

Solvency II and the investment policy of life insurers: Some homework to do for the sales and marketing departments

Norman Rudschuck

Norddeutsche Landesbank, Hannover, Germany

Tobias Basse

Norddeutsche Landesbank, Hannover, Germany

Alexander Kapeller

Norddeutsche Landesbank, Hannover, Germany

Torsten Windels

Norddeutsche Landesbank, Hannover, Germany

Abstract

Firstly we will examine some basic principles of Solvency II. Secondly we will briefly discuss asset pricing models focussing on stock markets and show that equity prices are closely related to economic fundamentals and identifying stock crashes as rather seldom events than normal phenomena. We will show by applying consumption based capital asset pricing model (CCAPM) that future return expectations of mainly equity investors (mutual funds) can not be anticipated to be as low as historical records have shown within the last decade, biased by two major severe stock shocks. Solvency II will change the paradigms of risk and asset management in the European insurance industry. We believe that the new set of regulations will force life insurers to reduce their exposure to equities. This will definitely be a problem for asset managers in insurance companies; in combination with the low level of interest rates to be observed at the moment a permanent reduction to the equity quota will almost certainly result in rather unpleasant returns – especially in comparison to the performance of fund managers at mutual funds who face less constraints investing in equities.

Keywords: Solvency, risk and asset management, insurance

Introduction

Solvency II is to be considered a paradigm shift for the European insurance industry and will lead to major changes in the process of asset and risk management. This new set of regulations is necessary. In fact, we believe that the current financial crisis has shown the importance of such advanced risk management processes in the financial services industry. The so-called subprime mortgage crisis obviously did have massive negative effects on capital markets and global economic growth. As a consequence, not

only the stocks of banks and insurers dropped considerably; the equity market in general suffered huge losses. Finally, it was the unblamable general public to carry the burden. Stocks have recently been not the best investments compared to other asset classes, e.g. German 10 year government bonds. Easily to understand, a reform of financial market regulation in general and insurance authority in special had to be undertaken. Taking into account Solvency II, which will require that equity investments have to be underlain with an extra amount of solvency capital, it seems to be very

probable that insurers will permanently reduce their equity exposure. As a matter of fact, insurance companies are lacking equity capital anyway and have problems to fulfil upcoming Solvency II capital requirements. However, having lately seen quite a recovery after the lows of March 2009, there may still be some potential for further gains in stocks. This could become a problem for asset managers in the insurance industry. Low interest rates even seem to increase these difficulties because life insurers will have a hard time trying to produce attractive returns in a post Solvency II world – especially compared to mutual funds. This is wanted by the regulators; Solvency II is above all supposed to protect the customers. Therefore, our objective is to show that life insurer will face a disadvantage in terms of return in comparison to mutual funds caused by Solvency II. Consequently, insurers especially have to do some rethinking of marketing strategies trying to sell endowment policies in the new regulatory environment.

The organisation of the paper is as follows: Firstly we will examine some basic principles of Solvency II. Secondly we will briefly discuss asset pricing models focussing on stock markets and show that equity prices are closely related to economic fundamentals and identifying stock crashes as rather seldom events than normal phenomena. This sheds light on future return expectations of mainly equity investors (mutual funds) and investors under the Solvency II regime (life insurers). This in mind we will suggest appropriate financial services marketing strategies from a Solvency II perspective before concluding.

Regulatory way to Solvency II

Almost at the end of the actual Solvency II implementing process, the subprime mortgage crisis shook the financial system. It became obvious, that rules were misused or at least extended to their limits into certain grey areas, and re-thinking of applicable regulations had to be done. The crisis has shown the importance of rethinking risk management highlighting the

importance of Solvency II. Romeike et. al. (2006) consider Solvency II to be a paradigm shift for the insurance industry including major upheavals for corporate-policy decision processes. Regarding Basse and Friedrich (2008) it is already foreseeable that capital requirements will be tightened according to Solvency II, especially due to a very comprehensive risk definition including underwriting and market risks. More refined tools will be needed in this new regulatory framework to face interest rate risks on both sides of the balance sheet in an integrated asset-liability-approach. As a matter of fact, any effort undertaken by life insurers to encounter these risks could easily lead to a stronger demand for long term fixed income securities. Insurance companies lack of equity capital, so Reddemann et. al. (2010) have argued convincingly that besides different other measures, dividend cuts might increase their capital base. Unlike bank-related regulations, in particular Basel I and Basel II, Solvency II is a European objective. It is one of the major projects in the field of financial services regulation at the EU level. The ongoing process of implementing identical requirements for all European insurance companies is quite sophisticated and will be implemented 2012 or 2013 the latest into member state law. The goal is to introduce and establish for the first time economic risk-based solvency requirements across all 27 EU Member States. This new set of regulation will be more risk-sensitive and more accentuated than Solvency I, thus enabling a better coverage of the economic risks run by any particular insurer.

In contrast, the previous set of regulations is known as Solvency I, which has specified the solvency margin in the 1990s. Nevertheless, the focus thus far still lies on exactly this solvency margin, meaning the amount of regulatory capital an insurer is obligated to hold against unexpected events. These requirements have been in place since early 70s of the last century and were reviewed again during the 1990s. A limited reform was agreed by the EU-Parliament as well as the Council in 2002, leading to the well known reform,

namely Solvency I. Nowadays, Solvency II is somewhat similar to the banking regulations of Basel II, this is why people tend to call it "Basel for insurers". Others, like Schubert et. al. (2004), enunciate it formula wise Solvency II = Basel II + X, meaning Solvency II will be based on Basel II – but further developed. For example, the proposed framework has in both cases three main pillars or fields, namely pillars 1 to 3. The first one consists of quantitative requirements (e.g., the amount of equity capital an insurance company should hold). The second pillar sets out the necessity for the risk management as well as governance of insurers combined with rules for the effective supervision of insurers. Pillar 3 focuses on requirements concerning disclosure issues and transparency.

