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Is Premium Adjustment a Cure-All for Private Health Sector? The Case of Germany

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ABSTRACT: Health insurance companies are confronted with various tasks in order to offer life-long health care services to their customers. Increasing health expenditures and growing life expectancy necessitates doing annual calculations. At this point triggering factor is applied as a control instrument for continuously seen alteration of health expenses. On the basis of triggering factor a decision must be taken whether premium adjustment is required or not. Premiums of old people may increase seriously, but newly determined premium after premium adjustment must be limited. That means, up to a maximum of a certain premium increase can be given to an insurance holder. In this connection; old age problem in German health insurance sector, application of single premiums, their financing resources, and investment strategies of insurance companies are illustrated as a model. This paper shows that premium adjustment alone is not enough to stabilize premiums. So, the need of qualified finance department for asset management occurs.

Keywords: Health insurance companies; old age problem; premium adjustment; investment portfolio
JEL Classifications: G11; G22; I13; J11

1. Introduction

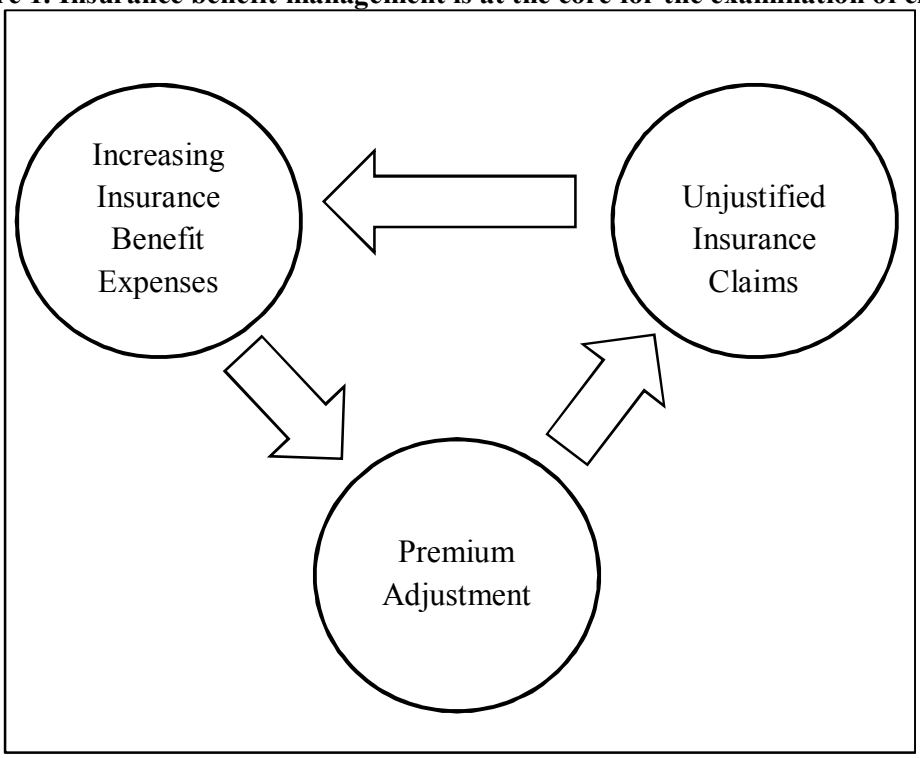
Private health insurance sector involves a great risk of change concerning health care costs which are the reasons for being unable to price insurance coverage for an unlimited period of time or lifelong. From the point of actuarial view, premium adjustments are new calculations of already existing insurance contract in the framework of change in insurance product. In combination with the prohibition of an ordinary termination by health insurance company according to Insurance Supervision Act (Versicherungsaufsichtsgesetz -VAG, Paragraph §12 1. Clause), the necessity for premium adjustment results when modified calculation bases occur (Milbrodt, 2005).

The triggering factor is used to compare the required with the calculated insurance benefits based on paragraph §12b (2) of Insurance Supervision Act (Versicherungsaufsichtsgesetz - VAG) and paragraph §14 (1), (2), (3) of Calculation Ordinance (Kalkulationsverordnung – KalV). Thus, triggering factor supports reviewing the need of premium adjustment.

Figure 1 emphasizes the importance of insurance benefit management where the examination of claims plays a crucial role. As a result of unjustified insurance claims increasing expenditures are inevitable. So, premium adjustment will result. Consequently, for an efficient and accurate audit following guidelines need to be applied consisting of existing insurance contracts, legal regulations, current legal practice, and current status of medical science (Molt, 2010).

The insured should receive all contractual guaranteed insurance benefits. In the German health sector double aging condition, caused by increasing life expectancy and birth deficit, exists. Until 2060, the life expectancy of 65 years old people will grow by 5.1 – 5.2 years. Furthermore, life expectancy of men reached to 84.0 and of women to 87.3 years in private health insurance sector in 2011. On the other hand, life expectancy concerning whole country in 2009 is 77.3 years for men and 82.5 years for women. It is obvious that people insured in the private health sector live more than 5 years longer than statutory insured people (Aigster, 2011a).

