

The effects of a low interest rate environment on life insurers¹

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The current loose monetary policy pursued by many central banks around the world is resulting in extraordinarily low interest rates that are becoming a threat to the stability of the life insurance industry. This is especially the case in countries such as Germany, where products sold in the past with relatively high guaranteed returns still represent a significant share of the total portfolio.

Life insurers typically invest a large part of their portfolios in sovereign bonds. Therefore, the present low interest rates directly affect the rate of return of their portfolios. Moreover, typical life insurance products offered in Europe are sold with a long-term minimum return guarantee, which is set at the inception of the contract and remains unchanged until the contract ends. Life and annuity contracts usually have maturities of 20 to 30 years, meaning that life insurers still hold contracts in their underwriting portfolios that were sold in times when investment guarantees were significantly higher owing to higher bond yields. In addition, the duration of a life insurer's liabilities is typically higher than the duration of its assets. Therefore, under a market consistent valuation of assets and liabilities, i.e. under the forthcoming Solvency II regulation, the current low interest rates increase current liability values more than asset values. This, in turn, reduces the market value of equity capital, thus having a detrimental effect on insurance companies' solvency situation.

¹ The complete document is available at: The Geneva Papers on Risk and Insurance (retrieved on June 12, 2015).

<http://www.palgrave-journals.com/gpp/journal/vaop/ncurrent/full/gpp201438a.html>.

The case of the German life insurance industry

In our paper, we aim to assess the solvency situation of a typical German life insurer under the incoming Solvency II regulation, i. e. a mark-to-market regulatory regime. Our work also allows us to assess the impact of the newly introduced reform of German life insurance regulation (i.e. the “Lebensversicherungsreformgesetz”) on insurers’ default probabilities. To do so, we generate a stochastic term structure of interest rates and stock market returns to simulate the investment returns of a stylized life insurance business portfolio in a multi-period setting. Based on empirically calibrated parameters, we can observe the evolution of life insurers’ balance sheets over time, in particular their solvency situation. To account for different scenarios and to check the robustness of our findings, we calibrate different capital market settings and different initial situations of capital endowment. Our results suggest that a prolonged period of low interest rates would markedly affect the solvency situation of life insurers, leading to relatively high cumulative probabilities of default for less capitalized companies.

Simulation of different capital market developments

We project the insurers’ balance sheets 10 years into the future under different (stochastic) capital market settings and with different initial capital endowments. For this, we consider three calibrations for the simulation of capital market developments: under calibration 1, interest rates with a maturity of 10 years gradually converge towards 2%; under calibration 2, towards 1%; and finally, under calibration 3, towards 3%. We assume five different initial capital endowments, each representing a quintile of the observed capital endowments among German life insurers at the end of 2012. Both the asset and the liability side are modeled by taking into account the time to maturity structure that is typical for the life insurance business: based on publicly available German data, we are able to reproduce a duration mismatch between assets and liabilities of 3.75 years, which is very close to what is being observed in the German life insurance industry. Moreover, we distinguish between the book value balance sheet subject to German GAAP and the market value balance sheet subject to Solvency II rules. The former is used as a basis for the profit participation mechanism typical for life insurance contracts, whereas the latter is used to determine the solvency position of the life insurer.

Implications for the solvency situation of German life insurers

The results of our study suggest that: (i) should interest rates remain at the current level and gradually converge towards 1%, the solvency ratio of a large number of German life insurers would be considerably reduced, with a consequent increase in

the probability of default starting as early as 2016; and (ii) a moderate rise in the interest rate level would considerably increase the solvency margin, and thereby reduce the probability of default.

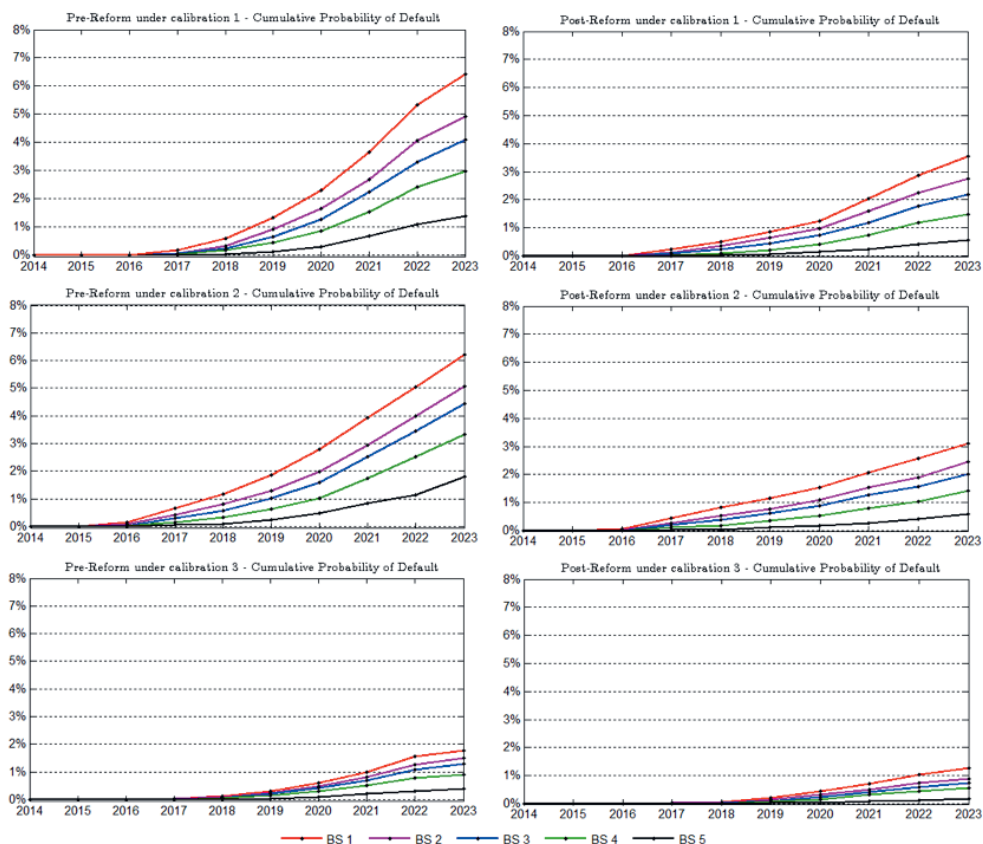
The newly introduced reform of German life insurance regulation substantially improves the situation, especially for less capitalized companies, which would otherwise not be able to bear the losses stemming from their liabilities. Yet, this improvement comes at the expense of lower benefit payments to policyholders, who experience a reduction of the minimum profit participation and therefore a haircut on their claims.

In conclusion, our model is of special interest for three reasons: (i) it allows a realistic calibration of different market conditions and different regulatory features; (ii) it provides insights into the effects of monetary policies on financial institutions which give long-term financial promises, such as life insurers and pension funds; and (iii) it can serve as a tool in the newly introduced Forward Looking Assessment of Own Risks (FLAOR), which insurance companies will have to perform under the Solvency II regulation.

References

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Chart 1: Cumulative probability of default before and after the 2014 reform of German life insurance regulation



Source: Authors' calculations.

Note: Balance Sheet 1 (BS1) represents the bottom quintile (less capitalized companies), whereas Balance Sheet 5 (BS 5) represents the top quintile (most capitalized companies).