Quantification of the Impact of a Ban on the Use of Gender in Life Insurance

Kvantifikace dopadu regulace pohlaví v životním pojištění

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Abstract

The paper explains the impact of insurance regulation to the pricing after ban of using sex life tables. On 1st March 2011, the Court of Justice decided that it is not possible for pricing to use lifetables based on sex differentiation. There would be a contradiction with the Directive 2004/113/ES that sets a principle of equal treatment between men and women in the access to and supply of goods and services. This conclusion forced the insurers all over the Europe to create new prices and made an information asymmetry in favour of the clients. According to the theory, the market participants' behaviour in imperfect information leads to a creation of a new market equilibrium. In practice, it results into the product designs adjustments. The impact of regulation into the final price of insurance is quantified on the case of European insurers group. The other impact is the change in the structure of the insurance class in terms of representation of men and women in the new business.

Abstrakt

Tento příspěvek kvantifikuje dopad regulace pohlaví v životním pojištění na finální cenu pro zákazníka. Soudní dvůr EU 1. března 2011 rozhodl, že již nelze při cenotvorbě využívat podklady založené na rozlišování pohlaví, neboť by došlo k rozporu se směrnicí Rady 2004/113/ES, kterou se zavádí zásada rovného zacházení s muži a ženami v přístupu ke zboží a službám a jejich poskytování. Toto rozhodnutí donutilo životní pojistitele v celé Evropě k vytvoření nových sazebníků pojistného a informační asymetrie ve prospěch klientů. Chování tržních subjektů při informační asymetrii dle teorie vede k vytvoření nové rovnováhy na trhu. V praxi pak k úpravám produktových designů. Na příkladu 6 pojistitelů, jejichž tržní podíl představuje v současné době 62,2 %, je kvantifikován dopad regulace do výsledné ceny pojištění. Dalším dopadem je změna struktury pojistného kmene z hlediska zastoupení mužů a žen u nově sjednaných smluv.

Introduction

Life insurance fulfils several functions. From the client's perspective, the key function is financial help if a serious life risk occurs. This may be a dread disease, disability, accidental permanent consequences or in an extreme case even death. Further, life insurance may cover the temporary loss of income of the family's wage earner as well as credit and mortgage instalments. As for long-term savings, life insurance used to be the cornerstone of the private pension insurance scheme; this function is, however, only marginal in Central and Eastern Europe currently. Similarly, the macroeconomic role of life insurance companies must not be forgotten; this lies in a long-term accumulation of funds.

Life insurance regulation protects primarily the public interest. Daňhel (2006) identifies its main objective as the regulation of insurance companies' economic activities ensuring that insurers meet the terms and conditions entered into. Daňhel and Ducháčková (2010) also stress the importance of customer security, mainly ethical aspects of economic environment. On 1 January 2016, Directive 2009/138/EC (Solvency II) entered into force and being the main regulatory instrument to guarantee the stability of life insurance. Customer protection regulation proceeds from the premise that customers are the weaker party to the insurance policy. Therefore, only external state interventions can create the necessary market balance, which lies in transparency, simplicity, intelligibility and above all fairness of products.

The objective of this study is to demonstrate the impact of regulatory measures on both the market price and the customer. The theoretical grounding of this study is based on an overview of studies on this topic as well as on life insurance development. The main part quantifies the impact of already implemented laws against gender discrimination, which has been documented by the impact on life insurance product prices. The method used in the present study was the collection of market data; data from both public and state databases (Insurance Europe, Eurostat and the Czech Insurance Association) as well as data from price calculators of individual insurers were used. The study also contents data collected by the author during his cooperation with both the European and Czech Insurance Associations and last but not least data on which six insurers have based their pricing and which are published for the first time. The final part sums up the study and presents its conclusions.

1   Theoretical Background and Present Results of Empirical Research

Studies on the impact of the regulation providing for equal treatment between men and women on insurance have been published only rarely so far. In the German-speaking countries is analysis done by Eling and Kilgus (2014). In Central and Eastern Europe, these are mostly diploma theses; the individual effects of this regulation were most specifically quantified by Korejs (2016). His thesis is primarily based on legal analysis; however, it also includes conclusions regarding the impact of premium rates on family budgets. Taking unit-linked products as an example, the author calculated a 16% to 28% price growth for a couple. He also elaborates on insurance offer. Hřebačka (2015) focuses on

capital assurance products and analyses the regulation impact on technical provisions of insurance companies, using Ducháčková's (2009) methodology.