Figure 1. Insurance benefit management is at the core for the examination of claims



Source**:** Molt (2010: 49)

For a constant population growth the necessary number of birth per woman is 2.1. Indeed, the birth rate decreases from 1.45 in 1990 to 1.38 in 2008 (Molt, 2010). To deal with aging problem in Germany aging reserves are built in order to meet increasing health care expenses. Aim of premium adjustment is not only to finance higher current insurance benefits, but also it must lead to an increase in aging reserve of the insured people. So, a level of aging reserve is reached which can easily meet increased future insurance benefits (HUK-COBURG, 2011).

In the first part of the study, prerequisites for premium adjustment are examined. The following part introduces the concept and scientific methods of newly determined contribution after the process of premium adjustment. In the final part of the paper, measures are discussed in order to limit premium increase in old age and even cut contribution of elderly people.

2. Required Prerequisites for Premium Adjustment: Triggering Factor TF^{new}

Main reasons of premium increase are growth of health expenses particularly caused by inflation, medical progress (e.g. purchasing new expensive devices), dynamic increase of life expectancy (that means more and more health care treatment in old age), steeper slope of the profile, and decrease in dynamic change of tariff cancellation. After cancellation accumulated old age reserve would remain in the insurance company (Fürhaupter, 2002). Health insurance companies every year use primarily triggering factor during premium adjustment procedure to control the necessity of premium adjustment (Bohn, 1980). According to 2th Clause of paragraph §12b of Insurance Supervision Law (VAG) (Versicherungsgesetze, 2004) and as determined in 1th, 2th, and 3th Clauses of paragraph §12(1) of Calculation Regulation (KalV), comparison of required (i.e. actually occurring) health care expenses with previously expected (i.e. calculated) expenses is necessary (Bundesministerium für Justiz, 2013a).

Premium adjustment paragraph is to be applied when triggering factor $TF^{new} > 1.1$ or $TF^{new} < 0.9$. Thus, premiums supervision of questioned insurance coverage is required. These reviews for each insurance product in question is done by examination of insurance product premiums for each unit consisting of men, women, children, and in some cases even for youth separated in men and women (Bohn, 1980). Input data necessary for this comparison of insurance product for each observation unit are as following (Helfmeier, 2003):

$\boldsymbol{k_x}$: Current calculated profile value of x years old individual

$\boldsymbol{L_x^B}$: Average number of x year old individuals in observation year B (Available people in insurance products are defined as 'portfolio')

$\boldsymbol{B}$: Consisting of values t-2,t-1, t

For the extrapolation period t+2 extrapolated portfolio is not determined, but the value of last observation value is used:

$$\boldsymbol{L_x^{t+2} = L_x^t}$$

Average portfolio should be as accurate as possible, i.e. in order to determine exact values it is better to proceed on daily basis than on monthly basis. Average calculated from the initial and final portfolio would be imprecise.

$\boldsymbol{S^B}$: Actual insurance benefits for all ages in observation year B minus net risk surcharge

$\boldsymbol{G^{actual}}$: actual, i.e. required basic burning costs (basic health care costs per person)

After definition of important indicators actual health care expenses and calculated, i.e. before expected health care expentidures can be determined.

Required, i.e. extrapolated actual insurance benefits in period t+2 is obtained after determining basic burning costs $\boldsymbol{G^B}$ for observation years t – 2, t – 1, and t from the following equation (Helfmeier, 2003, Lenckner, 2013a and Bohn, 1980):

$$\boldsymbol{G^B \cdot \sum_x L_x^B \cdot k_x = S^B} \text{ i.e. } \Rightarrow \boldsymbol{G^B = \frac{S^B}{\sum_x L_x^B \cdot k_x}}$$

$\boldsymbol{G^B}$ values are compensated after linear Gaussian (Least Squares Method) by equal weighting of all 3 observation years $\boldsymbol{G^{t-2}}$, $\boldsymbol{G^{t-1}}$ and $\boldsymbol{G^t}$ which are the extrapolated basic burning costs. $\boldsymbol{G^{t+2}}$ is the value of the straight line at the point t+2. Thus, following equation is obtained (Lenckner, 2013a and Helfmeier, 2003):

$\boldsymbol{G^{required} = G^{t+2} = \frac{3}{2}\left(G^t - G^{t-2}\right) + \frac{1}{3}\left(G^{t-2} + G^{t-1} + G^t\right)}$ and, so required health care expenses are determined as follows:

$$\boldsymbol{S^{required} = G^{required} \cdot \sum_x L_x^t \cdot k_x}$$

Calculated health care expenditures are found by means of current calculated basic burning costs $\boldsymbol{G^{calculated}}$ as follows:

$$\boldsymbol{S^{calculated} = G^{calculated} \cdot \sum_x L_x^t \cdot k_x}$$

As a result, if the ratio is between 0,9 and 1,1$\left(\boldsymbol{0.9 \leq \frac{S^{required}}{S^{calculated}} \leq 1.1}\right)$, the necessity of premiums control in observation units of questioned insurance products and premium adjustment are not necessary. If the triggering value is outside the above given limits and if this deviation is recognized as temporary, premium adjustment is not required. If the deviation is seen as permanent, premium adjustment is necessary. In this case, all calculation bases used in the calculations for observation units needs to be checked and if necessary they should be updated. If extremely large damage or epidemic affect insurance benefits occuring in observation period B and the above mentioned ratio is a bit under 0.9 but the damage is seen for a short time and in close time the ratio is expected to be close to 1, then the deviation is concerned as temporary. So, in this case there is no need for premium adjustment. In addition, if major changes occur in mortality (probability of dying) same procedure is implemented (Lenckner, 2013a; Helfmeier, 2003).

