

THE ANALYSIS OF AVAILABLE AND REQUIRED SOLVENCY MARGIN OF NON-LIFE INSURANCE IN THE FRAME OF THE CZECH INSURANCE MARKET AT YEARS 2004 TO 2011

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Abstract

This paper deals with the statistical analysis of available and required solvency margin of non-life insurance in the frame of the Czech insurance market at years 2004 to 2011. Solvency refers to, as the Act No. 277/2009 Coll., ability of undertaking its own resources to ensure continued ability to meet liabilities arising from insurance or reinsurance activities. Monitoring the level of solvency of insurance companies is very important, not only with regard to determining their financial health. Another important aspect is whether the Czech insurance market, with regard to the insurance company financially healthy, is ready for the introduction of a new regulatory framework Solvency II. Individual consequences of the implementation of this framework to the management of insurance companies are still only estimates. Solvency II is to be gradually introduced from 2014, changing not only the possibility of calculating the solvency requirements, but also introduces various other measures.

Introduction

The concept of solvency is defined in the legislative framework of the Czech Republic in the Law on Insurance No. 277/2009 Coll. as ability of undertaking its own resources to ensure continued ability to meet liabilities arising from insurance or reinsurance activities. Meet commitments, means the proven ability to meet the insurance and reinsurance liabilities arising from insurance or reinsurance business, including obligations payable in subsequent accounting periods.

The Law on Insurance also defined the terms available solvency margin (*ASM*) and required solvency margin (*RSM*). The available solvency margin means the adjusted amount of own funds of an insurance or reinsurance. The required solvency margin means the minimum solvency margin.

1 Analysis of solvency margins

1.1 Basic survey of solvency margins

The Czech insurance market ranks with small insurance market, but the sum of available solvency margin of non-life insurance from insurance companies (from Czech insurance market) is in sum of year 2011 in the amount of CZK 28 265 million., required solvency margin is in sum of year 2011 in the amount of CZK 8 423 million. The percentage share of available solvency margin and required solvency margin of non-life insurance was 336% in year 2009.

There is a special book about calculation of capital adequacy in the finance and solvency in the insurance and about Solvency II [1], [2] and differences in calculation of solvency ratio within Solvency I and Solvency II are presented in the dissertation thesis [3].

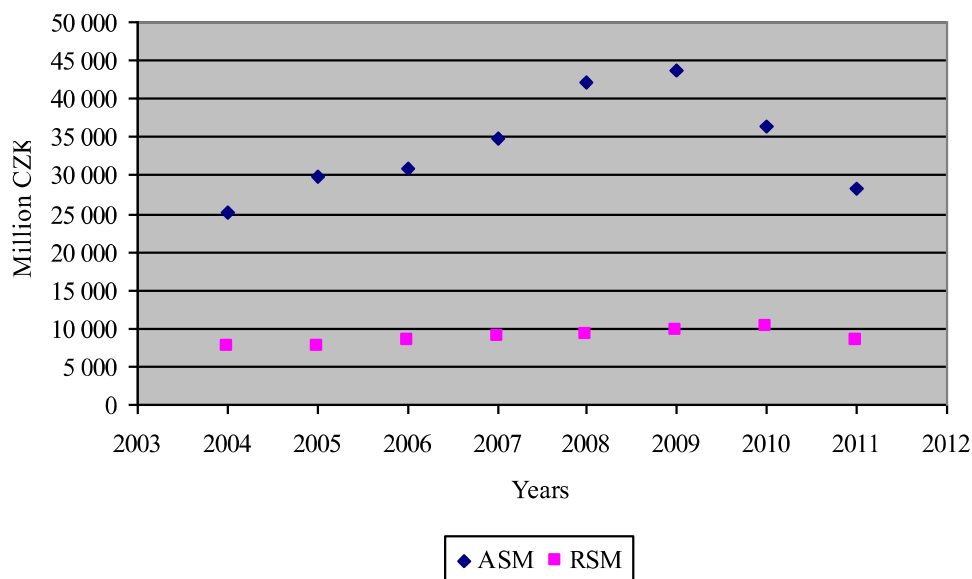
Tab. 1 shows data of development of available, required solvency margin and their share in non-life insurance in the frame of Czech insurance market. The trend of the development of *ASM* and *RSM* is illustrated in Fig. 1 and the development of percentage share of *ASM* and *RSM* is illustrated in Fig. 2. The higher the share *ASM/RSM*, the more favorable situation is for insurers, which indicates the amount of equity corresponds to its commitments. In another part of the article, both solvency margins are statistically analyzed in detail.

