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CHOOSING DISCOUNT RATE FOR THE EVALUATION OF INSURANCE LIABILITIES

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Abstract. The starting EU Solvency II requirements and future accounting standards will require discounting for all of insurance liabilities. A properly chosen discount rate could guarantee the value of insurance liabilities being adequate and market consistent. In small economies this is difficult to achieve due to the unavailability of deep and liquid market for bonds. The authors of the present paper analyze if these market limitations could be bypassed and the discount rate's term structure could be established. The research is based on the data from the Lithuanian financial market and aims at proposing an innovative approach to discount rate setting which could be used by insurance companies.

JEL classification: G22, G23.
Keywords: discount rate, insurance liabilities, technical provisions, time value of money, risk-free rate.
Reikšminiai žodžiai: diskonto norma, draudimo įsipareigojimai, techniniai atidėjiniai, pinigų laiko vertė, nerizikinė norma.

Introduction

The valuation of insurance liabilities is a topic which currently causes apprehension for the whole insurance industry. Solvency II project, which recently not only became an object of discussion on the academic level, but also emerged as an unavoidable necessity due to an obligation to be implemented in the nearest future, should also take its share of responsibility in this regard. The brand new European Union (hereinafter referred to as the EU) framework directive in this regard presents the European attitude to the valuation of modern insurance liabilities and emphasizes the importance of the present value of expected future cash-flows and discount rates. The International Financial Reporting Standards (hereinafter referred to as IFRS) also move in this way and already in the Discussion Paper (hereinafter referred to as the DP) on Phase II of IFRS 4 (Insurance Contracts) requirements emphasizes the importance of the time value of the insurance liabilities. There also exist other academic investigations and modern practices dealing with the question of discounting in insurance accounting. However, a very small part of the studies really touch such a sensitive subject as the choice of the relevant discount rate in the small economy environment, where the securities denominated in the local currency are not traded in a liquid and deep market.

This research presents new legal and regulatory requirements applied for an insurance company will-

ing to choose the relevant discount rate for its insurance liabilities. The authors analyze different compound elements of discount rate and possibility to evaluate them correctly in a small economy environment based on the case of Lithuania. What is more, this paper introduces guidelines for setting up the discount rate for insurance liabilities not only consistent with future Solvency II requirements, but also conforming to the principles of future IFRS standard on insurance contracts.

1. Current Legal and Regulatory Environment

The calculation of the discount rate for insurance technical provisions nowadays is usually understood as a market variable which could significantly influence the result of insurance liabilities valuation (Duverne, 2008; Howarth 2009). In the past, discount rate was more a technical term used in insurance business to describe the internal rate of guarantee incorporated in the endowment or whole life assurance policy. This type of guarantee was usually fixed for the duration of insurance policy and was not supposed to be changed until the lump sum was paid according to the insurance policy conditions. For this reason the concept of discounting in insurance for many years was understood as the concept of smoothing the value of life assurance liability during the duration of contract. The discount rate was calculated according to the level of yield guarantee provided for in the policy and was fixed at the inception. Further changes in the market yield or interest rate did not influence this discount rate and value of insurance liabilities.

This practice is now changing very rapidly. Despite the fact that practices for insurance liabilities valuation still vary from country to country and Phase II of IFRS 4 is still under discussion, one tendency is recognized by many researchers (IAA, 2009; Tsai, 2009; Babbel, 2002; Buck, 2009)—the value of insurance liabilities should be estimated by recognizing its time value. In the nearest future this practice will be applied not only for life assurance contracts, but also for property-liability insurance contracts and will have significant influence on the financial results of an insurance company. For this reason it is very important to use the relevant interest rate for the discounting of insurance liabilities and to ensure its comparability with the discount rates applied for similar liabilities (defined benefit pensions, financial guarantees, non-insurance provisions, etc.) internationally.

The need to evaluate technical provisions by discounting future cash-flows in the EU was officially recognized in the European Commission Directive 2002/83/EC concerning life assurance (recast version) (hereinafter referred to as the Life Assurance Directive), which required under Article 20.1 to use 'sufficiently prudent prospective actuarial valuation' for life assurance provisions and which was particularly specific in describing the need to use a prudently chosen interest rate. The 'prudency' of choosing an interest rate was further ensured by the requirement for a competent authority to set a single maximum rate of interest according to the currency in which the contract is denominated and was also limited to 60% of the yield on bond issues by the country in question.