Higher expected insurance benefits for an age group in future result by declining mortality or increasing burning costs (i.e. health care costs per person). Consequently, premium post-calculation of concerned insurance products lead to higher premiums for the insured people (Schmidt, 2010).

This ratio $\boldsymbol{\frac{S^{required}}{S^{calculated}}}$ is defined as triggering factor. If the ratio of required and calculated health care expenses is bigger than 0.1 and if this change is seen permanent, then premium adjustment is unavoidable $\left(\boldsymbol{\left|\frac{S^{required}}{S^{calculated}} - 1\right| > 0.1}\right)$, (Helfmeier, 2003 and Lenckner, 2013a).

Using profiles in calculation of premiums are useful, because only one variable is to be estimated which the basic is burning cost. So, such a profile is often applicable for many insurance products and it is stable in course of time, that is to say inflation does not change profile of premiums given in contracts. In addition, burning cost ratios are used to assess the calculation. Thus, application of profile ensures adequacy of calculation (Schneider, 2003).

3. Newly Determined Premium After Premium Adjustment

In order to find accurate premium for an individual insurance company payments must be allocated to corresponding period of time for services received in particular year. The limitation with observed time period has the following meaning: Only payments for health care expenditures in the observed year are taken into account. For example, if the doctor bill is submitted to insurance company at the end of the year or at the beginning of next year to settle the bill, then the actual payment is performed a year later for health services received in the last year. However, when calculating the burning costs per person delayed payments for health services should be added to health expenditures of the concerned period of time (observation year) in which they have occured. Therefore, health care expenses HCE(T) of the observed time period T (12 months) are determined as follows (Gessner, 1998):

Health care expenditures *HCE*(*T*) limited to T year

= Payments in the year T for health care services received in T

\+ Payments in the year T+1 for health care services received in T

\- Additional charge for higher risks

With this formula, expected health care expenditures per person for an average individual, i.e. a person not carrying high risk, can be calculated. Main issue in calculating insurance benefits per head is that it can alter with time. So, increasing expenses in health care sector is the most important reason. That's why, if such a situation is given every year burning costs per head need to be recalculated. According to 2nd Clause of paragraph §12b of Insurance Supervision Act (VAG), burning costs per person should be examined every year and it needs to be updated if changes are recognized (Milbrodt, 2005).

If an actuary (insurance mathematician) does the calculation of premium only on the basis of meeting the average health care expenses of an insured person due to the aging of the population, the average health care costs would automatically grow. This situation causes increase in premiums directly each year. As is well known, a 50 years old person visits doctor more often than a 20 years old and 50 years old individual requires more medication. Hence, insurance companies must calculate premiums such that, on the one hand, premium calculation should include increase in health care expenses and, on the other hand, premiums should remain constant even time passes. Because of these reasons, premiums received from young insured people by insurance companies must be determined such that they should be bigger than the expected expenses in current year. That means, insurance companies charge young people usually more than their expected health care expenses. This additional required premium is kept in a separate account and it is used to reduce rising premiums in future years. This account is also called aging reserve. Accumulated money in this account is usually invested for the guaranted interest rate of 3.5% or even for bigger interest rate. Aim of this separate account is avoiding excessive premium increase in future years (Kleinlein, 2012).

In the statement of the insurance company Signal Iduna it is declared that 50% of the premiums requested from young people are foreseen for old age, which means it is transferred to aging reserves (Sozialverband Nordrhein-Westfalen, 2008). The aim here is to keep the premium constant during the time period of being insured.

Premium adjustment is basically seen as a change from an insurance product with calculation basis before premium adjustment (upper index "o") to the same product with new calculation basis after premium adjustment (upper index "n"). Erich Scheider says: "Each such premium adjustment of a tariff has to be approved by an independent trustee. So the revision of the bases of calculations of a given tariff is under control of two persons, the appointed actuary and the trustee" (Schneider, 2002). But, the appointed actuary has to consider several regulations set by law. He is also responsible for the correctness of the premium calculation. At the same time, he has to secure continuous fulfilment of liabilities and the solvency margin should be met. Appointed independent actuarial trustee has to

approve adjustment of premiums which is needed to protect the interests of insurance holders. Also, he must agree the use of provision for premium refund (Fürhaupter, 2002).

All insured people of an insurance company have the right to switch to other already existing tariff and as well to the new tariff of the same company (Schneider, 2002). In general, switching costs are not included in the calculation by doing premium adjustment. After 2nd Clause of paragraph §11 in the Calculation Regulation (KalV), it is forbidden to consider switching costs for an insured who has completed his/her 45 years (Helfmeier, 2003).