As already mentioned, the first pillar outlines quantitative issues. Rules to evaluate the balance sheet are mainly in the focus, especially technical provisions and own funds actually held. The regulatory Solvency Capital Requirement (SCR) can be calculated either by applying a compulsory standard formula or an developed internal model, which has to be accepted by the regulators. Additionally, the Minimum Capital Requirement (MCR) refers to the last threshold for the solvency capital that has to be held. Falling below this lower limit would result in intervention of the authority and may lead to the withdrawal of the undertaking's authorisation. Pillar 2 deals with qualitative requirements for all undertakings and regulatory authorities. Insurers must be able to state their positions concerning risk strategy, an appropriate organisational and operational structure, an internal management and control system as well as their audit function. Regarding the differences between small insurers and global players, the principle of dual proportionality applies accordingly: even though there will not be a "one size fits all"-solution, same principles apply to all undertakings; but in each and every case the applying way must be tailored to the insurer's business model. Additionally, the Supervisory Review Process (SRP) must also be in line with the so-called principle of proportionality as well.

The third pillar deals with public and the supervisory disclosure requirements. Gaining in importance are qualitative statements, especially regarding the insurer's strategy, risk management as well as usage of either the prescribed or internal model. Hard facts, like quantitative solvency capital requirements, must be published, too.

Examples to point out the changes of solvency capital requirements might help to understand the new world order. Solvency II is supposed to reduce the insurer's risk to be incapable when it comes to customer claims; to absorb costs by policyholders in the case an insurer is unable to meet all claims fully; to implement supervisors early warning so intervention can promptly be made if required equity capital falls below a certain level; and to restore confidence and financial stability of the insurance industry. Many European states (e.g. Germany, Switzerland, etc.) have declared the current minimum requirements for insufficient and have already implemented their own reforms (e.g. MaRisk VA, Swiss Solvency Test, etc.), accordingly leading to a dissatisfactory situation where there is a rag rug of regulatory requirements all across Europe. This definitely puts constraints on developing a standardized Europe-wide market. As a matter of fact, Solvency II is driven with the objective of developing and facilitating a European Single Market in insurance services the EU legislation but not with the price of losing sight regarding consumer protection. To develop new rules of regulation, four quantitative impact studies (QIS 1-4) have already been undertaken, the fifth study will be run between August and mid-November 2010. Participation was voluntarily at all stages, each undertaking business – life, non-life and reinsurance – had to report to their national supervisors before the results were consolidated and evaluated. Methodologies, simulation models and calculations were re-calibrated, developments were taken into account as well as solo results were considered differently as group results, etc.

Nonetheless, the exception proves the rule. France has drawn particular attention to the fact that their local insurance companies have a very different business model. Especially, the French government does not want to lose the insurance companies as investors at the Paris Stock Exchange (Euronext). The companies have the allowance to smoothen their stock investments over several years rather than evaluate them year by year with the implications of depreciations.

Notwithstanding all major upheavals as well as paradigm shift for the insurance industry, Solvency II is useful and necessary together. But which impacts do future regulations have for the customers? Will insurance clients have the same product? As briefly outlined, insurers have to underlay risky investments with equity capital. This has to be done for both interest mismatch and shares. The problem for insurers will be their lack of equity capital, especially for non-life insurers. Their actual option can only be, to reduce risky investments. Consequently, this implies that customers can only expect lower future returns, but with a higher security level. This fact necessitates an appropriate communication strategy to convince the customers to still sign insurance contracts with more safety but less expected return.

Stock markets: Risk, return and economic fundamentals

We will show by applying consumption based capital asset pricing model (CCAPM) that future return expectations of mainly equity investors (mutual funds) can not be anticipated to be as low as historical records have shown within the last decade, biased by two major severe stock shocks. This results (*ceteris paribus*) in a lower return of investments in life insurances in comparison to equity investments.

As already noted, the so-called subprime mortgage crisis has had massive negative effects on global economic growth and has simultaneously pushed down stock prices and

government bond yields. Focussing on data from the European Monetary Union (EMU) investors had to witness that the Euro Stoxx 50 – a very popular benchmark for asset managers – fell below the mark of 2.300 points in March 2009 while 10 year government bond yields in Germany dropped to about 3%. After the bursting of the dot-com bubble this was the second stock market crash whilst one decade. Consequently, equity investors hoping for high returns have in general been disappointed since 2001. As a matter of fact, examining the data sample January 1999 to December 2009 the mean stock market return in the EMU was lower than the mean return on German government bonds - still bonds obviously were less risky (figure 1). This period is very popular among financial econometricians in order to avoid possible structural breaks due to the introduction of the Euro in January 1999. The mean return of European stocks (M/M) is calculated based on the performance of the Euro Stoxx 50 total return index. Our gauges of the performance of bond investments are the mean returns on the broad REXP and on the REXP 10 years (which only includes German government bonds with a maturity of 10 years). Risk is measured by the standard deviation of returns.

The results reported in figure 1 may be a major surprise at first sight. However, there is a simple explanation which already has been discussed: Two stock market crashes within the last decade (figure 2).