In practical terms, this requirement of the Life Assurance Directive forced life assurance companies to use the discount rate which was significantly below the risk-free interest rate as it is understood today. For some EU countries with AAA sovereign credit ratings, were the market for government bonds was liquid and deep, the yield on government bonds has been low for decades. For example, the yield on German Bunds (10-year government bonds) has been fluctuating at 3.2–4.5% level for many years already. The subprime loans crisis seems to change this tendency very little as even during the time of financial crunch, where the governments of all major Western economies are in great demand for resources, the Bunds are sold at yield equal to or below the pre-crisis level. According to the Bloomberg, EUR 4.9 billion (US$7 billion) of the Bundesbank securities were sold on 6 January 2010 at an average yield of 3.38%. The difference in yield, or spread, between German and U.S. 10-year bond yield was equal to 43 basis points and was insignificant for other major economies as well.

If one applies the restrictions set in the Life Assurance Directive, the single discount rate for euro/dollars-denominated insurance liabilities would be at an incredibly low level (in this case 2.028% for euro-denominated liabilities and 2.286% for dollar-denominated liabilities on 06/01/2010). For an EU Member State which chooses to use the yield on euro zone government bonds as the basis for technical discount rate calculation this restriction still has a huge influence (Figure 6) and diminishes the comparative attraction for long term investors in life assurance business as they could measure their non-insurance liabilities by using the higher yield based on corporate bonds or other financial instruments. One could argue that this makes this requirement of the Life Assurance Directive over-prudent and even non-consistent with the modern practice of discounting. Despite that, this European practice has its own hidden logic. As the yield on bond not only depends on the time value of contracts, but also includes a spread for credit risk which shows the investors' evaluation of government default risk, the Life Assurance Directive seems to encourage prudent and

risk-neutral discounting. As implicit spread for default risk is difficult to separate from the nominal yield in an objective manner, the EU decided to use a 'simplified' approach for interest rate calculation. For that reason, using the premise that the average spread for government default risk could be around 40% for the yield on government bonds (IAA, 2009, p. 49), the 'pure' risk-free interest rate could exactly be valued at 60% yield level.

However, the practice for choosing discount rates in the EU is not so straightforward. Each country adopted own approaches to the calculation of life assurance technical provisions as insurance regulation leaves some freedom in this regard. There are Member States which use a single discount rate for all life assurance provisions (Lithuania being one of them), but there are also several Member States which for that purpose use the term structures of government bonds' interest rates in each of the world major currencies based on their swap curves or risk-free recalculation (for example, the UK and the Netherlands). As practices applied through the Europe vary significantly, insurance groups doing business in more than one EU Member State are interested in harmonizing this approach.

The issue of discounting is becoming the main question for non-life insurers as well, as the pressure to present the fair value of claims provisions grows each day not only from the International Accounting Standards Board (hereinafter referred to as the IASB) side (IFRS 4 Phase I requirements and the Discussion Paper on Phase II accounting), but also from local supervisory authorities and CEIOPS in particular. The latest change in local GAAP rules and Quality Impact Studies 1-4 organized by CEIOPS emphasize the importance of discounting in all the spheres of insurance business: beginning with the calculation of risk margin of insurance liabilities by using the Cost of Capital (CoC) method, ending with the evaluation of Solvency II requirements.

The recently issued Solvency II (2009) EU Framework Directive and CEIOPS Level 2 Advice on risk-free rate (CEIOPS, 2009) are therefore especially important in this matter. The brand new European directive is supposed to establish a new harmonized practice for insurance liabilities valuation, requiring to calculate the best estimate of technical provisions in accordance with their nature or risk. The only exemption from this rule is applied for technical provisions valued at fair values. However, even the fair value measurement seems to include discounting, as Article 76(2) of the EU Framework Directive stipulates that best estimate shall correspond 'to the probability-weighted average of future cash-flows, taking account of the time value of money (expected present value of future cash-flows), using the relevant risk-free interest rate term structure' (Solvency II). So there is no single notion of Government bond interest rate left in the EU Insurance Directive and, even more importantly, the 60% yield rule is also abandoned by replacing it with a more simplistic, but not really simply-calculated 'risk-free interest rate' notion. To assure the harmonization of risk-free interest rate calculation, the EU Commission, in Article 86 of the same directive, promise to adopt implementing measures laying down the relevant risk-free interest rate term structure.

Still, the new EU directive seems not to answer the question regarding the basis to derive the risk-free component from market interest rates. As there are a variety of approaches to this type of derivation, the issue still leaves many questions unanswered. The CEIOPS in its Level 2 Advice (CEIOPS, 2009) have shed some light on this topic, presenting the combined view of EU insurance supervisors on the risk-free interest rate term structure. But even this CEIOPS paper, despite its comprehensive analysis of the related issues, is not giving any clear guidance for setting up the interest rate term structure for non-euro zone economies.

To present the whole picture related to the right choice of the discount rate for insurance liabilities, we should remember two other international developments which could be of great importance for the present analysis: evolving IFRS standard on insurance contracts accounting (Duverne, 2008) and the Market-Consistent Embedded Value (hereinafter referred to as the MCEV) practice approved by the European Insurance CFO forum (Buck, 2009).