Monthly new premium P^n is calculated as follows :

$$p^n = p^n_{x+m} - \frac{(1-\Delta^o)\cdot a^o_{x+m}}{(1-\Delta^n)\cdot a^n_{x+m}} \cdot (p^o_{x+m} - p^o) - \frac{\alpha^n \cdot p^n_{x+m} - \alpha^o \cdot p^o_{x+m}}{(1-\Delta^n)\cdot a^n_{x+m}}$$

where,

$a_x = \frac{N_x}{D_x}$ Annuity value of x-years-old

N_x: Sum of discounted alive individuals

D_x: Discounted alive individuals

Δ: Sum of cost surcharges to cover company activities

4. Measures to Limit Premium Increase in Old Age

4.1 Old age problem in German health insurance sector

In Germany, a variety of measures have been initiated to solve actuarial old age problems. At the end of 1960's, first insurance companies began to use funds from reserves for premium refunds at premium adjustment in order to restrict in particular the amount of premium adjustment. Due to extremely high premium increases of old private insured people in the 90s, a wave of criticism had started about the calculation method in Germany. As a consequence, former German Federal Parliament (Bundestag) deployed an independent commission of experts to examine the problems of increasing premiums of privately insured old people in 1994. This commission headed by Prof. Dr. Jürgen Wasem undertook a systematic analysis of the problem and submitted a series of solution proposals after two years. Thus, tools for attenuation of premium growth were expanded as a result of these efforts. Some of these proposals have been implemented with the introduction of the Health Reform Act in 2000 of statutory health insurance. One of the measures was to consolidate aging reserve, that's why 90% of investment gains exceeding the forecasted profit (calculated in the calculation basis) are annually credited to policyholders. That is to say, for example calculated interest rate of 3.5% in German private health insurance sector and received net interest rate of 5.0%, i.e. 90% of this interest surplus of 1.5% is to book policyholder's aging reserve account. These funds are accrued with interest and they are used for insured above 65 years in case of premium adjustment as reducing effect of premiums. This method is also called limitation of premium adjustment with surplus funds (Überschussmittel) (Lenckner, 2013b and Fürhaupter, 2002).

Another important method initiated by Wasem Commission was charging new insurance contracts with statutory extra premium as the amount of 10% of requested premium which needs to be paid until the age of 60 years. This statutory extra premium is applied to reduce premium for insured people above 65 years old. The aim of this method is to cushion disproportionate increase in health care sector, but this is valid for insurance contracts as from the year 2000. Regardless of premium adjustment; premiums in private health sector strongly depend on starting age of insurance contract, that is to say, also without premium adjustment the average premium of 50 years old person is higher than 30 years old person. Furthermore, elderly insured people (older than 60 years) have not paid this surcharge; so they are not going to profit from it, where actually the issue is about premium development of these people (Deutsche Aktuarvereinigung, 2010 and and Fürhaupter, 2002).

Statutory extra premium (gesetzlicher Beitragszuschlag) is used to stabilize the premium of the insured people between 65 and 79 years. This means that premium increase of these people is compensated. Furthermore, this extra charge is applied for premium decrease for insured people from the age of 80. Both techniques are also done with funds from interest surplus according to §12a of Insurance Supervision Act (VAG) (Lenckner, 2013b).

Furthermore, surpluses and free funds in company are used to limit frequency and amount of premium increase. In addition to limitation of premium increase surpluses are used to finance of

premium refunds (Beitragsrückerstattungen). The insured can get back part of the premium paid if the insured has not claimed insurance benefits within the fiscal year. The amount of the premium refund (PR) may be contractually agreed (non-performance PR), but it also depends on surplus and thus from the economic success of the company (profit-related PR) (Schmidt, 2010 and Fürhaupter, 2002).

Moreover, results paper of a study published by German Association of Actuaries shows that premiums of privately insured grew by an average 3.6% in the period of 2000 and 2010. Average premium of people over 50 years old increased by 3.0% in the same period. For insured people over 60 years old premium arose by only 2.4% on average. In addition, 1.2% increase of premiums was recognized in the same period for insured over 80 years old. Thus, it is obvious that additional burden of elderly insured is less than young insured people, although increase of health care expenses behave contrarily for old people. So; measures to restrict premiums show effect (Deutsche Aktuarvereinigung, 2010).

4.2 Single premiums method to limit contribution

In the German private health sector calculation of individual premium by premium adjustment means that additional requested contribution may vary widely. In order to control strong dispersion in additional charges insurance companies initiated a method in which new additional monthly premium should not exceed 'd' Euros or it should not be higher than p% above the existing premium. Mathematical formulation of premium limitation is as follows (Helfmeier, 2003):

$$\tilde{p}^n = \min[\, p^n \;;\; (p^{old} + d) \;;\; (p^{old} + \frac{p}{100} \cdot p^{old}) \,]$$

p^{old}: existing or old premium
p^n: new premium
$\tilde{p}^n$: limited new premium

So, the difference of newly calculated and limited premiums ($p^n - \tilde{p}^n$) is generally used to finance in case of permanent limitation for whole remaining term of insurance. As a result; following net single premium (NSP) is required (Helfmeier, 2003):

$$NSP = (p^n - \tilde{p}^n) \cdot 12 \cdot (1 - \Delta^n) \cdot a^n_{x+m}$$

Now the question about financing resources of above introduced single premiums is to be discussed. For this purpose four resources are considered (Helfmeier, 2003 and Lenckner, 2013b).

Single premiums from 'reserves for premium refunds' illustrated in Figure 2 can be explained as follows (Bundesministerium für Justiz, 2013):

According to §12a Clause 3 of Insurance Supervision Act (VAG) transferred funds to non-profit-related premium refund are separated by insurance product. Hereby, Figure 2 shows three major sources of non-profit-related premium. Application of these funds take place after completing the age of 65. So, there is a transfer of funds from 'reserves for premium refunds' to aging reserve.