Economic theory does suggest that equity markets are highly volatile so that pronounced drops of share prices are always possible. Therefore, there should be a high risk premium. In fact, analysing long term trends does show that equity returns seem to be too high in order to be explained by some asset pricing models. This is especially true for the consumption based capital asset pricing model (CCAPM), which tries to explain stock returns by the consumption of economic agents. Assuming reasonable levels of risk aversion among economic agents consumption expenditures in the U.S. and other

countries are simply not volatile enough to determine stock prices. This is the so-called equity premium puzzle (e.g. Mehra and Prescott 1985, Kocherlakota 1996). Stock market crashes have been suggested to solve this puzzle. However, dramatic events are needed to explain the high return on equities in the last 50 to 200 years (e.g. Rietz 1988, Mehra and Prescott 2003). The two crashes to be observed in the last decade are quite clearly no sufficient solution to the equity premium puzzle.

Taking an empirical perspective Campbell and Cochrane (2000) argued convincingly that the simple Capital Asset Pricing Model (CAPM) performs better than the more complex consumption based asset pricing model. According to the CAPM there is a strong relationship between risk and return. Therefore,

investors ought to expect that the ex ante equity premium will be positive. Phrased somewhat differently, the negative ex post equity premium reported in figure 1 most probably is the result of bad luck! Similar discussions took place when the dot-com bubble was about to burst. Diamond (2000), for example, discussed stock market return projections evaluating proposals to reform the U.S. social security system that involved equity investments. He noted that stock prices were relatively high at that point of time and argued that – as a consequence – the assumption of a 7% p.a. real return and a 4% p.a. equity premium seemed to be ambitious. In this study he suggested a number of different possible scenarios favouring a correction that would subsequently allow a 7% real return thereafter.

Figure 1: Risk and Return (M/M) – Equities versus Bonds 1999-2009

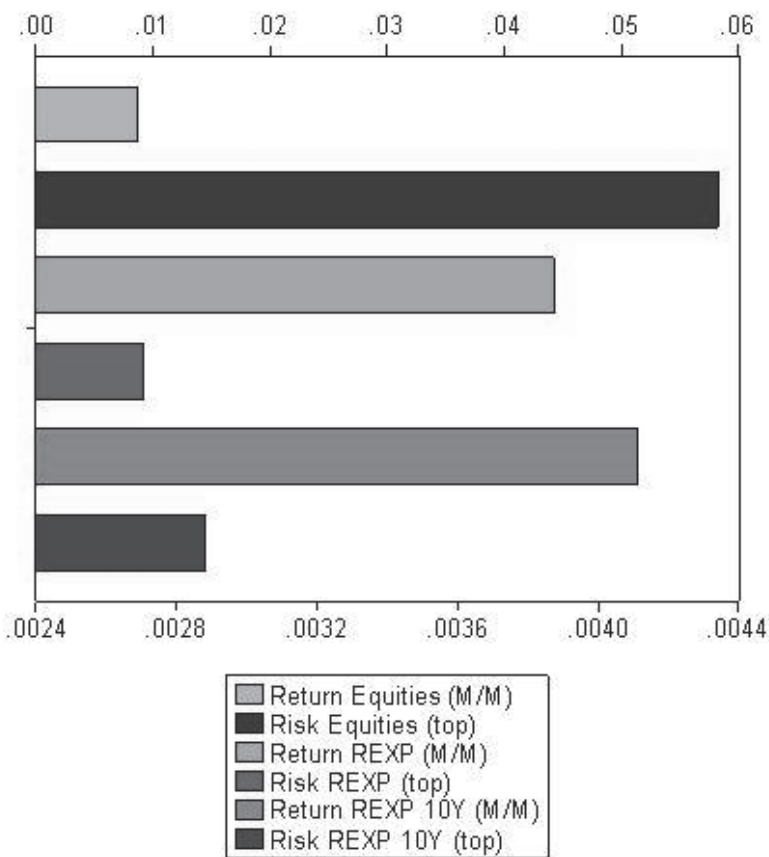
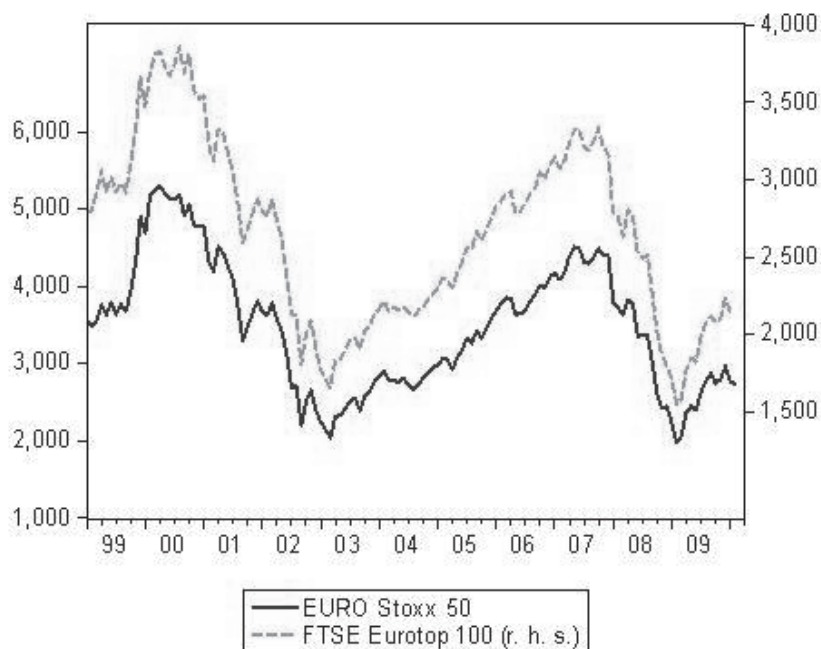