Tab. 1: Development of available and required solvency margin in non-life insurance in 2004–2011 (million CZK)

	2004	2005	2006	2007	2008	2009	2010	2011
ASM	25 113	29 760	30 936	34 841	42 230	43 654	36 367	28 265
RSM	7 546	7 696	8 400	8 848	9 172	9 722	10 258	8 423
Share ASM/RSM (%)	333%	387%	368%	394%	460%	449%	355%	336%

Source: self elaboration from [4], [5], [6]

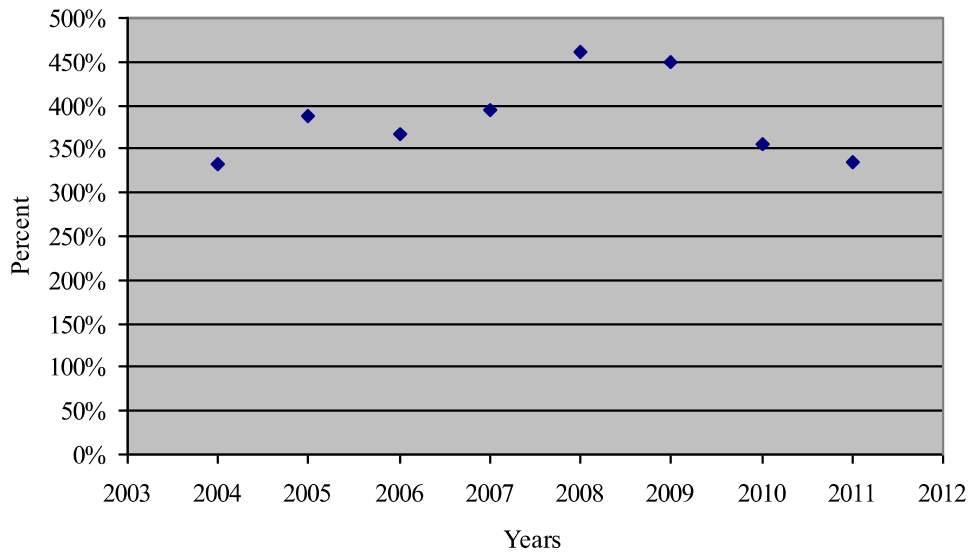
The results in Tab. 1 show that the share of *ASM* and *RSM* in the period is gradually increasing to 2011 in which you can observe a slight decrease.



Source: self elaboration from Tab. 1

Fig. 1: Development of available and required solvency margin in non-life insurance in 2004–2011 (CZK million)

According to the results of Fig. 2, the lowest share of *ASM/RSM* was in year 2004 in the amount of more than 330%, this share for seven years increased by only 6% to 336%, however between these two years the development of this ratio was very unstable.



Source: self elaboration from Tab. 1

Fig. 2: Development of percentage share ASM/RSM in non-life insurance in 2004–2011 (million CZK)

1.2 Statistical analysis

The values y_t for available solvency margin are in Tab. 2 and for required solvency margin in Tab. 3. The subscript t in next equations characterizes time period (in this paper one year).

The results of next five indicators [7]:

the first difference (absolute gain, $1\Delta t$), the second difference (1):

$${}_2\Delta_t = {}_1\Delta_t - {}_1\Delta_{t-1} \quad (1)$$

the growth coefficient (2):

$$k_t = \frac{y_t}{y_{t-1}} \quad (2)$$

the growth rate (3):

$$T_{y_t} = k_t \cdot 100 \quad (3)$$

the increase rate (4)

$$\delta_{y_t} = T_{y_t} - 100 \quad (4)$$

are presented for available solvency margin in Tab. 2 and for required solvency margin in Tab. 3.