What regards the IASB project on insurance, there is still only a Discussion Paper 'Preliminary Views on Insurance Contracts', issued on 3 May 2007, to project a possible vector for this standard development. For example, Article 69 in this Discussion Paper provides that the discount rate for insurance liabilities 'should be consistent with observable current market prices for cash flows whose characteristics match those of the insurance liability, in terms of, for example, timing, currency and liquidity' indicating a different approach to setting up a discount rate as it is used in Solvency II Directive. Actually, this approach could take a totally different direction, as it emphasizes not only the need to include the credit risk spread of interest rate, but even the 'market price' for liquidity which does not correspond to the CEIOPS considerations on the inclusion of an illiquidity premium into the discount rate (CEIOPS, 2009). As from a financial perspective illiquidity premium is defined as the additional compensation that investors require for bearing the risk from an illiquid asset, compared with the return on a liquid asset, this premium consequently should be added to risk-free rate. This increase in discount

rate will decrease the discounted value of insurance liabilities and therefore, according to the majority of EU insurance supervisors, should not be allowed.

The risk that the IASB will call to use a rate based on a different than risk-free interest rate as the discount rate for insurance liabilities, mentioned in Solvency II Directive, is really significant. In the context of the recently introduced changes in the International Accounting Standard (hereinafter referred to as the IAS) 19, where the former freedom to use discount rate for the measurement of employee benefit obligations by references to government bonds or corporate bonds yield was revoked and only the reference to the market yield on high quality corporate bonds (usually AA or equivalent credit rating) was left, this seems even more plausible. It is worth mentioning that other accounting standards setters such as the Financial Reporting Council (UK) (hereinafter referred to as the FRC) in its Financial Reporting Standard 17 'Retirement benefits' (Art. 32-34) or the Financial Accounting Standards Board (US) in its Financial Accounting Standard 158 use similar discounting policy for the evaluation of employee benefit obligations. FRC acknowledges that such a discount rate will reflect the time value of money and a small premium for risk. The latter element is added (FRC, 2010) to reflect the options that the employer has to reduce the assumed scheme liabilities, including *in extremis* the option of closing down the scheme.

These requirements could be compared with another modern practice, i.e. the MCEV calculation principles originally issued by the CFO Forum in June, 2008, but recently (in October, 2009) updated to reflect the changes in the attitude towards liability discounting. These principles are oriented to help life assurance companies present the 'embedded value' in their life assurance business (future insurance premiums, claims and related expenses) as well as to help a company's shareholders measure the future profit generation possibilities more objectively. For that purpose, the realistic present value of life assurance liabilities is of greatest importance and the MCEV principles are explicitly focused on the establishment of a harmonized approach towards the setting up of a discount rate which could correctly reflect the time value of money and all the characteristics of liabilities in question. According to Principle 14, while calculating the MCEV where the liabilities are not liquid, the discount rate should be the swap yield curve with the inclusion of a liquidity premium, where appropriate. This approach is similar to the view expressed by the IASB but very different from the view expressed in Solvency II Directive or CEIOPS Level 2 Advice.

2. Components of the Calculation of the Discount Rate for Insurance Liabilities

Articles 27 and 29 of IFRS 4 included a presumption that an insurer's financial statements will become less relevant and reliable if the insurer starts to use a discount rate that reflects the estimated return on the insurer's assets. This approach is supported by other researchers and the discount rate for insurance liabilities evaluation is usually supposed to be independent from the yield on own investment portfolio. The only exemption from this rule seems to apply to unit-linked and index-linked life assurance liabilities (IAA, 2001; IAA, 2009; FRC, 2010), where in the case of specific liability floor or cap guarantee there is a need to match the change in insurance liabilities with the movements in corresponding assets value. For that purpose our further analysis will be limited to non-unit-linked business insurance liabilities.

According to Solvency II Directive, the discount rate for insurance liabilities should be based on risk-free interest rate. The issue regarding the interest rate benchmarks available in the financial market that could be used for that purpose, however, remains to be decided.

In the UK, actuaries have traditionally discounted the liabilities in a defined benefit scheme at the expected rate of return on the assets in the scheme (prudently estimated). As IFRS 4 standard do not recognize this practice, we should look at IAS 19 (revised) and FAS 87 that require the use of a high quality corporate bond rate for this purpose. This will help us to understand the difference between the Solvency II proposal to use risk-free rate and the requirement of the abovementioned standards to use higher rate associated with entity risk.