Figure 2: European Equity Markets



While the recent historical experience quite clearly does suggest that stock market crashes are a phenomenon of economic relevance most financial economist seem to believe that stock prices in the long run are governed by economic fundamentals. This assumption has recently been challenged by Boldrin and Peralta-Alva (2009). At this point, a model is needed to explain the fundamental value of equities. It is quite usual to note that the level of stock prices today is determined by future expected dividend payouts (e.g., Diamond 2000, Boldrin and Peralta-Alva 2009). More precisely, the present value model predicts that stock prices in period t SP_t are given by:

$$SP_t = \sum_{\tau=1}^{\infty} \frac{E(D_{t+\tau})}{(1+R_t)^\tau}$$

where $E(\square)$ is the expectations operator, D_t are the dividend payouts in period t and R_t is the required return. In order to use this model to predict stock prices assumptions about future dividend payouts and the required rate of return

on equities have to be made. Different assumptions do have major consequences for the resulting “fundamentally” justified stock prices. Most notably, Gordon (1959) suggested assuming that dividends grow at a constant rate g . Combined with the assumption that the required rate of return on equity is also time-invariant this leads to a very simple version of the model:

$$SP_t = \frac{D_t(1+g)}{(R-g)}$$

Based on this model Boldrin and Peralta-Alva (2009) have argued that there is no clear tendency of stock prices to revert to the well-established fundamentals in the long run. Analyzing data from the U.S. and using Gordon’s version of the present value model they have assumed that R is 7% p.a. and that g is 3%. Their methodology of just comparing the results of the present value of dividend payouts with the market value of equities is simple but very plausible. Noting that the model may miss some short term fluctuations of the stock market they have focused on low frequency movements of stock prices

using the Hodrick-Prescott filter. Their results seem to imply that dividends cannot explain the movements of stock prices. This is especially true after 1992. In fact, they have shown that dividend growth did not have a specific trend in the period 1992 to 2008 while stock prices have increased sharply. Following their methodology we examine the European stock market focusing on the post-1992 experience. Our measure of stock market activity is the FTSE Eurotop 100 index which is a modified capitalization weighted index of the 100 most actively traded and highly capitalized stocks in the European equity market. Stock prices and the data on dividends per index share are from Bloomberg. Our results (figure 3) are by far less discouraging. Contrary to the U.S. data set examined by Boldrin and Peralta-Alva (2009) the time series at least seem to follow similar trends.

At this point it may be helpful to use more sophisticated techniques of time series analysis. In order to do so we examine quarterly data on stock prices and dividends per index share (again focussing on the FTSE Eurotop 100) from 1993/I to 2009/IV. The dividend time series is seasonally adjusted. According to ADF-tests (not reported) both variables seem to be non-stationary and integrated of order one. Given this result, we test for cointegration among dividends and stock prices. By definition, two time series integrated of order one are cointegrated when there is a linear combination of these variables that is stationary. The existence of a cointegration relationship between two time series indicates that the variables share a common stochastic trend and – as a consequence – that there is a close equilibrium relationship between them. In other words, finding empirical evidence for the existence of a cointegration relationship among dividends and stock prices would imply that the market value of equities in the long run is closely linked to the economic fundamentals. The procedure suggested by Johansen (1991) is used to test for cointegration among the variables examined here. This test is based on the econometric technique of vector autoregressions (VAR). Here y is a vector of m possibly non-

stationary variables and A_i is a $m \times m$ matrix (with $i = 1, \dots, n$):

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_n y_{t-n} + u_t.$$

The error term u_t is assumed to be a serially uncorrelated random variable. Rearranging the equation yields:

$$\Delta y_t = (A_1 - I)y_{t-1} + A_2 y_{t-2} + \dots + A_n y_{t-n} + u_t,$$

$$\Delta y_t = (A_1 - I)\Delta y_{t-1} + (A_1 + A_2 - I)y_{t-2} + \dots + A_n y_{t-n} + u_t,$$

$$\Delta y_t = \prod_1 \Delta y_{t-1} + \prod_2 \Delta y_{t-2} + \dots + \prod_n y_{t-n} + u_t =$$

$$\sum_{i=1}^{n-1} \prod_i \Delta y_{t-i} + \prod_n y_{t-n} + u_t,$$

where:

$$\prod_i = - \left(I - \sum_{h=1}^i A_h \right),$$

$$\prod_n = - \left(I - \sum_{i=1}^n A_i \right).$$

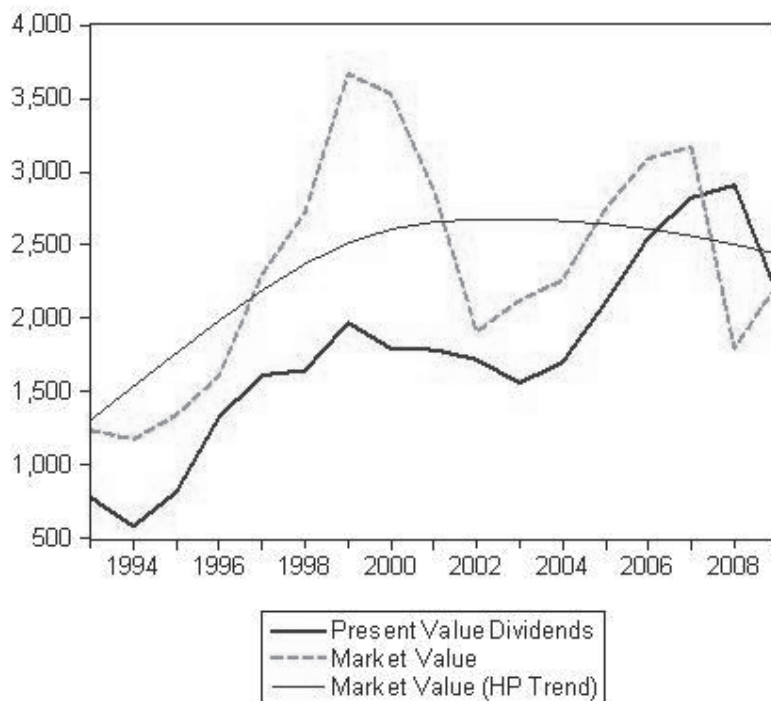
The rank of the so-called long run impact matrix \prod is crucial. In fact, there are k cointegration relationships among the variables examined exist when the rank of the matrix \prod is $k < m$. T is the number of observations. Johansen (1991) has suggested two tests to determine the rank of \prod . While the trace statistic tests the null hypothesis that there are at most k cointegration relationships the max eigenvalue statistic tests the null hypothesis that the rank (\prod) = k is against the alternative that the rank (\prod) = $k+1$:

