same assets. A severe shock affecting one sector may force large sales of assets, inducing a depression.

The financial markets have direct impacts on the financial results of insurance companies, as proved by the recent stock markets crisis in 2000 and 2001. But the insurance sector contributes also to the development of capital markets. The growth of contractual savings<sup>12</sup> and the non-life insurance sector induce the development of capital markets both in terms of depth and liquidity (Impavido and Musalem, 2000,

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<sup>12</sup>Pension funds and life insurance companies

Vittas, 1998). The indirect impact of contractual savings and the non-life insurance sector development are related to increased financial innovations and positive spillovers for other financial intermediaries and for the corporate sector.

The development of the insurance sector has correlation with economic growth (Catalan, Impavido and Musalem, 2000, Outreville, 1996, Haiss & Sümegi, 2006). As insurers hold longer-term liabilities, especially life insurers, they provide capital to borrowers who want to launch long-term projects. The insurance sector increases entrepreneurial projects, creates wealth, mobilizes savings, develops capital markets and reduces the total risk of an economy. Contractual savings and non-life insurance companies reduce the cost of capital including a reduction in the country risk premium due to improved resilience of governments, banks and enterprises to shocks, and in reducing the spread between long and short term interest rates. By maximizing risk adjusted returns on a large pool of funds, insurers tend to have more diversified portfolios than individuals. This function allows individuals to efficiently achieve portfolio risk diversification.

Insurance companies represent a large share of financial assets in many economies. They are even the largest investor in European stock exchanges. Academic literature (Levine & Zervos, 1996, Levine, 1997) shows a long-term positive effect of capital markets on the investment capacity of companies, and consequently on the economic growth. The increasing dependence between financial markets and insurance companies could be a danger in case of a large failure of the sector.

Finally, the reinsurance sector is an important source of systemic risk for the insurance sector (Das, Davies & Podpiera, 2003, Rajan, Rochet & Tirole, 1996). Reinsurers smooth insurer's volatility and provide them quasi-capital. The systemic risk associated with the reinsurance sector can be double: the lack of reinsurance cover and the bankruptcies of insurers and banks caused by the insolvency of reinsurers (Swiss Re, 2003a).

Large shocks on the insurance sector, such as the 11th September attacks or the Katrina hurricane is often followed by increased premia and a reduced insurance coverage. This can limit the risk taking behaviour by those seeking insurance, leading to a decreasing of new projects.

Regarding a risk of contagion inside and outside the reinsurance sector, the same conclusions as the ones for the insurance sector have to be drawn. The growing use of credit risk product has made the link between reinsurers, insurers and banks an increasing threat for the financial stability. The failure of large reinsurers could result in rapid contagion on the insurers and consequently on the entire economy (Das, Davies & Podpiera, 2003). As the number of reinsurance companies is quite limited, there is not really available and fully transparent information on the sector. The Financial Stability Forum has expressed some concerns about the lack of transparency in relation to the risk exposure of reinsurers and about the complexity of

these companies (Swiss Re, 2003a). It is then quite difficult to assess the impact of a reinsurer's bankruptcy on primary insurers.

We believe that a few large reinsurers experiencing financial distress could bring risks for counterparties, especially banks and insurers. A reinsurance company which is part of a conglomerate can trigger systemic risk. On the one hand, the bankruptcy of a reinsurer can cast doubts on the creditworthiness of others parts of the conglomerates, a bank or an insurer. On the other hand, the bankruptcy can lead to losses in the balance sheet of the bank or the insurer which may endanger its financial stability. Nevertheless, the risk associated with the failure of one reinsurer is limited by the fact that insurers often depend on several reinsurers. Moreover even the larger reinsurers seldom represent more than 4% of a primary insurer's assets (Swiss Re, 2003a).

### **3.4 Regulation's arbitrage**

With the Basel II regulation, there is a potential arbitrage in bancassurance companies where two types of activities coexist. In the absence of any insurance regulation, shift losses from bank subsidiaries to the insurance subsidiaries could happen. Moreover, a growing volume of risk is transferred from banks to insurance companies. This transfer is an additional reason for a more restrictive regulation of insurers. According to Allen & Gale (2005), this tendency is a regulation arbitrage. Indeed, for the moment, Basel II rules are more restrictive than insurance regulation regarding risk transfers, at least in Europe. Solvency II may eliminate these activities by effectively increasing the cost of selling protection to banks (Santos, 2006).