Historically the yield on government bonds and corporate bonds has always been significantly different. As a government has more favorable conditions to return its debts than a separate company (for example, benefitting from each citizen's pocket by issuing new tax law or nationalizing a part of private property), the yield on government bonds has always been a benchmark for setting up a 'risk-free' discount rate, and the yield on corporate bonds has always been higher than the yield on government bonds as it, theoretically, includes additional risk spread above the risk-free rate.

However, the recent crisis (especially the cases of Argentina and many other less-developed countries), has shown that governments are also prone to bankruptcy risk. The financial turmoil in these years has also changed the classical view to the 'risk-free' notion. As it is seen in Figure 1 which shows two credit default swaps (CDS) indexes (one for major European economies and one for European invest-

ment grade companies), during the last 2 years (middle of 2009 and start of 2010) the investors had already two times valued the risk of government bankruptcy as nearly equal to the risk of the bankruptcy of major companies.

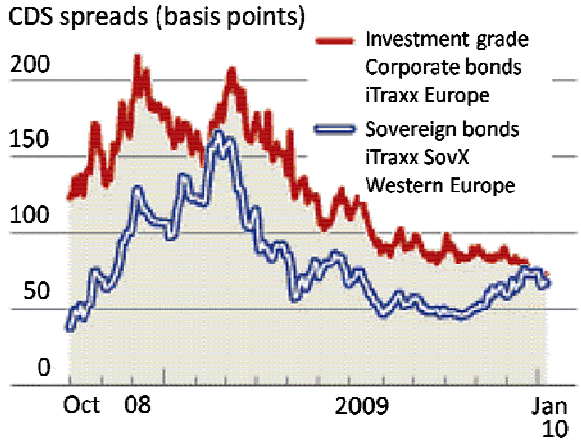

Figure 1. The dynamics of sovereign and corporate bonds spreads in Europe
Source: Markit; Financial Times

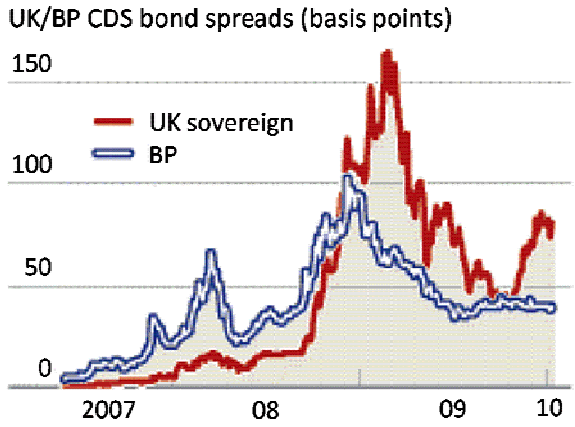

Figure 2. The dynamics of UK sovereign and British Petroleum (BP) bonds spreads
Source: Markit; Financial Times

This unprecedented development becomes even more striking when the CDS prices on bonds of a particular country are compared to the price on the bonds of the biggest private companies located in that country (analyzing bonds denominated in the same currency). As we can seen in Figure 2, the CDS prices for UK bonds are for a historically incredibly long period higher than the CDS prices for British Petroleum (BP). This development could change the typical understanding of discount rate setting by eliminating the principal difference between these two investment instruments. Therefore, the measurement differences in the general purpose financial reporting requirements and the prudent requirements set in the Solvency II Directive could be not such a significant as they were in the past.

3. Impeding Market Restraints

As the major part of life assurance provisions and a significant part of property insurance provisions are classified by the insurance companies as long-term provisions which are paid out as insurance claims only after 5 or even 30 years, the discount rate should be chosen also with reference to the bonds with similar maturity. This matching requires (CEIOPS, 2009) to check if the discount rate has the corresponding quality, i.e. is highly liquid for all maturities. The problem is that a small government bonds market, as it is in Lithuania, has significant limitations in terms of availability and liquidity for the bonds with long-term maturity. As only bonds of local government in the world are denominated in the currency that matches the currency of insurance liabilities, further analysis will be focused on the market for these bonds.

By analyzing the data for the period between 1999 and 2010, one can see that the first auctions for litas-denominated bonds with maturity of more than 5 years were first organized only in spring of 2001 and 2002 (Table 1).

Table 1. The first auctions of long-term Lithuanian Government bonds
Source: Bank of Lithuania, analysis by authors

Nominal term of the bond (in years)	First auction date
2	1 February 1999
3	28 March 2000
5	31 October 2000 (foreign market); 28 May 2001 (internal market)
7	12 March 2001
10	18 March 2002

Even the bonds with shorter maturity were scarce and late to arrive. For example, the first auction for 2-years government bonds was held only on 1 February 1999 and for 5-years bonds only on 28 March 2000. Till now, for the bonds with longer than 5-years maturity just 13 government bond issues have been organized, and the first auction for government bonds with 10-year maturity was held only on 18 March 2002. This causes significant difficulties for insurance companies willing to establish a coherent interest rate term structure which could be used for insurance liabilities discounting and raises these particular issues:

1. market for longer than 10-years government bonds is absent and the relevant interest rates for liabilities of longer duration are not available.