Among foreign studies, the prize-winning dissertation of Chan (2014) stands out; based on data from England and Wales, he demonstrates that gender is a significant parameter of the risk of death. He further elaborates on local risk margins and other alternative risk factors that might replace gender. He uses market data by Gerrard and Dheir (2013), who acquired them from Moneysupermarket.com. Premium rates decreased by up to 9% for male policies and grew by up to 18% for female policies. What is also interesting regarding the issues addressed by this study is that a month after the ban on the use of gender, 67% of British insurers experienced higher than expected share of male policies in new business and in June 2013, the share of male policies in new business reached even 80%. Cicuttin (2013) quantifies the impact of the ban to use gender in insurance on Italian market, focusing on the pension insurance product offered by Allianz Italia. The author concludes that for the age of entry of 60 years and the period insured of 10 years, pension insurance premiums will grow by 6.8% for male policies and decline by 5.4% for female policies. OXERA report (2011) presents estimates of the regulation's future impact on selected European motor insurance and whole life insurance markets. The report estimates the prices of the latter compared insurance product will fall by 11% and 4% for men and rise by 30% and 9% for women on the German and Italian markets, respectively. The report is based merely on pre-regulation market data acquired from on-line price calculators in individual countries and on the authors' qualified estimates of future developments. Among qualitative studies, the work of Schmeiser, Störmer and Wagner (2014) is to be mentioned, it analyses the perception of the impact of the regulation providing for equal treatment between men and women by customers from 5 European countries. The study is based on the analyses of data from a survey with 5,108 participants.

The most cited work on imperfect information is the study by Rothschild and Stiglitz (1976), which suggests that asymmetric information is to the benefit of customers and introduces the concept of two equilibria. The final equilibrium is called differentiation of policies. Follow-up studies suggest a different final market situation with no equilibrium at all. Buchmueller and DiNardo (2002) illustrate such market development with the example of low-risk customers. They conclude that by leaving the market, low-risk customers give momentum to an unfavourable premium collection, premium growth and market downturn. Some scholars, however, disagree with Rothschild and Stiglitz. Hoy (2005) argues that such a clear individual choice between two products must hardly be made in real life. Some scholars are of the opposite opinion as regards asymmetric information. In his published lecture, Daňhel (2002) observes that insurers may apply posterior probability of already incurred claims and the law of truly large numbers, which help to set premiums correctly. Therefore, he concludes that asymmetric information is to the benefit of insurers.

2   Life Insurance Development

According to Insurance Europe (2017), written premiums in life insurance amounted to EUR 696 billion in the European Union in 2016. EU life insurance density amounted to

EUR 1,159 in 2016. Traditional products with an 77% market share prevail over unit-linked products. Customers do not use unit-linked products to invest available funds but to cover risks. The average life insurance penetration decreased from 4.5% to 4.2% in 2016.

**Figure 1**: Written Premiums in the EU in 2004–2016 (in EUR mil.)
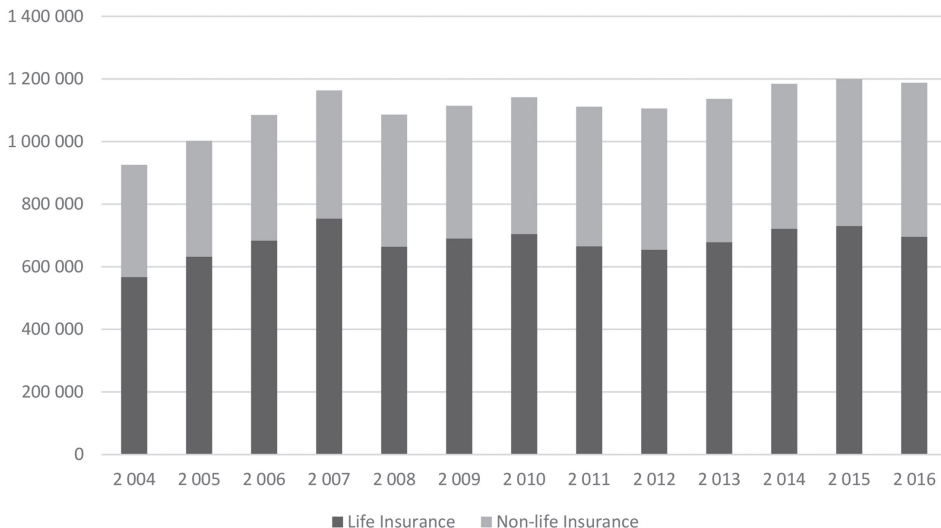
Source: Insurance Europe