Funds available in profit-related premium refund originate from shares of company income surpluses are also used for insured people in old age as can be seen from Figure 2. So, here also a transfer of capital from profit-related premium refund to aging reserve takes place. In both cases single premiums are financed in order to limit premiums by premium adjustment.

Furthermore, single premiums are funded by 'statutory extra premium' based on §12a Clause 2 of VAG. In §12 Clause 4a (Bundesministerium für Justiz, 2013) it is directly mentioned that credited funds originate from the statutory extra premium. As explained above, statutory extra premium is used as a component of aging reserve which is now added to another component. This reserve is also used for insured people after completing the age of 65.

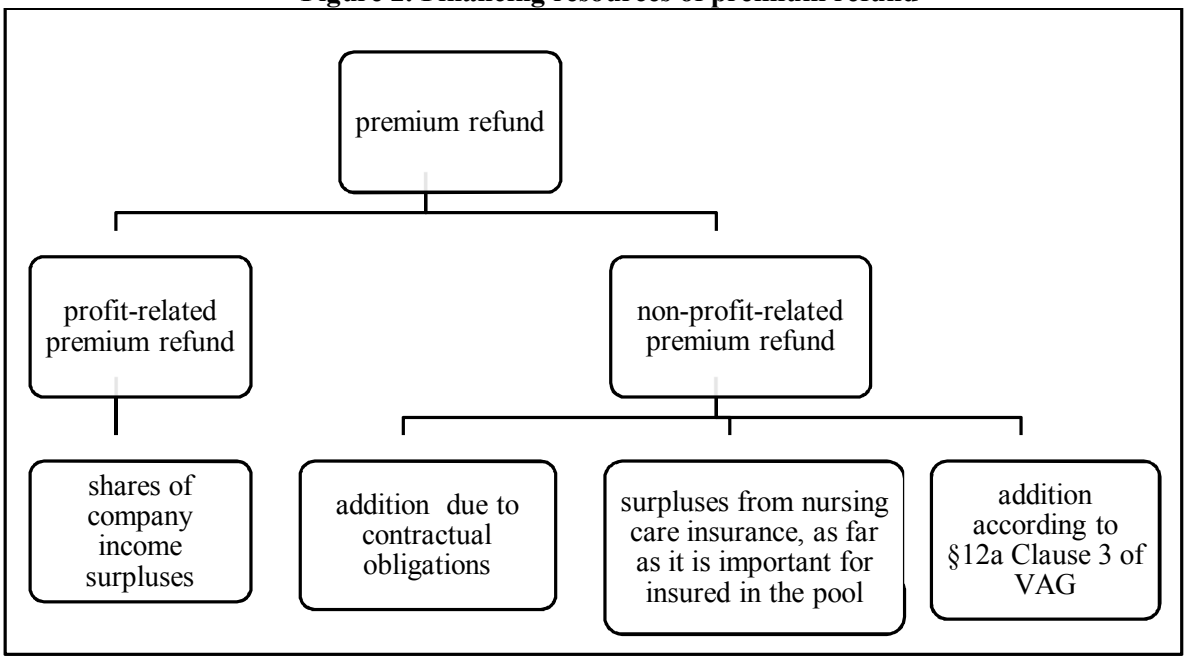
The fourth source of single premiums comes from resources based on§12a Clause 2 of VAG which is not derived from statutory extra premium directly credited funds. The usage of this capital is prescribed by law after completing the age of 65. This part makes up one component of aging reserve now transferred to another type of reserve from which single premium is covered.

4.3 Investment Strategies of Insurance Companies

In general, insurance companies must have highly effective underwriting, leading automation rate in contracting and claims management, hard cost management, and streamlined processes throughout the insurance company. But, alone these key performance indicators are not sufficient for insurance company to secure continuous fulfilment of liabilities that an insurance company faces (Allianz Insurance Germany, 2013). Investment incomes play major role for insurance companies as

an instrument to stabilize and even to decrease the premium of elderly insured people. Allianz Health insurance company highlights this situation with: "Strong financial position translates directly into superior premium stability" (Allianz Insurance Germany, 2013).

Figure 2. Financing resources of premium refund



Source: Verband der Privaten Krankenversicherung (2012: 41)