2. shorter than 10-years bonds are not available for all durations (4, 6, 8 and 9-years bonds are not available). As the market for Lithuanian Government bonds is not deep and liquid enough, the typical interpolation technique used in similar cases could be also only partially suitable in this situation.

3. market for indefinite term bonds and inflation-linked bonds is not available and, according to the Lithuanian Government long-term strategy, will not be organized in the near future. As these bonds are used as the main basis for choosing the discount rate for annuities and other ultra long-term life assurance products, even more obstacles for building a term structure for litas-denominated liabilities are created.

While analyzing the frequency of the issues of public bonds, at first glance, the Lithuanian market seems to have a very sketchy emission pattern. The period of 2001–2005 was exceptional for the Lithuanian Government due to the global investment environment which provided benevolent borrowing conditions; during this period the Government was tapping the bond market more frequently. Bond emissions were organized often and the size of issues was moderate, which helped to guarantee not only the necessary coverage by the demand from the investor side, but also the constant inflow into the Government bonds market. However, since 2005 the number of auctions fell sharply and became more concentrated to the beginning of the year (3).

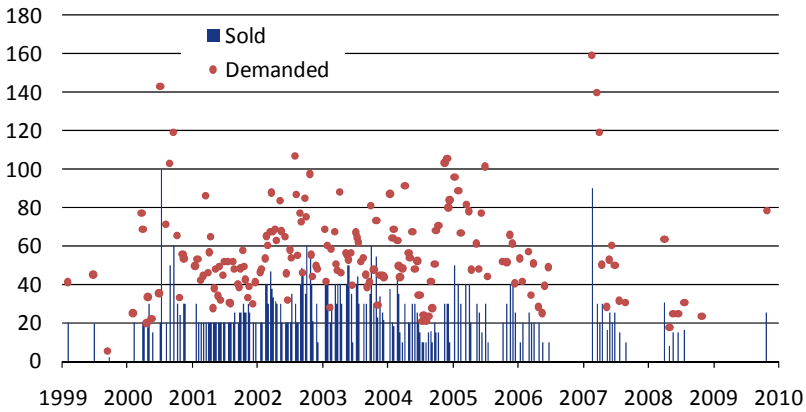

Figure 3. Auctions of Lithuanian Government bonds
Source: Bank of Lithuania, calculations by authors

In year 2008, the Lithuanian Government, in accordance with the borrowing and debt management strategy published by the Ministry of Finance (2009), was funding a major part of borrowing demand by issuing securities in domestic and foreign markets. To balance the public deficit from this year, only short-term borrowing arrangements have been used and in October 2008 the last emission of bonds with longer than 5-years maturity was issued. This situation makes it difficult for insurance companies not only to derive the discount rate for long term insurance liabilities, but also to match assets with the liabilities, as in Lithuania debt securities usually consist 70–90% of typical insurer's investment portfolio (ISC, 2007-2009).

The Lithuanian Government bonds liquidity is assured by a rarely applied measure—additional issues of bonds which helped to increase the amount of bonds traded in the secondary financial market. In many cases, these additional and only in internal market organized emissions assured the increase in the issues of bonds to the amount of LTL 400–500 million. Despite this liquidity patching, the demand for litas-denominated bonds was not very impressive even during the best times and decreased to a dangerously low level since the beginning of the credit crunch in 2008. During this year, the issues of short-term bonds were often sold in auctions without necessary demand to assure supply coverage (in 2008, the amount of issues, which were not covered by the adequate demand increased by 140.8%). Issues of long-term bonds decreased by 28.4% as well (Ministry of Finance, 2009).

Insufficient demand for Lithuanian Government bonds and doubts about the default risk, raised by the consequences of the financial crisis in neighbour Latvia and by the total banking system default in Iceland, had forced the yield on bonds to grow constantly and on 15 December 2008 they reached the peak with 12.39% (Ministry of Finance, 2009). This incredibly high yield for only 3-months-term securities was influenced by the investors' evaluation of the country default risk, which, since the beginning of the credit crunch, started to be measured according to the country's CDS price.

The lack of confidence which influenced the country's possibilities to issue securities in the primary market and the lack of alternative profitable investment for the risk-averse institutional investors made a huge impact on the secondary market. Comparing the data of 2007 and 2008, it is possible to see the decrease in the amount of actively traded Government bonds by LTL 244.2 million to the amount of LTL 546.5 million. It seems that this change was also related to the decision of

some investors to freeze the movements in debt securities portfolio and to hold the profitable Government bonds to their maturity, instead of the earlier practice to trade actively in secondary Government bonds market.