$$\text{Trace Stat} = -T \sum_{i=k+1}^m \ln(1 - \lambda_i),$$

$$\text{Max Eigen Stat} = -T \ln(1 - \lambda_{k+1}).$$

Including four lags and assuming that the data in levels and the cointegrating equations have linear deterministic trends there is clear evidence for cointegration between the two variables (table I). We have used the critical values provided by MacKinnon et al. (1999).

Figure 3: Present Value of Dividends versus Share Prices



After estimating the model we have analysed the residuals. A Portmanteau test is not able to reject the null hypothesis of no residual autocorrelation up to 16 lags (p-value 0.2864). This information – which is obviously interesting per se – does also have implications for the number of time lags considered in the model. While there may be some criteria suggesting a higher number of time lags the residuals already seem to be random variables considering only four time lags. This result and the now popular tendency to parsimonious econometric modelling quite clear speak for our model specification. In fact, given the rather limited number of data points available (1993/I to 2009/IV) parsimony is of special importance in order to preserve degrees of freedom. Hargreaves (1994), for example, performed Monte Carlo experiments indicating some difficulties with a small sample bias using the Johansen test procedure with less than 100 data points. However, he has also noted that it is

a common practice in applied econometrics to work with sample sizes of about 50 observations.

Summing up, the empirical evidence reported in this section does indicate that stock prices at least in the long run are closely linked to the economic fundamentals. This finding does imply that speculative bubbles are the exception rather than the rule. Therefore, past equity returns – which have been depressed by two stock market crashes in the last decade – are not necessarily a good guide to forecast future returns. Phrased somewhat differently, economic agents ought to expect a positive ex ante equity premium for the next ten years. This prediction is also supported by the simple CAPM which postulates the existence of a close relationship between risk and return. In the current market environment – which is characterized by low interest rates – asset managers in the life insurance industry do face the problem that they will not be able to generate attractive returns. This will most probably especially be true in comparisons to fund

managers at mutual funds because Solvency II will force life insurers to permanently reduce their exposure to equities. Mutual funds are less constrained. While low equity quotas recently have create no performance problems because of the negative ex post equity premium this will not necessarily be the case in the coming years. Quite to the contrary, there are good reasons to believe that the ex ante equity premium is going to be positive again. In this case asset managers at life insurance companies will most probably not be

able to produce as attractive returns as mutual funds. In other words, the characteristics of endowment policies will change in the post Solvency II world. As prescribed by the regulators this financial product will quite clearly generate lower returns – but will also be less risky. Asset managers in the life insurance industry most probably will not be able to solve this problem – so there is some homework to do for the sales and marketing departments!

Table I Testing for Cointegration among Dividends and Stock Prices

Sample (adjusted): 1994Q2 2009Q4

Trend assumption: Linear deterministic trend (restricted)

Lags interval (in first differences): 1 to 4

Trace Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Stat	0.05 Critical Value	Prob.
None *	0.272692	26.97485	25.87211	0.0364
At most 1	0.103957	6.915281	12.51798	0.3534

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Max Eigenvalue Test

Hypothesized No. of CE(s)	Eigenvalue	Max Eigen Stat	0.05 Critical Value	Prob.
None *	0.272692	20.05956	19.38704	0.0399
At most 1	0.103957	6.915281	12.51798	0.3534

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Marketing the “new” financial product

When talking about introducing new products, the academic literature offers theoretical well developed and sometimes also practical proven recommendations how product manager should structure the new product process (e.g., Meffert 2005, Cooper and Edgett 1996). This process involves more or less the following steps:

1. idea generation,
2. quick and dirty research, which leads to a first “kill or go” decision,
3. in-depth market study, which covers both, customer and competitors, and yields in a detailed business case,
4. the decision by senior manager to introduce the new product,
5. development of prototypes,
6. conducting first field trials and refinement of the product,
7. validating the final product through preference tests or even test market simulations,
8. the “go to launch” decision which leads to the
9. final market rollout.

Solvency II will cause life insurers to change their investment policies. This will affect the product endowment life insurance. Considering the situation for endowment policies in the post Solvency II world the situation obviously differs from the new product process discussed above, because steps 1) through 3) are distinct. Phrased somewhat differently, there is no new product but just a significant change to the regulatory environment governing existing life insurance policies. Life insurers are in need to alter their asset allocation according to the new law. Given that interest rates are low this new investment

strategy will certainly result in less attractive returns. Describing the situation from a change perspective, the customers in the pre Solvency II world can be classified as investors who want attractive returns at modest levels of risk. This is characterised by the square on the portfolio curve. By changing the product structure, the dot symbolises endowment policies after the implementation of Solvency II. Accordingly, customers will face a situation with lower returns and, of course, lower risk. Life insurers are consequently confronted with the situation that the product characteristics have changed but not the customer preferences. So the question, which is often day-to-day practice, is “How to sell the “new” product, which has already its main characteristics fixed?” Two strategies will be outlined: First, the shift of customer-preferences and second, targeting right customers.