The average absolute gain (5) and the average growth coefficient (6) belong to the important characteristics [7].

$${}_1\bar{\Delta} = \frac{\sum_{t=2}^n {}_1\Delta_t}{n-1} = \frac{y_n - y_1}{n-1} \quad (5)$$

The results of average absolute gain is for available solvency margin CZK 450 285 714 and for required solvency margin CZK 125 285 714.

$$\bar{k} = n^{-1} \sqrt{\frac{y_n}{y_1}} \quad (6)$$

where n is the number of values (in this paper $n = 6$).

The results of average growth coefficient are for available solvency margin 0.992664052 (which corresponds to 0.73% decrease) and for required solvency margin 1.04784757 (which corresponds to 4.79% growth).

Tab. 2: Elementary characteristic development of available solvency margin

Year	Available solvency margin (million CZK) (y_t)	${}_1\Delta t$	${}_2\Delta t$	k_t	T_{yt}	δ_{yt}
2004	25 113	×	×	×	×	×
2005	29 760	4 647	×	1.185044	118.5044	18.50436
2006	30 936	1 176	-3 471	1.039516	103.9516	3.95161
2007	34 841	3 905	2 729	1.126228	112.6228	12.62283
2008	42 230	7 389	3 484	1.212078	121.2078	21.20777
2009	43 654	1 424	-5 965	1.033720	103.3720	3.37201
2010	36 367	-7 287	-8 711	0.833074	83.3074	-16.69260
2011	28 265	-8 102	-815	0.777216	77.7216	-22.27840

Source: self elaboration from Tab. 1

Tab. 3: Elementary characteristic development of required solvency margin

Year	Available solvency margin (million CZK) (y_t)	${}_1\Delta t$	${}_2\Delta t$	k_t	T_{yt}	δ_{yt}
2004	7 546	×	×	×	×	×
2005	7 696	150	×	1.019878	101.9878	1.98781
2006	8 400	704	554	1.091476	109.1476	9.14761
2007	8 848	448	-256	1.053333	105.3333	5.33333
2008	9 172	324	-124	1.036618	103.6618	3.66184
2009	9 722	550	226	1.059965	105.9965	5.99651
2010	10 258	536	-14	1.055133	105.5133	5.51327
2011	8 423	-1 835	-2 371	0.821115	82.1115	-17.88850

Source: self elaboration from Tab. 1

According to the analysis results listed in Tab. 2, the largest annual increase of *ASM* was in the year 2008 in the amount of CZK 7 389 million with the growth coefficient 21.2% and the largest annual decline of *ASM* was in the year 2011 in the amount of CZK (-) 8 102 million with the coefficient of decrease 22.28%.

According to the analysis results listed in Tab. 3, the largest annual increase of *RSM* was in the year 2006 in the amount of CZK 704 million with the growth coefficient 9.14% and the largest annual decline of *RSM* was in the year 2011 in the amount of CZK (-) 1 835 million with the growth coefficient 17.89%.

The number of insurance companies by percent share of *ASM/RSM* in non-life insurance illustrated Tab. 4.

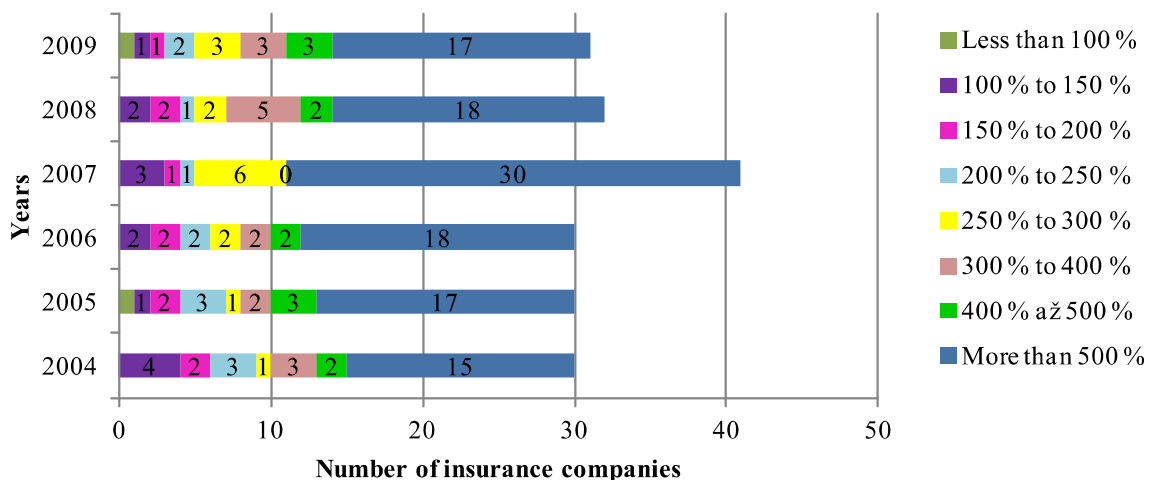
According to the values listed in Tab. 4 the highest number of insurance companies by percent share of *ASM/RSM* has the share more than 500%. These values from Tab. 4 are graphically shown in Fig. 3 and in percent share from total insurance companies are given in Tab. 5.