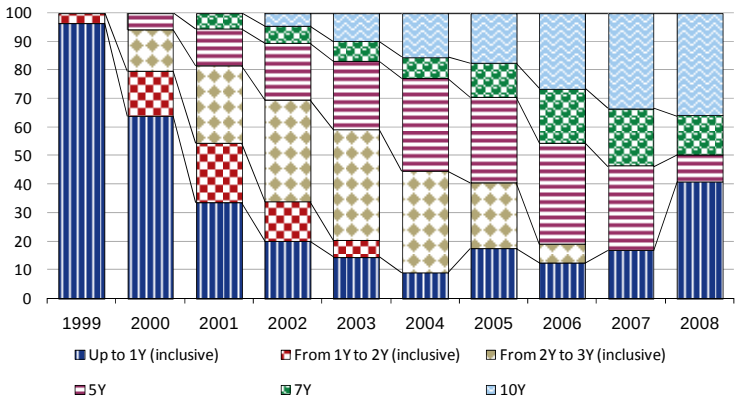

Figure 4. The structure of Lithuanian Government bonds; break-down by nominal term
Source: Ministry of Finance

What regards the investment portfolio of Lithuanian insurance companies and pension funds, another tendency is observed: during the credit crunch period these institutional investors started to invest more in Government bonds. The share of Government bonds in the investment portfolios of these investors increased on average from 26.5% in 2007 to 27.2% in 2008 (ISC, 2009). As a similar tendency has been observed world-wide, not only the demand for such bonds was increased, but also the yield rates (especially for bonds with longer maturity) were influenced.

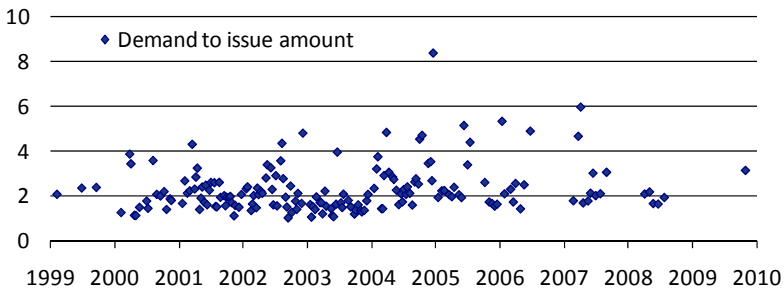

Figure 5. Proportion of demand vs. supply
Source: Bank of Lithuania, calculations by authors

The development of the demand and supply for Lithuanian Government bonds shows that historically, in the period of 1999–2009, the investors demand for these bonds on average was 2.3 times bigger than the supply of bonds (Figure 5). In the years 2005–2007, this ratio increased even to 6–8, but dropped significantly during 2008 and balanced on the level where the demand was only 2 times bigger than supply.

The increase in the demand for Lithuanian Government bonds since the entrance into the EU (on average it was 3 times bigger than supply) was directly influencing the yield on these bonds. The yield decreased to the level similar to the yield on Bunds, and for the bonds of the same term a level only 68 basic points bigger than the yield on the German Government bonds (accordingly 3.93% and 3.25%) was reached. This pre-crisis situation forced insurance companies to use an incredibly low discount rate for their insurance liabilities (Figure 6), which was 2–5 times lower than that, which has been applied by pension schemes providers in the Western Europe or the U.S. during the last decade of the twentieth century. This contradiction is one of the reasons to treat the former methodology for insurance discount rate calculation which had been applied till 2007 as deficient.

5. Choosing the Calculation Base

When calculating life assurance technical provisions, assurance undertakings discount future cash flows by using a conservative discount rate that may not exceed the maximum technical interest rate (MTIR) approved by the Insurance Supervisory Commission[1]. Till 2007, the MTIR used to be determined on a quarterly basis as 60% of the weighted average of the annual average yield on not shorter than 5-year nominal term bonds issued by the Government of the Republic of Lithuania in LTL ($\bar{r}$), calculated on the basis of the issues of the past 12 calendar months. This discount rate could not exceed 3.5% absolute limit:

$$MTIR = \min(\bar{r} \times 0.6;\ 3.5)\ , \text{ where}$$

$$\bar{r} = \frac{\sum_{i \in I} r_i \times N_i}{\sum_{i \in I} N_i},$$

$$I \equiv \left\{ i : \quad t_i \geq 5\text{Y} \text{ and } d_i \in [T - 12\text{M}; T] \right\}.$$

[1] Before the introduction of MTIR calculation methodology, the contractual rate of return was used as the discount rate for the evaluation of insurance liabilities.

Here N_i is a total sum (in LTL) of *i*-th bond sold on auction date; t_i denotes the nominal term of *i*-th bond in years; d_i is the date of the auction of *i*-th bond; T is the reference date.