The well known school of behaviourism (e.g., Watson 1919, Skinner 1971, Zimbardo et. al. 2007) developed the basic explanation for most today’s advertising campaigns through the stimuli response (SR) model. This SR-Model describes a clear causal structure between the stimuli perceived and the action resulting in open behaviour. Modifying this theory, Woodworth introduced the element of the organism, which describes internal states of the individual that influence the straight S-R connection (see Woodworth 1921). Following this, marketers make use of the so called S-O-R model to describe buying behaviour. The neo-behaviouristic S-O-R model is preferred to other buyer-behaviour models (e.g., Blackwell et. al. 2001, Howard and Sheth 1969) because of its less complex but more flexible approach. Elements are the stimulus (S), the organism (O) and the response (R) of the buyer. The stimulus contains marketing (e.g., insurance advertising) and environmental factors (e.g, the breakdown of Lehman Brothers), which are directly observable. Organism describes the influence within the individual human, and helps to explain different outcomes of the same stimuli.

Figure 4: S-O-R Paradigm

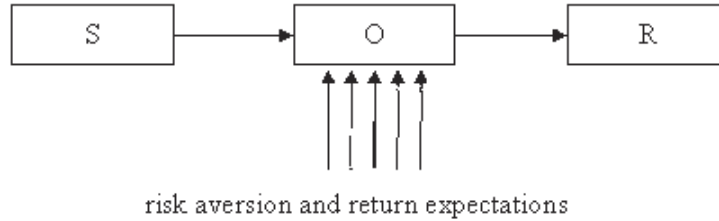


Figure 5: Shift of Preferences

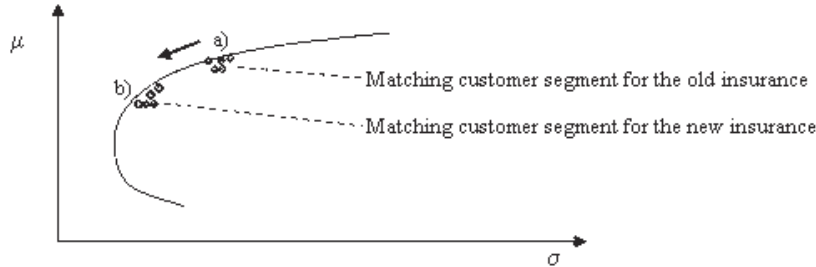
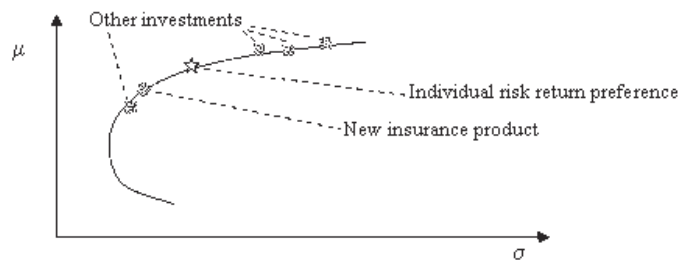


Figure 6: The Individual Investment Portfolio



The individual preferences which are influenced by e.g. culture, peer groups, education, or risk aversion and return expectations, act as intervening variables for the causal structure S O R. Intervening factors are not direct observable therefore often described as a “Black Box” and known as theoretical constructs. The response is again observable and describes e.g. buying a specific insurance, volume, or fee paid. Using only different advertising to make consumers buy the new insurance product will not be sufficient, because only those with suitable risk aversion and return expectations will match with the post Solvency II endowment policy. Not talking about ethics, a supplier wants to make consumers buy his product. Therefore a shift in consumer preferences, inherent in the organism, is necessary. The agenda for the product manager is not only advertising the endowment policies in the post Solvency II world, it includes also

educating the crowd, that the new characteristics are superior which makes the buy a “good deal”.

Figure 5 describes this task by showing the needed shift of preferences from a) (pre Solvency II world) to b) (post Solvency II world).

Considering the atmosphere after the peak of the financial crisis, the image of speculative investments is badly damaged and trust seems to be lost (see Gounaris and Prout 2009). On this basis, using testimonials and well trained sales personnel, advising potential customers to focus on investment risk, the insurance industry might find a way to change the preferences of the individual organism. Prospect theory shows that the human inherent risk adversity and the predominate insecure economic environment will also support the switch to a more security-wishing investor (e.g., Kahneman and Tversky 1979, Tversky and Kahneman 1992).

But is this strategy made for long term success? First, is there no possibility that the customer's mental state, reflecting the consequences of losses during the financial crisis, if not self-experienced, at least witnessed via the yellow-press, is only temporary? And after selling the low risk product, which of course are long term contracts including front-up costs for the investor caused by fees, would not there be complaints that the financial industry is still selling the "product of the week". Finally the insurance industry could again damage its reputation, pushing the post Solvency II product whether it really fits the customer or not, by using manipulative advertising strategies. To avoid this, a second approach will be outlined now. As the first approach does not pay attention to customer heterogeneity, as all investors are receivers of the marketing campaign, the second approach focuses on targeting the right customers. It is characterized by paying attention to the individual preference orientation and works on the investment level of the individual subject, whereas the former approach deals on an aggregated crowd level. Market segmentation is seen as method for identifying different customers groups. Several methods have appeared to build these segments, which require to have intra-segment homogeneity and inter-segment heterogeneity, and will not further be discussed here (see Wedel and Kamakura 2003). The main task is to identify the individual preference structure, classify the customer and consequently find the right product that matches his preferences. But acting like this, only the customers with preferences b) in figure 5 will be addressee of the selling campaign, leaving out customer a). This can be a selling opportunity for other products. But there is already a way out of the dilemma, not having the right product for specific customers. Making use of the Markowitz Model on an individual basis financial counsellors can identify the individual risk return preference (see Markowitz 1952). By doing so, the post Solvency II endowment policies can also be sold to customers with a differing risk return preference.