Tab. 4: Number of insurance companies by percent share of *ASM/RSM* in non-life insurance

Number of insurance companies	2004	2005	2006	2007	2008	2009	2010	2011
Less than 100%	0	1	0	0	0	1	–	–
100% to 150%	4	1	2	3	2	1	–	–
150% to 200%	2	2	2	1	2	1	–	–
200% to 250%	3	3	2	1	1	2	–	–
250% to 300%	1	1	2	6	2	3	–	–
300% to 400%	3	2	2	0	5	3	–	–
400% to 500%	2	3	2	0	2	3	–	–
More than 500%	15	17	18	30	18	17	–	–
TOTAL	30	30	30	41	32	31	–	–

Source: self elaboration from [4], [5]

Fig. 3 shows that the number of insurance companies, which have a ratio of *ASM* and *RSM* from 100% to 150% from 2007, this number is decreasing as the number of insurance companies this share is more than 500%.



Source: self elaboration from Tab. 4

Fig. 3: Number of insurance companies with different ratio of *ASM* and *RSM*

As seen from Tab. 4, in 2007 11 insurance companies were added to the insurance market. This leap does significantly influence the *ASM* but not the *RSM* (see Tab. 4) in the year 2008 (with one-year delay). For the years 2010 and 2011 there are missing data – for this period the Czech National Bank (CNB) has not such data, and just development of solvency in the last two years would be very interesting.

Tab. 5: Number of insurance companies in percent by percent share of ASM/RSM in non-life insurance

Percentage of insurance companies	2004	2005	2006	2007	2008	2009	2010	2011
Less than 100 %	0%	3%	0%	0%	0%	3%	–	–
100 % to 150 %	13%	3%	7%	7%	6%	3%	–	–
150 % to 200 %	7%	7%	7%	2%	6%	3%	–	–
200 % to 250 %	10%	10%	7%	2%	3%	6%	–	–
250 % to 300 %	3%	3%	7%	15%	6%	10%	–	–
300 % to 400 %	10%	7%	7%	0%	16%	10%	–	–
400 % to 500 %	7%	10%	7%	0%	6%	10%	–	–
More than 500 %	50%	57%	60%	73%	56%	55%	–	–
TOTAL	100%	100%	100%	100%	100%	100%	–	–

Source: self elaboration from Tab. 4

The results in Tab. 5 about the financial health of insurance companies in the Czech insurance market, offering non-life insurance, suggests that in 2009 had 91% of insurers share of ASM and RSM greater than 200 %, which is very satisfactory result in non-life insurance.

Conclusion

The article deals with the statistical analysis of one of the most important tools for identifying the financial health of insurance companies offering non-life insurance in the Czech insurance market for the period 2004 to 2011. It's clear from the analysis mentioned in the article that most insurance companies, 91% (in 2009), have the share of *ASM* and *RSM*, and is greater than 200%, which can be considered as quite a satisfactory result. It should be noted that in non-life insurance in recent years, often with the term “unknown unknowns” (Future circumstances, events, or outcomes that are impossible to predict, plan for, or even to know where or when to look for them. [8]), but their does not yet factor in the amount of insurance or reinsurance to insurance protection. Another important fact is that the development of *ASM* has recorded a steady decline since 2009, as well as the development of *RSM* declined in the last year. *ASM* and *RSM* decrease can be explained by the introduction of Solvency II requirements into the management of insurance companies.