The procedure for the calculation of the maximum technical interest rate complies with one of the methods indicated in Directive 2002/83/EC of the European Parliament and of the European Council concerning life assurance. Life assurance undertakings were obliged to apply the maximum technical interest rate calculated on a quarterly basis not only to newly concluded life assurance contracts, but also to those concluded earlier. A transitional period was set for the implementation of this decision—the maximum technical interest rate has been applied to all insurance contracts since 1 January 2007.

According to the Insurance Supervisory Commission, this decision was aimed at ensuring the interests of the policyholders, the insured, and beneficiaries under life assurance contracts. However, due to the constant decrease of the maximum technical interest rate since the beginning of calculation (this tendency changed only in the second quarter of 2006), the amount of life assurance technical provision (implementing the provisions of the resolution regarding the application of the maximum technical interest rate to previously concluded life assurance contracts) was growing rapidly thus increasing the loss of insurance undertakings. In the majority of other EU Member States, the newly calculated maximum technical interest rate was only applied to newly concluded life assurance contracts (ISC, 2007).

Taking into consideration the fact that along with the decrease in the borrowing need of the state, long-term bonds are rarely issued by the Government of the Republic of Lithuania and unavoidable fluctuations in the interest rate are caused, as well as the fact that the duration of liabilities assumed by insurance undertakings (15–20 years) do not correspond to the maturity of securities issued by the Government of the Republic of Lithuania (the longest of which is 11 years), the Insurance Supervisory Commission passed the resolution in September 2006, under which the MTIR calculation procedure was amended by changing the basis for the calculation from Lithuanian Government bonds to long-term bonds issued by the euro zone countries (based on the Eurostat official data).

As the yield on long-term bonds was calculated using the convergence criterion for EMU (monthly average of central government bond yield on the secondary market, gross of tax, with around 10 years' residual maturity), this method did not protect against the impact of the decrease of the interest rate but seems to solve the problem of scarce availability of long-term Lithuanian bonds and smoothes discount rate fluctuations between its recalculation periods. The methodology for discount rate calculation was though not changed significantly and 60% interest rate rule as 3.5% discount rate cap still apply.

6 illustrates the dynamics of MTIR calculated by ISC under the resolutions in force compared to the possible options: (1) if Lithuanian Government bonds were still used as calculation base for MTIR; and (2) if the switching to the euro area government

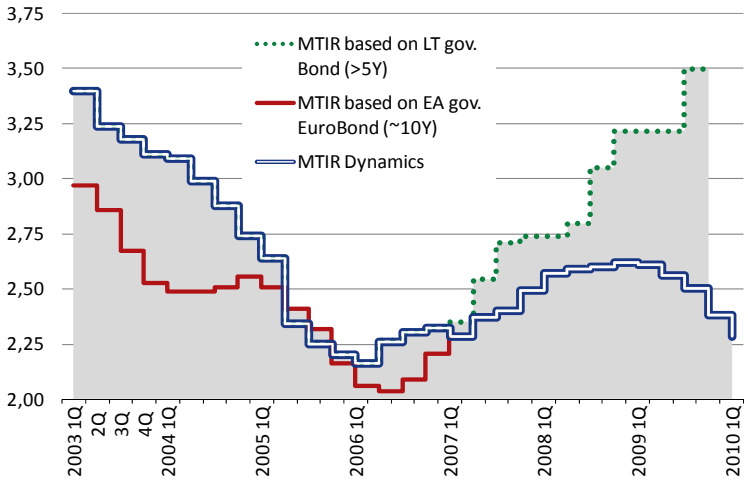

Figure 6. MTIR dynamics and the change of calculation methodology
Source: Bank of Lithuania, ISC, Eurostat, calculations by authors

bonds had been done earlier.

As seen in the chart, discount rate calculated using the Lithuanian Government bonds basis would be more volatile than using the euro zone government bonds. By eliminating the prudency margin (40%) included in this rate calculation and by projecting the rates in Solvency II environment, this deviation from the average rate would be even more significant. Therefore, the relevant risk-free interest rate term structure for insurance liabilities should not be based on Lithuanian bonds as it would not satisfy all the relevant qualities (in particular, realism, reliability and liquidity for all maturities) underlined in the CEIOPS (2009) advice.

A short-term solution in this situation could be to link the discount rate calculation to the yield on bonds issued by governments with AAA ratings, which can be considered to have no relevant credit

risk. As the euro zone has several AAA-rated governments, a risk-free government bond curve can be based on the euro curve derived by the European Central Bank. That would correspond to future Solvency II requirements and satisfy other necessary quality requirements, except the one for the relevant term structure. The only question that still rests in this situation is how to assure the term structure availability for all currencies in question in Solvency II environment, as there are no euro zone bonds denominated in LTL. Even though this question will not be so relevant if Lithuania keeps its Currency Board regime and fixed LTL–EUR exchange rate till the forecast introduction of EUR in 2014–2015.