This of course requires investment in the individual customer relationship, increases counselling effort and needs the generation and provision of individual customer data. The usage of data-mining tools for analysing customer investments can be seen as a good starting point. Integrated financial companies, which sell banking products as well as insurance products, have the advantage of utilizing the customer investment information they already have. Adaption of conjoint measurement methods during individual guidance can be used to identify customer preferences not only for developing new products, but also for segmentation purpose within a financial service setting (DeSarbo et. al. 1997, Arias 1996, Teas and Dellva 1985). This preferences can then be utilized to cross check with the actual investment strategies followed by the customer thereby opening opportunities to sell post Solvency II world endowment policies even if they on there own do not fit the customer preferences. This approach is in comparison to the "shift of preferences" a by far more customer oriented approach and promises higher agreement of the investors also in the long run.

Conclusion

Solvency II will change the paradigms of risk and asset management in the European insurance industry. We believe that the new set of regulations will force life insurers to reduce their exposure to equities. This will definitely be a problem for asset managers in insurance companies; in combination with the low level of interest rates to be observed at the moment a permanent reduction to the equity quota will almost certainly result in rather unpleasant returns – especially in comparison to the performance of fund managers at mutual funds who face less constraints investing in equities. Given today's market environment asset mangers in the life insurance most probably will not be able to solve this problem. We think that the life insurance industry will be forced to reposition the product endowment life insurance. This will mainly be the

task of the sales and marketing departments. Quite clearly, the European life insurance industry will have to explain to customers that the characteristics of one of its most important products is about to change by deemphasising the factor attractive return and focusing more strongly on the factor low risk. In this paper we have discussed two possible strategies – namely “shifting customer preferences” and “targeting the right customers” – to sell endowment policies in the post Solvency II world.

References

- Arias, J.: Conjoint-based preferential segmentation in the design of a new financial service International Journal of Bank Marketing, 14 (1996), 3, pp. 30–32.
- Basse, T. / Friedrich, M.: Solvency II, Asset Liability Management, and the European Bond Market – Theory and Empirical Evidence, Zeitschrift für die gesamte Versicherungswissenschaft, 97, (2008), pp. 653-661.
- Blackwell, R./ Miniard, P./ Engel, J.: Consumer behaviour, Fort Worth (2001).
- Boldrin, M. / Peralta-Alva, A.: What Happened to the U.S. Stock Market? Accounting for the Past 50 Years, Federal Reserve Bank of St. Louis Review, 91, (2009), pp. 627-646.
- Campbell, J. Y. / Cochrane, J.: Explaining the Poor Performance of Consumption-Based Asset Pricing Models, Journal of Finance, 55, (2000), pp. 2863-2878.
- Cooper, R. G./ Edgett, S. J.: Critical Success Factors for New Financial Services, Marketing Management, 5 (1996), 3, pp. 26–37.
- DeSarbo, W./ Ansari, A./ Chintagunta, P./ Himmelberg, C./ Jedidi, K./ Johnson, R.: Representing heterogeneity in consumer response models, Marketing Letters, 8 (1997), pp. 335–348.
- Diamond, P. A.: What Stock Market Returns to Expect for the Future?, Social Security Bulletin, 63, (2000), pp. 38-51.
- Gordon, M. J.: Dividends, Earnings and Stock Prices, Review of Economics and Statistics, 41, (1959), pp. 99-105.
- Gounaris, K./Prout, M.: Repairing Relationships and Restoring Trust, Behavioral Finance and the Economic Crisis, Journal of Financial Service Professionals, 63 (2009), 4, pp. 75–84.
- Hargreaves, C.: A Review of Methods of Estimating Cointegration Relationships, Nonstationary Time Series Analysis and Cointegration, ed. by C. Hargreaves, Oxford, Oxford University Press, (1994), 87-131.
- Howard, J. A./ Sheth, J. N.: The theory of buyer behaviour, New York (1969).
- Johansen, S.: Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models”, Econometrica, (1991), 59, pp. 1551-1580.
- Kahneman, D./ Tversky, A.: Prospect Theory: An Analysis of Decision under Risk, Econometrica, 47 (1979), pp. 263–292.
- Kocherlakota, N. R.: The equity premium: it’s still a puzzle, Journal of Economic Literature 34, (1996), pp. 42-71.
- Mackinnon, J. / Haug, A. / Michelis, L.: Numerical Distribution Functions of Likelihood Ratio Tests for Cointegration, Journal of Applied Econometrics, 14, (1999), pp. 563-577.
- Markowitz, H.: Portfolio Selection, The Journal of Finance, 7, (1952), pp. 77-91.
- Meffert, H.: Marketing. Grundlagen marktorientierter Unternehmensführung / Konzepte, Instrumente, Wiesbaden (2005).
- Mehra, R. / Prescott, E. C.: The Equity Premium: A Puzzle, Journal of Monetary Economics, 15, (1985), pp. 145-161.