## **4 The Solvency II Project**

In this global context, a general recasting of the sector is most welcome. The current legislation for the determination of regulatory capital is mainly based on insurance risks. Minimum capital requirements are calculated using simple factors, such as the percentage of technical provisions, premiums or claims. Market or operational risks are nearly absent. Therefore, in 2000, the European Commission launched the Solvency II project, a revision of the prudential regulation aiming to fully reflect the latest developments of the sector. The main objective of the regulation is to protect policyholders. Other aims such as financial stability and fair, stable markets are included in the future regulation. Solvency II is a risk-based economic approach. It aims to take into account assets risks like market risk or asset-liability management (ALM) risk. But the new regime aspires to go beyond quantitative elements and to focus on risk management, governance and information to public. Solvency II is based on a three pillar approach such as the regulation for the banking sector with the Basel II accord.

#### 4.1 Pillar I: quantitative aspects

Pillar I consists of quantitative elements such as determination of economic capital, provisions and investments. Capital requirement is based on a two-level approach.

The *Solvency Capital Requirement* (SCR) is the target capital requirement. It can be calculated using a standard formula or an internal model. The calculation is based on a Value-at-Risk (VaR) approach. VaR is the maximum loss over a target horizon such that there is a low, prespecified probability that the actual loss will be larger (Jorion, 2003). In the Solvency II project, the target horizon has been set on one year and the prespecified probability on 5%. SCR is a 95% VaR approach on a one year horizon. VaR is closely related to actuarial concepts such as probability of ruin and maximum probable loss. All risks are included in the SCR. It comprises six modules representing all the risks an insurer faces: operational, market, default, life, health and non life risks. The SCR should reflect the economic capital of the company taking into account its true risk profile. If a company goes below the SCR, the supervisory authority is informed. The company should then take all the necessary measures to retrieve a solvency situation.

The *Minimum Capital Requirement* (MCR) is a safety level. It is a trigger level under which a company should not go. Otherwise, supervisory authorities can take severe actions going from an intervention in the management actions to the company's closing.

This double trigger system protects shareholders and the top management against a regulatory bias toward excessive interventionism (Plantin & Rochet, 2007). When the company runs as a well-capitalized undertaking, shareholders pilot the top management actions without interferences from the supervisory authorities. Nevertheless, authorities carry on their supervisory activities such as corporate governance compliance or underreserving detection.

When a company goes below the SCR, the company under the regulator's control has to put actions in place in order to recover its solvency situation. The regulator has a control right. This can be justified by the representation hypothesis advocated by Dewatripont and Tirole (1994). The prudential regulator behaves as the current representatives of policyholders. He plays the role of the "banker of insurers" (Plantin & Rochet, 2007). Shareholders and regulators work together in order to correct the issues. This system allows to avoid an excessive intervention of the regulator in the actions of the company. If the company is able to identify and correct the inefficiency in its system, the regulator should not impose an additional burden on the company. The company must disclose a report to the supervisory authorities including the reasons of the difficulties, the action plan and the consequences of the situation. This is one of the goals of the future "Report on solvency and financial condition" that every company will annually disclose to the supervisory authorities.

If, despite these actions, the company goes below the MCR, the regulator would

intervene promptly. At this stage, the actions that the regulator would take are not clear yet. But according to the directive, the regulator would take actions instead of the top management.

The deposit insurance set up in the banking sector partially protects the investors against the failure of a bank. In the same way, can we imagine a duplication of this idea in the insurance sector? This system already exists in some European countries, for example in France. Following the failure of Europavie, the first bankruptcy of a life insurer since World War II, the French government created a life-insurance guarantee fund. This idea would be in agreement with the increasing importance of the insurance sector in the policyholders' every-day life. Most of the population buys non-life products and a growing portion purchases life products. Unfortunately, this system does not seem to be adapted in the coming directive. This guaranteed fund should be funded and run by the insurance sector (Plantin & Rochet, 2007). Then the control rights would be transferred from the policyholders to the sector. The companies would have the incentives to avoid costly failure for the entire sector and to liquidate failing companies when there are no other choices. This could reduce the total failure cost. But a guaranteed fund run by the industry can induce companies to exert power and influence them to liquidate competitors even if the liquidated company has chances to recover. The liquidating companies can see an opportunity to eliminate competitors. This is why we advocate a joint control with the regulatory authorities in order to prevent such behaviours.