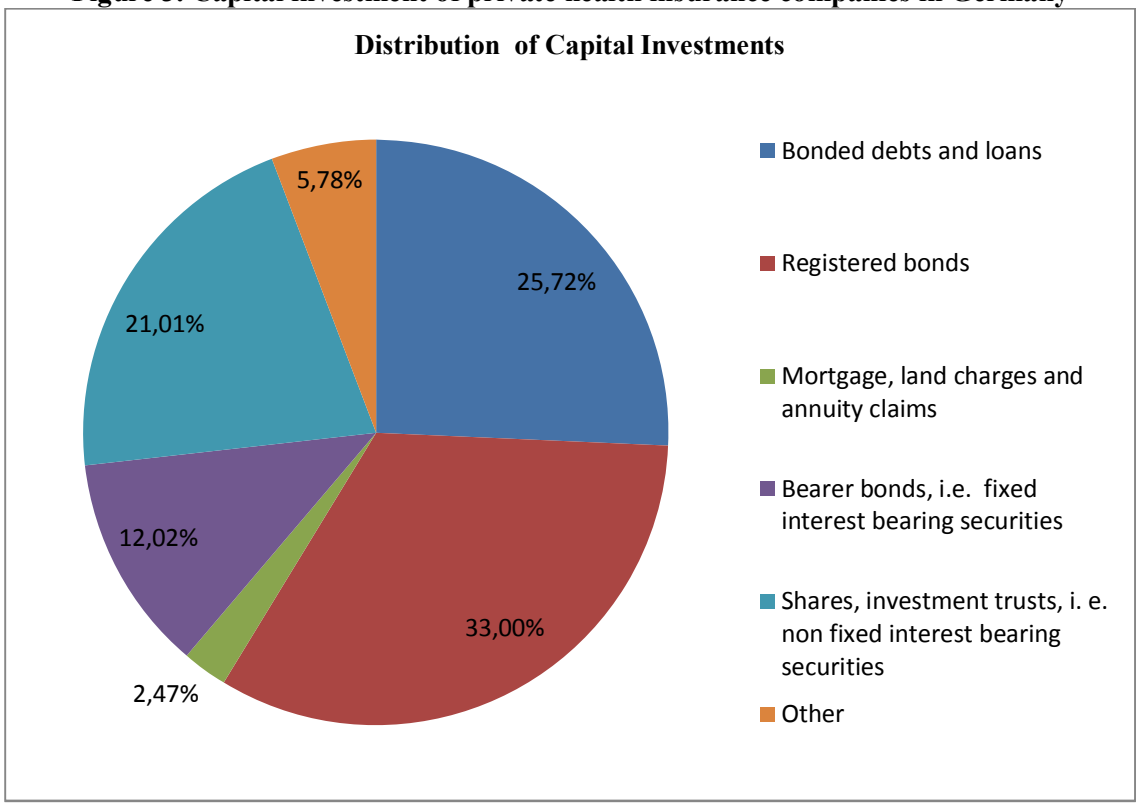
Largest investors in Europe's financial markets are European insurance companies with 6.7 trillion Euros of assets including more than 3 trillion Euros in corporate and government bonds. Long-dated bonds are most preferred investment tools by insurer for being a good match in terms of long-term liabilities. The new capital requirements for insurance companies are determined in Solvency II which came into force in January 2013 in Germany. Insurers are main institutional investors in bank bonds. Implementing Solvency II would change the investment behavior of insurance companies to allocate their capital and it would also give preferential treatment to bonds with good credit ratings and short maturities. According to Solvency II insurers in future have to put more capital aside in order to meet the risks arising from insurers' investments. Insurance companies must avoid excessive risk so that investment portfolio of insurers' consists of fixed-income securities and investment funds. Thus, real estate, equities, and alternative investments are less preferred. Solvency II is the regulatory framework for governing insurance companies in which the capital adequacy rules are determined. Solvency II consists of three pillars. Pilar I covers the minimum capital adequacy requirements. Pillar II regulates the supervisory review process, internal controls, and risk management. Pillar III intends to enhance market discipline in which extensive disclosure requirements, the support of transparency, and intensified integration with International Financial Reporting Standards (IFRS) are included (Deutsche Bank Research, 2011 and Bundesanstalt für Finanzdienstleistungsaufsicht, 2014).

Hereby, investment strategies of insurance companies requires considering. Figure 3 clarifies the distribution of capital investments of German health insurance companies in 2012. The success of private health insurance investment strategies can be measured by accumulation of aging reserves which reached 181.6 billion Euros by the end of 2012. According to Association of Health Insurance Companies aging reserves have more than doubled in the last ten years. Such a result makes it clear how profitable chosen investment strategies were in the last decade. In this time period, health insurance industry has reached a net interest of 4.2% which easily meets mandatory highest interest rate of 3.5% in German health insurance industry (Verband der Privaten Krankenversicherung, 2012).

But on the other hand, within the framework of capital investments insurance companies have claims against banking sector. That's why, these companies are affected by depreciation requirements and liquidity problems of some banks. It is obvious that low interest rates and weak stock market may

have negative consequences on the realized investments by insurance companies and most of these firms may review their investment policy (Euroforum Deutschland Se, 2009).

Figure 3. Capital investment of private health insurance companies in Germany



Source: Verband der Privaten Krankenversicherung (2012: 45)

Insurance companies pursue the objective of reaching highest possible return by maximum security in capital investment management. Asset management department of insurance companies must always provide capital on time in order to meet existing obligations against insured and others. Current income from investments reached 7.5 billion Euros in 2010 by investing total capital of 176.4 billion Euros in the same year. From the same report, it is obvious that life insurance companies managed even much more capital consisting of 734.4 billion Euros and reached an income of 31.7 billion Euros. German insurance sector has invested a total of 1,256.4 billion Euros in 2010. Moreover, investment volume compared to 1990 has quadrupled (Gesamtverband der Deutschen Versicherungswirtschaft, 2012). In order to understand how successful German insurance industry operated it can be compared with Turkish economy by relating it to Gross Domestic Product (GDP) of Turkey in 2010. GDP of Turkey was 1,105 Billion Turkish Liras (Türkiye İstatistik Kurumu, 2011) which corresponds to 537.69 billion Euros (Türkiye Cumhuriyet Merkez Bankası, 2010). This comparison makes it clear that even insurance industry in Germany manages twice more money than even the monetary value of all the finished goods and services produced within Turkey's whole economy in the same year.