Acknowledgements

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ANALÝZA DISPONIBILNÍ A POŽADOVANÉ MÍRY SOLVENTNOSTI NEŽIVOTNÍCH POJIŠTĚNÍ V RÁMCI ČESKÉHO POJISTNÉHO TRHU V LETECH 2004 AŽ 2011

Tento článek se zabývá statistickou analýzou disponibilní a požadované míry solventnosti neživotních pojištění v rámci českého pojistného trhu v letech 2004 až 2011. Solventností se rozumí, dle zákona č. 277/2009 Sb., schopnost pojišťovny nebo zajišťovny zabezpečit vlastními zdroji trvalou splnitelnost závazků z pojišťovací nebo zajišťovací činnosti. Sledování míry solventnosti pojišťoven je velmi důležité, a to nejen s ohledem na určování jejich finanční zdraví. Dalším důležitým aspektem je, zda český pojistný trh, pokud jde o finančně zdravé pojišťovny, je připraven na zavedení nového regulačního rámce Solventnost II. Jednotlivé důsledky zavádění tohoto rámce na hospodaření pojišťoven jsou stále jen odhadovány. Solventnost II má být postupně zaváděna od roku 2014, mění nejen možnost výpočtu solventnosti, ale také zavádí řadu dalších opatření.

ANALYSE DER TATSÄCHLICHEN UND DER GEFORDERTEN SOLVABILITÄTSSPANNE NON-LEBENSVERSICHERUNG IN DEN TSCHECHISCHEN VERSICHERUNGSMARKT FÜR DEN ZEITRAUM 2004 BIS 2011

Dieser Artikel beschäftigt sich mit der statistischen Analyse der verfügbaren und der geforderten Solvabilitätsspanne von Nicht-Lebensversicherungen in den tschechischen Versicherungsmarkt 2004 bis 2011. Solvency Mitteln, gemäß dem Gesetz Nr. 277/2009 Slg., Die Fähigkeit des Unternehmens, ihre eigenen Ressourcen zu sichern, um dauerhafte Verpflichtungen aus Versicherungs- oder Rückversicherungsunternehmen Tätigkeiten gerecht zu werden. Die Überwachung der Solvabilitätsspanne von Versicherungsunternehmen ist sehr wichtig, nicht nur im Hinblick auf die Bestimmung ihrer finanziellen Gesundheit. Ein weiterer wichtiger Aspekt ist, ob die tschechischen Versicherungsmarkt in Bezug auf finanziell solide Versicherungsgesellschaft bereit, einen neuen Rechtsrahmen Solvency II einzuführen. Einzelne Folgen der Umsetzung dieses Rahmens über die Verwaltung von Versicherungen nach wie vor nur geschätzt. Solvency II ist die schrittweise ab 2014 eingeführt werden, verändern nicht nur die Möglichkeit der Berechnung der Solvabilität, sondern führt auch eine Reihe anderer Maßnahmen.

ANALIZA DOSTĘPNEGO I WYMAGANEGO MARGINESU WYPŁACALNOŚCI UBEZPIECZEŃ MAJĄTKOWYCH W RAMACH CZESKIEGO RYNKU UBEZPIECZEŃ W LATACH 2004 DO 2011

Ten artykuł dotyczy analizy statystycznej dostępnego i wymaganego marginesu wypłacalności ubezpieczeń majątkowych w czeskim rynku ubezpieczeń od 2004 do 2011. Oznacza wypłacalności, zgodnie z ustawą nr 277/2009 Dz.U., zdolność przedsiębiorstwa do zabezpieczenia swoich zasobów stałych w celu wypełnienia zobowiązań od zakładów ubezpieczeń lub zakładów aktywności. Monitorowanie marginesu wypłacalności firm ubezpieczeniowych jest bardzo ważna, nie tylko w odniesieniu do określenia ich kondycji finansowej. Innym ważnym aspektem jest to, czy czeski rynek ubezpieczeniowy w zakresie finansowo dźwięku firmy ubezpieczeniowej, jest gotowy do wprowadzenia nowych ram regulacyjnych Solvency II. Indywidualne skutki realizacji niniejszego programu ramowego w sprawie zarządzania firm ubezpieczeniowych nadal są tylko szacunkowe. Solvency II ma być stopniowo wprowadzany od 2014 r., zmieniając nie tylko możliwość obliczania wypłacalności, ale wprowadza również szereg innych środków.