Today, Solvency II addresses new issues of capital requirements calculations. Credit, market and operational risks will be included in Pillar I. However, operational risk is taken into account using only simple factors applied on total earned premiums and insurance technical provisions. In spite of a request of industry, standard formula for operational risk is quite basic and not really risk-sensitive. Supervisory authorities argue that they do not have enough data to fine-tune the formula. Nevertheless, the recent frauds showed rationales for a better quantification of operational risks. Moreover, a fall in the equity market can rapidly make unit-linked products lose their allure and hence lead to a drop in their sales. Sharp stock market fluctuations thus lead to considerable volatility of premium income and asset management fees (Swiss Re, 2003b). This translates into operational risk as companies cannot make any substantial changes to their cost structures over the short term. The standard formula for operational risk takes this issue into account. The capital charge for operational risk is based partly on the amount of annual expenses incurred in respect of unit-linked business (CEIOPS, 2007).

The new regulation aims to include the asset side of the balance sheet in the economic capital calculations in such a way that the increasing link between financial markets and insurers would be better measured and controlled. As a consequence, systemic risk could be prevented. In the current regulation, rules regarding invest-

ments such as lists, location, diversification, amounts, etc. were clearly specified in the legislation. In the forthcoming regulation, there are no specific policies concerning these matters. From now on, market risk's aim is to take into account all investments risks and characteristics.

Solvency II aims to comprise evaluation of options and guarantees in the determination of capital requirements. These embedded options and guarantees will be re-considered in the future regulation. Under Solvency I, such features were not included in the solvency margin. In many cases, these options are still difficult to evaluate and even companies are not always able to determine the associated risks. During the 1980s and the 1990s, many companies failed to guarantee promised returns. This indicated that companies did not master the evaluation of new financial risks. Calculations of options, especially the option to surrender, will have to be carried out very carefully. Regarding the computation of options to surrender, companies may assume that the process of surrendering is independent of financial markets and firm specific information (CEIOPS, 2007). We believe that this is not an acceptable possibility for companies. The past failures demonstrated the link between performance of financial markets and waves of surrenders.

Naturally, the riskiest products will be backed with more capital. For instance, the contracts with high volatility of claims or long term life contracts with embedded options and guarantees may need to be backed with more capital. We can fear that insurers will promote contracts with fewer risks for the insurers, essentially unit-linked products or contracts with conditions allowing for adjustment on the policy term. Regarding the unit-linked products, deductions will be calculated in order to take into account the investment risk born by the policyholders. Nevertheless, under the current regulatory regime, the solvency margin is already reduced for such products. The effects on the mix of products offered by insurers will strongly depend on the way these products will impact the amount of capital requirements. The same remark prevails for products with options and guarantees.

At this stage of development, Solvency II seems to penalize equities in comparison with other categories of assets such as real estate or bonds. Therefore, we can expect a decrease in the proportion of stock held by insurers in their investment portfolios.

Liquidity also became a major concern for the insurance sector. Solvency II addresses this issue by introducing a lapse risk in the computation of the SCR. Lapse risk is related to the loss, or adverse change in the value of insurance liabilities, resulting from changes in the level or volatility of the rates of policy lapses, terminations, and surrenders (CEIOPS, 2007). But the regulation should go further by introducing real liquidity indicator besides solvency ratios. The recent subprime crisis proved the rationales for such indicators. Liquidity risk management should be regularly reviewed in line with trends.

Duration and ALM are key points in the liquidity risk management. ALM risk

will be introduced in the future directive. At this stage, Solvency II is quite vague regarding ALM rules and techniques. The European Commission only emphasizes that companies would invest in assets which are appropriate in terms of liquidity and risk profile with the liabilities of the company (European Commission, 2007). With the increasing liquidity of insurance products and the implications for the investment portfolios of insurers, ALM should be at the core of the future developments of insurance companies. Indeed, a higher liquidity of liabilities should be followed by an increasing liquidity of assets. A higher liquidity risk can lead to changes in the proportion of liquid assets such as stocks or short-term bonds held by insurers in their investment portfolios in comparison with illiquid assets.

Larger financial conglomerates, i.e. bancassurance and assurfinance increase the level of complexity and opacity of the business bringing new risks. Moreover, the aggregation of capital measures at the level of the holding company may serve to open new channels for financial contagion and hence, increases the level of contagion risk in the sector. This specific risk has not been covered by the preparatory works on Solvency II yet. However, there is a clear convergence between financial services such as banks, insurers, mutual funds, investment funds, etc. The financial sector needs a regulation system as integrated and as coherent as possible. Clearly the European commission aims to harmonize legislations regarding prudential regulation of different financial sectors. In this sense, the European Commission's action plan for a single market in financial services was adopted in 1999. Some countries such as the United Kingdom went even further. The UK regulator, the Financial Services Authority (FSA) issued an "Integrated Prudential Sourcebook". This sourcebook organizes prudential regulation for all the financial services such as banks, insurance and investments firm. British legislation organizes prudential regulation by categories of risks, and not according to the company status. Such a way of doing is in line with the convergence of the banking and insurance sectors as well as with the emergence of globalized bancassurance companies. Similarly, the structure of Solvency II is inspired by the Capital Requirement Directive, the transposition in European Directive of the Basel II agreement.