- Mehra, R. / Prescott, E. C.: The Equity Premium Puzzle in Retrospect, Handbook of the Economics of Finance, ed. by G.M Constantinides, M. Harris and R. Stulz, North Holland, Amsterdam, (2003), pp. 887-936.
- Reddemann, S. / Basse, T. / Schulenburg, J.-M. von der: On the Impact of the Financial Crisis on the Dividend Policy of the European Insurance Industry, The Geneva Papers, 35, (2010), 53-62.
- Rietz, T.A.: The equity risk premium: a solution, Journal of Monetary Economy, 22, (1988), pp. 117-131.
- Romeike, F. / Erben, R. F. / Müller-Reichart, M.: Management Summary, Solvency II – Status Quo und Erwartungen, (2006), 1-8.
- Schubert, T. / Gießmann, G.: Solvency II = Basel II + X, Versicherungswirtschaft, 59, 18, (2004), 1399-1402.
- Skinner, B. F.: Beyond freedom and dignity, New York (1971).
- Teas, K. / Dellva, W. L.: Conjoint measurement of consumer's preferences for multiattribute financial services, Journal of Bank Research, (1985), 15, pp. 99-112.
- Tversky, A. / Kahneman, D.: Advances in prospect theory: cumulative representation of uncertainty, Journal of Risk and Uncertainty, (1992), 5, pp. 297-323.
- Watson, J. B.: Psychology from the standpoint of a behaviourist, Philadelphia (1919).
- Wedel, M. / Kamakura, W. A.: Market segmentation. Conceptual and methodological foundations, Boston (2003).
- Woodworth, R. S.: Psychology. A study of mental life, New York (1921).
- Zimbardo, P. G. / Gerrig, R. J. / Graf, R.: Psychologie, München (2007).

About the authors

Norman Rudschuck (norman.rudschuck@nordlb.de) is an economist working as financial analyst at Norddeutsche Landesbank (NORD/LB) in Hanover. He studied economics and business administration at the Leibniz University Hanover and was member of the local Junior Enterprise (Janus Consultants) as well as student assistant at the chair in insurance. He did internships at PricewaterhouseCoopers (Hanover) and St. Luke's Hospice (Cape Town, South Africa). His research interests focus on Solvency II and regulatory issues.

Tobias Basse (tobias.basse@nordlb.de) is an economist working as financial analyst at Norddeutsche Landesbank (NORD/LB) in Hanover. He studied economics and business administration at the universities of Hanover and Paderborn and holds a doctoral degree (economics) from university of Paderborn. He has published papers on financial economics, insurance economics and monetary economics in a number of reputable peer-reviewed journals (e.g., Economics Letters and Geneva Papers on Risk and Insurance). He also teaches finance and economics at Leibniz University Hanover and FHDW Hanover University of Applied Sciences.

Alexander Kapeller (alexander.kapeller@nordlb.de) is working as market researcher at Norddeutsche Landesbank (NORD/LB) in Hanover. He studied economics and business administration at the universities of Trier and Bucharest. His research interests focus on marketing, especially customer loyalty behavior and quantitative methodologies.

Torsten Windels (torsten.windels@nordlb.de) is chief economist at Norddeutsche Landesbank (NORD/LB) in Hanover. He studied economics and business administration at the university of Hanover. He has not only worked in the banking industry, but also in government agencies. His research interests focus on macroeconomics, monetary policy issues as well as regional economics.

Solvency II and the investment policy of life insurers: Some homework to do for the sales and marketing departments

Norman Rudschuck, Tobias Basse, Alexander Kapeller, Torsten Windels

The organisation of the paper is as follows: Firstly we will examine some basic principles of Solvency II. Secondly we will briefly discuss asset pricing models focussing on stock markets and show that equity prices are closely related to economic fundamentals and identifying stock crashes as rather seldom events than normal phenomena.

Solvency II is to be considered a paradigm shift for the European insurance industry and will lead to major changes in the process of asset and risk management. This new set of regulations is necessary. In fact, we believe that the current financial crisis has shown the importance of such advanced risk management processes in the financial services industry. The so-called subprime mortgage crisis obviously did have massive negative effects on capital markets and global economic growth. As a consequence, not only the stocks of banks and insurers dropped considerably; the equity market in general suffered huge losses.

Main principles

Almost at the end of the actual Solvency II implementing process, the subprime mortgage crisis shook the financial system. It became obvious, that rules were misused or at least extended to their limits into certain grey areas, and re-thinking of applicable regulations had to be done. The crisis has shown the importance of rethinking risk management highlighting the importance of Solvency II.

We will show by applying consumption based capital asset pricing model (CCAPM) that future return expectations of mainly equity investors (mutual funds) cannot be anticipated to be as low as historical records have shown within the last decade, biased by two major severe stock shocks. This results (*ceteris paribus*) in a lower return of investments in life insurances in comparison to equity investments.

Key implications

Solvency II will change the paradigms of risk and asset management in the European insurance industry. We believe that the new set of regulations will force life insurers to reduce their exposure to equities. This will definitely be a problem for asset managers in insurance companies; in combination with the low level of interest rates to be observed at the moment a permanent reduction to the equity quota will almost certainly result in rather unpleasant returns – especially in comparison to the performance of fund managers at mutual funds who face less constraints investing in equities. Given today's market environment asset managers in the life insurance most probably will not be able to solve this problem. We think that the life insurance industry will be forced to reposition the product endowment life insurance. This will mainly be the task of the sales and marketing departments. Quite clearly, the European life insurance industry will have to explain to customers that the characteristics of one of its most important products is about to change by deemphasising the factor attractive return and focusing more strongly on the factor low risk.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.