Table 1 presents more detailed information on investment behavior of insurance companies. The financial crisis in Europe in 2008 and following Euro crisis, all these factors combined have led insurance companies to decrease purchasing shares from 8.2% in 2007 to 3.3% in 2010. This decision of insurance companies can be explained by the situation in which shares are uncertain investment instruments. Bonds are interest-bearing securities which are normally used for long-term capital investment. 78.8% of all available capital was invested in bonds in 2010. But, the situation on bonds market was characterized by high volatility. For example, yields of a 10-year federal government bonds had fallen considerably since 2007 and reached an average yield of 1.6% in 2012. Such a development on capital market is a major challenge for all market participants. The low level of interest rates complicates new- and re-investment of capital investments of insurer. In spring 2012, due

to expansionary monetary policy of European Central Bank (ECB) the situation noticeably facilitated on capital markets with a significant positive trend on the stock markets. The ECB made it possible for European banks to borrow 1,000 billion Euros in December 2011 and February 2012 by a lending rate of 1.0%, i.e. base rate in December 2011 for a three years' time period **(**Gesamtverband der Deutschen Versicherungswirtschaft, 2012). Base rate decreased more and more. It reached 0.75% in 2012 and even 0.25% in November 2013 (Finanzen.net, 2014).

Table 1. Investment portfolio of German insurance sector differentiated according to investment types

Investment Types	2007	Share in total	2010	Share in total
Bonds (Renten)	865.7	73.0	989.4	78.8
Shares (Aktien)	97.7	8.2	41.8	3.3
Shareholdings (Beteiligungen)	136.0	11.5	135.9	10.8
Real Estates (Immobilien)	34.8	2.9	36.7	2.9
Other Assets (Sontige)	51.7	4.4	52.5	4.2
Total	1,185.8	100.0	1,256.4	100.0

Source: Gesamtverband der Deutschen Versicherungswirtschaft (2012: 15)

5. Conclusions

Premium adjustment may support the insurance company to ensure the Equivalence Principle between received premiums and demanded insurance benefits. Due to the strong growing health expenditures in old age, premium adjustment may lead to non-affordable premiums by customers. Consequently, insured people may cancel their existing insurance product. Because of all these reasons, premium calculation for young people needs to be done carefully. For example, leading German insurance company Signal Iduna states that it sets aside 50% of premiums received from young insured people for old age. Such methods response significantly to available problems in health care sector. But, comprehensive service catalog in private health sector and durable changing parameters, i.e. mainly increasing life expectancy of insured people make it difficult to fix premiums. Techniques like premium limitation by single premiums are applied as premium adjustment to stabilize new calculated premiums for insured after completing the age of 65 or even to cut premiums.

It is obvious that only application of premium adjustment as a preventive method helps insurance companies to respond changing circumstances like increasing health care expenditures. But, in fact only carefully determined premiums consisting of reserve part for young insured people and correctly chosen investment instruments of these funds, for example bonds, shares, shareholdings, real estates, and other assets, support rising profit and so aging reserve. The more aging reserve is available; the better is to finance single premiums. In Germany, insurance companies managed 1,256.4 billion Euros even twice bigger than Turkey's gross domestic product in 2010. Share of health insurance companies in investment portfolio of 14% should not be underestimated in whole sector which had an investment income of 7.5 billion Euros in 2010. At last, insurance companies face many complicated tasks to offer best possible health care services to their customers. These increasingly complex challenges reach from handling submitted invoices of health care services, making an adequate premium calculation, and particularly maximizing investment profit. Here, the need of qualified finance department for asset management is required or these tasks should be outsourced by leading asset management companies. Interest surplus enabled in terms of financing companies have sufficient financial extent to fund both operating business and further strategic investments.

References

Aigster, U.J. (2011a). Mathematik der Privaten Krankenversicherung SoSe 2011, http://www.mathematik.uni-muenchen.de/~aigster/Folien_Teil_II_2011_S54.pdf, (03.01.2014).

Aigster, U.J. (2011b). Mathematik der Privaten Krankenversicherung SoSe 2011, http://www.mathematik.uni-muenchen.de/~aigster/Folien_Teil_I_2011.pdf, (04.01.2014).

Allianz Insurance Germany. (2013). Allianz Capital Markets Day, https://www.allianz.com/v_1372138505000/media/investor_relations/en/conferences/capital_markets_days/documents/2013_allianz_cmd.pdf, (04.01.2014).

Bundesanstalt für Finanzdienstleistungsaufsicht. (2014). Solvency II: Aufbau und Gesetzgebung, http://www.bafin.de/DE/Internationales/Regelungsvorhaben/Solvency2/solvency2_node.html, (03.02.2014).

Bundesministerium für Justiz. (2013). Gesetz über die Beaufsichtigung der Versicherungsunternehmen (Versicherungsaufsichtsgesetz –VAG), www.gesetze-im-internet.de/bundesrecht/vag/gesamt.pdf, (09.01.2014).