The increasing role of insurers as intermediaries of financial risks has led to more complex risk structures, especially risk transfer and off-balance sheet exposures. There is a need for a stronger supervisory focus on financial risks as opposed to underwriting risks. Market and credit risks including credit risk transfer products are not well understood yet by the markets and by the regulatory authorities. These "risk reducers" have also financial risks attached such as counterparty risk. We hope that with Solvency II we will be able to better quantify and analyze credit risk transfer instruments in order to see if they fit the covered risks. Moreover, a lot of the activities of insurance companies in credit derivatives markets were driven by regulatory arbitrage and that Solvency II may eliminate these activities by effectively

increasing the cost of selling protection to banks (Santos, 2006). In the forthcoming Solvency regulation, attention has to be paid to the fact that capital requirements are calculated net of reinsurance. In other words, SCR and MCR will be reduced by reinsurance purchase. We could expect a potential future development of the reinsurance market leading to an increasing systemic risk and a possibility of a retrocession spiral. The retrocession spiral has been mentioned by the Financial Stability Forums as a potential source of risk (Swiss Re, 2003a).

#### **4.2 Pillar II: qualitative aspects**

Pillar II comprises the qualitative elements of the new regulatory regime such as governance, risk management, internal control and supervisory. It also includes risks not countable in pillar I and the evaluation of the quality of the risk transfer, especially the reinsurance. As part of their risk management system, all insurance undertakings should have, as an integral part of their business strategy, a regular practice of assessing their overall solvency needs with a view to their specific risk profile: Own Risk Assessment Profile (European Commission, 2007).

Pillar II aims to encompass a “trust in the market”, a market discipline view, by promoting sound risk management practices and appropriate governance. Pillar II is particularly important for corporate governance issues. Actions of the top management, if unknown by shareholders and by directors, can lead to the insolvency of the company. This is why a concrete and regular implication and knowledge of the directors is fundamental to avoid failure cases like Independent Insurance Company Limited. In this bankruptcy, top management took excessive actions. At the same time, other agents like directors or shareholders did not have the control of the actions’ top management. The pillar II regards all the managing functions into vital activities such as risk management, audit, internal control, etc. The European directive states clearly that the administrative or management body of the insurance undertaking has the ultimate responsibility for the undertaking’s compliance with the Solvency II directive (European Commission, 2007). This puts more responsibility on management than is presently the case.

Management and internal control are the areas causing the majority of insurer financial distresses (Müller, 1997, Plantin & Rochet, 2007). From this point of view, controls, sound and prudent management are far more important than Pillar I. Management errors cannot be compensated by higher solvency requirements. For instance, underestimation of underwriting cannot be covered by higher capital requirements. The only way to tackle this problem is, again, a strengthening of the internal control of management actions on the liabilities, especially in long-tail businesses like the life sector or liability risk in the non-life sector. Capital requirements alone are not sufficient to control companies. Actuarial and statistical analysis of risk is not the only

way to keep an insurance company solvent. Governance, risk management, systems and control, i.e. Pillar II, are high priorities.

Pillar II focuses also on the roles of supervisory authorities. One aim of the European Commission is to harmonize the European market by strengthening cooperation between European regulators. This question is essential in the case of insurance or bancassurance groups spread in different countries. In the case of Europavie, a reason of the failure seems to be the lack of full cooperation between German and French regulators (Plantin & Rochet, 2007). Conglomerates have often more opaque accounts. This example shows the rationale for an harmonized and cooperative regulation system.

### 4.3 Pillar III: Information disclosure

Pillar III is devoted to information and reporting to policyholders, investors, employees or supervisory authorities. The policyholders' protection is at the cornerstone of the Solvency II regulation. In order to get around the asymmetry of information issues, policyholders have to receive as much information as possible. In addition, clear and available information is the key point regarding the triggering of a potential insurance run. Information systems tend to avoid causes for rumours and panics that are often at the source of contagion effects threatening financial stability.