Written premiums in life insurance amounted to CZK 43.7 billion (based on the methodology of ČAP, 2018) in the Czech Republic in 2017. Total insurance density reached EUR 479. The difference between this value and the European average can largely be attributed to the non-existence of a Czech health insurance market and naturally to a lower purchasing power of Czech customers. Unit-linked insurance is the major premium contributor in Central and Eastern Europe. It accounted for 51% of total premiums in the Czech Republic in 2016. The already well-established risk life insurance became even more popular in 2015 and started to take up the role of the up to then dominant unit-linked life insurance, which is nowadays also used primarily to cover biometric risks and not to create savings.

This change has been caused by several reasons; the key two factors being the following two. The first lies in the damaged reputation on the market, because most complaints about insurance products addressed to the Czech National Bank (ČNB) or the financial arbitrator concerned unit-linked life insurance in the past few years. Advisors and clients started to perceive a clear connection between mis-selling and unit-linked life insurance. The second reason is a growing number of statutory disclosures. Regulation (EU) No 1286/2014 (PRIIPs) has increased the number of disclosures by 27 compared to Solvency II. Directive (EU) 2016/97 (IDD), effective as of 1 Oct. 2018, will introduce further 36 disclosures related to the proper sale of capital assurance products. PRIIPs does not provide for term life insurance products; IDD provides for them only partly. What leads to an unnatural discrimination of certain products, is exactly this administrative burden specific only for selected insurance products. Paradoxically, such kind of market regulation may cause that customers choose a product, which is not optimal for them.

Figure 2 shows the development of written premiums, clearly indicating the not positive development in life insurance in the Czech Republic since 2011.

**Figure 2**: Written Premiums in the Czech Republic in 2011–2017 (in CZK mil.)
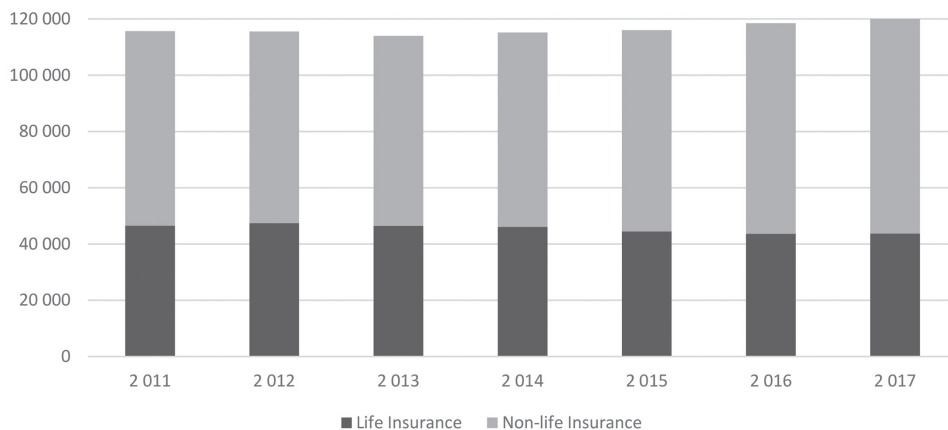
Source: Czech Insurance Association

3 Regulation Providing for Equal Treatment between Men and Women

3.1 Test Achat

There were three traditional risk-rating factors used in pricing insurance products. Brown (2004) considers age to be the most important factor influencing the insured amount. Further important factors are gender and whether the insured person is a smoker or a non-smoker. Actuaries used these key factors for dozens of years and it led to no differences between theory and practice. The differences between the mortality rates of men and women can easily be illustrated – see for instance the mortality tables published by the Czech Statistical Office or Figure 3. The primary genetic reason for different mortality rates in men and women is the human genetic make-up, where the XY pair of chromosomes goes through a number of biological processes in a different way, as is described e.g. Libert, Dejager and Pinheiro (2010).