Deutsche Aktuarvereinigung. (2010). Ergebnispapier der Deutschen Aktuarvereinigung – Reaktion der DAV auf den Schlussbericht des IGES-Instituts, https://aktuar.de/custom/download/2010-12-13_DAV_Ergebnispapier_IGES_Studie.pdf, (14.01.2014).

Deutsche Bank Research. (2011). Solvency II and Basel II – Reciprocal effects should not be ignored, http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000278734.pdf, (15.01.2014).

Euroforum Deutschland Se. (2009). http://www.presseportal.de/pm/6625/1418813/ versicherer-schuetzen-ihre-kapitalanlagen-9-handelsblatt-jahrestagung-kapitalanlagestrategien-fuer, (17.01.2014).

Bohn, K. (1980). Die Mathematik der deutschen Privaten Krankenversicherung, Schriftenreihe Angewandte Versicherungsmathematik, Heft 11, Verlag Versicherungswirtschaft, Karlsruhe.

Finanzen.net. (2014). Aktueller Leitzins, http://www.finanzen.net/leitzins/, (05.02.2014).

Fürhaupter, R. (2002). Adjustment in a fully-funded system, 27th International Congress of Actuaries, Cancun/Mexico, http://www.actuaries.org/EVENTS/Congresses/Cancun/health_subject/health_40_furhaupter_b.pdf, (16.01.2014).

Gesamtverband der Deutschen Versicherungswirtschaft. (2012). Jahrbuch 2012, http://jahrbuch.gdv.de/GDV-Jahrbuch2012.pdf, (22.01.2014).

Helfmeier, H-J. (2003). Seminar Grundwissen Krankenversicherungsmathematik, Lecture notes. Deutsche Aktuar Akademie, Bonn, Germany.

HUK-COBURG. (2011). Die Lösung des Altenproblems der PKV, http://www.hzv-uhh.de/fileadmin/gemeinsam/Veranstaltungen/Vortraege/AltenProblem_Uni_HH_07072011.pdf, (02.02.2014).

Kleinlein, A. (2012). Die Entmystifizierung der Alterungsrückstellung, in: Handelsblatt,http://www.handelsblatt.com/meinung/kolumnen/kurz-und-schmerzhaft/kleinleins-klartext-die-entmystifizierung-der-alterungsrueckstellung/7564532.html, (03.02.2014).

Lenckner, A. (2013a). Mathematik der privaten Krankenversicherung Skript, Vorlesung Somersemester 2013, http://www.mathematik.uni-muenchen.de/~lenckner/2013--Skript-2013-07-15.pdf, (26.01.2014).

Lenckner, A. (2013b). Mathematik der privaten Krankenversicherung Folien, Vorlesung Somersemester 2013, Ludwig-Maximilians-Universität, http://www.mathematik.uni-muenchen.de/~lenckner/2013--Folien-2013-07-02.pdf, (26.01.2014).

Milbrodt, H. (2005). Aktuarielle Methoden der deutschen Privaten Krankenversicherung, Heft 34, Schriftenreihe Angewandte Versicherungsmathematik, Verlag Versicherungswirtschaft, Karlsruhe.

Molt, C. (2010). Aktuelle Herausforderungen für die PKV, Universität Ulm, http://www.uni-ulm.de/fileadmin/website_uni_ulm/mawi.inst.140/Vortr%C3%A4ge/Vortrag_Christian_Molt.pdf, (05.02.2014).

Schneider, E. (2002). The main features of German private health insurance, 27th International Congress of Actuaries, Cancun/Mexico, http://www.actuaries.org/EVENTS/Congresses/Cancun/health_subject/health_16_schneider.pdf, (16.01.2014).

Schneider, E. (2003). Seminar Grundwissen Krankenversicherungsmathematik, Lecture notes. Deutsche Aktuar Akademie, Bonn, Germany.

Schmidt, J-P. (2010). Market Consistent Embedded Value in der privaten Krankenversicherung, Fakultät für Mathematik und Wirtschaftswissenschaften Universität Ulm, http://www.uni-ulm.de /fileadmin/website_uni_ulm/mawi2/forschung/preprint-server/2010/ 1012_mcev-pkv_01.pdf, (23.01.2014).

Sozialverband Nordrhein-Westfalen. (2008). Informationen für Sie zur Beitragsanpassung und zu unseren Service-Angeboten, http://www.vdk-online.de/Service/Newsletter/Newsletter_Archiv/2009/20091130_KV/2009-11_Kundeninformationen_zur_BAP_2010_-_1764303_Nov09.pdf?PHPSESSID=873e48da1780474a56c0ba91ec0939fd, (23.01.2014).

Türkiye Cumhuriyet Merkez Bankası. (2012). Döviz Kurları, http://www.tcmb.gov.tr/, (03.02.2014).

Türkiye İstatistik Kurumu. (2011). Gayri Safi Yurtiçi Hasıla 4. Dönem 2010, Haber Bültenleri Sayı: 8471, http://www.tuik.gov.tr/PreHaberBultenleri.do?id=8471, (25.01.2014).

Verband der Privaten Krankenversicherung. (2012). Zahlenbericht der Privaten Krankenversicherung 2012, https://bestellungen.pkv.de/w/files/shop_zahlenberichte/zahlenbericht_2012.pdf, (04.02.2014).