The insurance sector is in general less transparent than other sectors. One of the reasons may be that current insurance regulation is focused on the policyholder protection and less on how companies deal with their risks. The growing use of credit risk transfer instruments and the convergence between insurance sector and capital markets make the insurance sector more complex. Higher disclosure and transparency of financial risks and how they are managed is becoming increasingly necessary. In this sense, the coming IFRS norms have the same disclosure objective. Life insurance is still an opaque business. While the portfolio composition of mutual funds, for instance, is very transparent and the funds are marked-to-market on a regular and frequent basis, the portfolio composition of the general account of a life insurance company is far less transparent (Briys & De Varenne, 2001). The Financial Stability Forum (Swiss Re, 2003a) has also expressed some concerns about the lack of transparency in relation to the risk exposure of reinsurers. It raises the probability of overreactions to bad news about the reinsurer (e.g. premature termination of treaty).

Polonchek and Miller (1999) showed a different market perception to an equity issuance before and after 1990. Before 1990, policyholders and shareholders were relatively uninformed about the asset quality of insurers, especially life insurers. After 1990 and the asset write-downs, a change happened in the reaction of the market to an equity issuance. No-cross effects occurred. The investors were better informed on the asset quality. These results speak in favour of a transparent public reporting.

Investors must be confident in insurer's portfolios. Consequently, they could not interpret an equity issuance as an adverse signal on asset quality of all insurers.

Under the Solvency II regulation, insurance companies will be required to publicly disclose, on an annual basis, a "Report on their solvency and financial condition". That report will contain, among others things, the following elements: a description of the system of governance and an assessment of its adequacy for the risk profile of the company, a description, for each category of risk, of the risk exposure, concentration, mitigation and sensitivity and a description of methods used for the valuation of assets and liabilities (European Commission, 2007). This should be sufficiently complete to allow policyholders and investors to have a deep overview of the company. In particular, we hope that methods used for the valuation of options, guarantees and risk transfer will be clearly explained and justified. Nevertheless, supervisory authorities will permit companies not to disclose information if the competitors can gain significant undue advantage.

## 5 Conclusions

The insurance sector is undergoing significant changes being increasingly linked to the banking sector and selling products that often have large similarities with savings products offered by banks. Within a few years, insurance companies became major actors on financial markets. Moreover, financial innovations such as derivatives contracts have radically modified the investments portfolios, increasing the complexity of financial companies.

Recent developments faced by insurers modified the risks encountered by the sector, especially liquidity risk and systemic risk. The introduction of new options in life insurance products increases the liquidity of liabilities. The banking-type products introduced maturity mismatches between assets and liabilities, a new exposure for traditional insurance companies. At the same time, since assets of insurers are partially illiquid like real estate, loans, private equity and long-term bonds, an insurance company is subject to liquidity risk. The insurance industry could face a risk of insurance run. The increasing blurring of the boundaries between insurance and other financial institutions, especially in the OTC derivatives market, implies a heightened importance of the insurance industry for systemic financial stability and calls for a stronger supervisory focus on financial risks. Furthermore, the increasing dependence between financial markets and insurance companies could be a danger for the entire economy in case of a large failure of the sector.

In respond to an increasingly complex financial service market, the European Commission launched in 2000 the project Solvency II. Similar to the European banking regulatory framework known as Basel II, a three-pillar structure for solvency

regulation will be implemented by 2011. Solvency II is a risk-based economic approach.

A number of conclusions can be drawn from the discussion about regulation and Solvency II. The purpose of the discussion presented here has been to outline the specificities of Solvency II, as it is currently discussed to provide an appropriate response to the changing needs of insurance regulation. Today, Solvency II seems to address new issues faced by the insurance sector. For instance, credit, market and operational risks will be included in the calculations of the regulatory capital. However, in other specific areas such as evaluation of options and guarantees, risk transfer, financial conglomerates, operational risk or liquidity risk, caution is warranted. All these subjects could have potential impacts on the sector, consequently on the economy.

Currently, Solvency I is based only on quantitative elements. Meanwhile, qualitative matters such as corporate governance or risk management are not taken into account. Hopefully, Solvency II aspires to go beyond Pillar I. Pillar II aims to encompass a “trust in the market”, a market discipline view, by promoting sound risk management practices and appropriate governance. Management and internal control are the areas causing the majority of insurer financial distresses. From this point of view, controls, sound and prudent management are far more important than Pillar I. Attention has to be paid to asset-liability management, corporate governance issues and determination of the risk transfer quality.

Finally, the insurance sector is in general less transparent than other sectors. Higher disclosure and transparency of financial risks and how they are managed is becoming increasingly necessary. Indeed, the rising complexity of insurance products, risk transfer mechanisms and internal models impose a higher level of transparency. Crucially, organisations must also develop the internal processes and systems to produce this objective. To date, Pillar III has not been debated in depth.

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