Conclusions

I. The existing legal and regulatory requirements for choosing a discount rate are diverse and could create a significant gap between special purpose (Solvency II) and general purpose (IFRS 4, MCEV) financial reporting.

II. The structure of risk-free interest rate, which could be used for insurance liabilities valuation, cannot be based on the yield on Lithuanian Government bonds. This yield is not available for all maturities and at the moment is unavailable for longer that 10-year maturities. The yield for other maturities is not only very volatile in comparison with the yield on the euro zone bonds, but also much influenced by the development of market liquidity.

III. Following the advice of the CEIOPS, the instrument on which the relevant risk-free interest rate term structure is based should have seven necessary qualities. The Lithuanian bonds do not possess four of them. The possible alternative—using AAA-rated euro zone bonds—will be only a short term solution as the criteria regarding the availability in a relevant currency (LTL) will not be met. This shortcoming will cease to play a role after Lithuania joins the euro zone club, but that is not foreseen till at least 2014–2015.

IV. The calculation of the discount rate for insurance liabilities in Lithuania should be evaluated in Solvency II environment without the 60 per cent factor, as this factor cannot correctly capture credit risk elimination and could provoke a situation where the discount rates based on BBB-rated bond yield is lower than the yield on AAA-rated bonds, which is usually accepted as risk-free rate benchmark (Figure 6).

V. To move towards the fundamental reason, i.e. harmonization (the ability to compare diversified insurers' (active in several different markets) portfolios), it is desirable for all EU insurers to use the single and unified discount rate calculation methodology. This methodology could use deep and liquid (e.g. euro zone) market debt securities (high investment grade, e.g. AAA) yield structure without any adjustments against different currency of liabilities.

VI. Furthermore, although the insurance liabilities illiquidity in some cases demands the inclusion of liquidity premium above pure risk free rate, taking into account the fact that

- currently applied 60 per cent factor will no longer be applied within the new Solvency II regime,
- not all liabilities are illiquid and there is no reliable methods to measure the illiquidity of liabilities,
- the introduction of a liquidity premium for the valuation of illiquid liabilities will result in a new artificial mismatch for insurers, in whose investment portfolios no illiquid assets will be held for the coverage of the illiquid liabilities,

the authors of this article do not support the addition of the liquidity premium to the risk-free interest rate structure.

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DISKONTO NORMOS PARINKIMAS SIEKIANT ĮVERTINTI DRAUDIMO ĮSIPAREIGOJIMUS

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Santrauka. Draudimo rinka šiuo metu išgyvena dideles permainas. Pasirodžiusi nauja Mokumas II direktyva ir tarptautiniai finansinės atskaitomybės standartai jau artimiausiu metu reikalaus iš draudimo įmonių diskontuoti visus draudimo įsipareigojimus. Tačiau šiam diskontavimui įvykdyti turėtų būti naudojama pagrįsta diskonto norma, kurios nustatymas šiuo metu ir kelia sunkumų, nes mažesnėse šalyse, kurios neturi gerai išvystytos ir likvidžios skolos vertybinių popierių rinkos, nėra pakankamų rinkos duomenų tokiai diskonto normai įvertinti.

Šiame tyrime analizuojama Lietuvos rinka ir jos litais denominuotų vyriausybės obligacijų rinka, ieškoma būdų įveikti natūralias kliūtis, kurios atsiranda tokioje rinkoje ieškant ilgalaikiams draudimo įsipareigojimams vertinti tinkamos diskonto normos. Taip pat analizuojama dabartinė maksimalios techninės palūkanų normos nustatymo metodika ir jos galimi vystymo būdai, nerizikinės palūkanų normos įvertinimas pagal vyriausybės obligacijų pelningumą.

Darbe pateikiamos išvados apibrėžia pagrindines gaires, kuriomis vadovaujantis galėtų būti nustatoma draudimo įsipareigojimams vertinti taikytina diskonto norma pagal Mokumas II direktyvos reikalavimus. Autoriai daro išvadą, kad ateityje turėtų būti atsisakyta dabartinės praktikos mažinti diskonto normą, ją dauginant iš 60 procentų daugiklio, diskonto norma neturėtų būti nustatoma pagal mažai likvidžios ir visoms draudimo įsipareigojimų trukmėms nesančios Lietuvos vyriausybės obligacijų rinkos duomenis. Tam turėtų būti naudojami euro zonos valstybių obligacijų pelningumo duomenys, kurie neturėtų būti koreguojami prie pelningumo pridedant likvidumo premiją.

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