Figure 3: Differences between Male and Female Life Expectancy in Europe in 2015 (years)
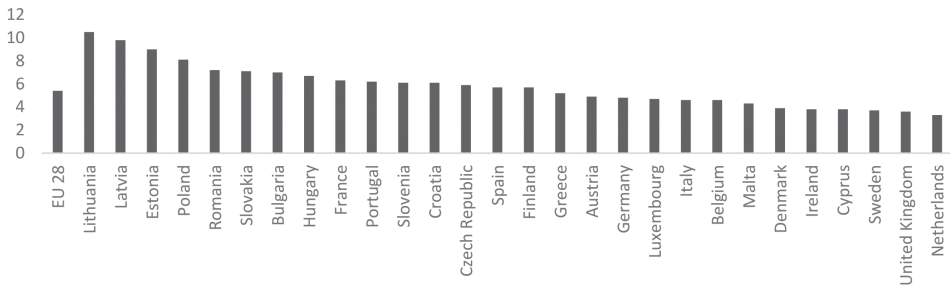
Source: Eurostat, author

As its name implies, Council Directive 2004/113/EC of 13 December 2004 implementing the principle of equal treatment between men and women in the access to and supply of goods and services stipulates uniform rates for men and women also in insurance, i.e. for policies entered into in the European Union after 21 July 2007. Article 5(2), however, gives the Member States the opportunity to permit differences in individuals' premiums between men and women also after this date if these are "based on relevant and accurate actuarial and statistical data".

Belgium was among the first Member States to adopt an act transposing this Directive and specifying Article 5(2). This act was opposed by Association belge des Consommateurs Test-Achats, Belgian non-profit organisation, and Mr. Bugt and Mr. Masselier because they suspected the act was contrary to Article 5(2). First, the case Test-Achats ASBL v Conseil des Ministres was heard in a court in Belgium. Later, it was heard in the European Court of Justice (ECJ). Following the opinion of Advocate General Kokott, the ECJ decided that this Article be viewed in the light of the EU Charter of Fundamental Rights, which prohibits any discrimination on grounds of sex. Similarly, the ECJ referred to Article 19(1) of the Treaty on European Union. The ECJ did not accept the argument that the respective paragraph is not incompatible with the above documents; on the contrary, the Court is concerned that the then applicable conditions might be applied forever. It was the permanent applicability that was contradictory to the objectives of Council Directive 2004/113/EC. This resulted in the ruling that Article 5(2) exemption shall be removed after the five-year period, i.e. as of 21 Dec. 2012. The ruling was made on 1 March 2011. Even though experts knew about the pending case, the final ruling was a surprise.

3.2 Rothschild-Stiglitz Model

The ban on the use sex for pricing is a classic example of regulation leading to imperfect information on the market. This situation is addressed by the economic model developed by Rothschild and Stiglitz (1976). Using the example of insurance market, the authors proved that even few imperfect information can have a substantial impact on market balance.

The model is based on 4 assumptions. The first assumption is based on a well-organised competitive market, where the authors conclude that insurers expect zero profits and are risk-neutral. If an insurance company generated profits, its competitors would copy its products. The second assumption is that there are two different groups of customers – low-risk individuals with accident probability p^L and high-risk individuals with accident probability s $p^H > p^L$. The fraction of high-risk customers is λ, so the average accident probability is:

$$\bar{p}=\lambda p^H+(1-\lambda)p^L. \tag{1}$$

The third assumption is that all insurers consider the steps of their competitors as given. Based on this assumption, the authors conclude there is an equilibrium because no insurance company is motivated to deviate from its original strategy, since it knows the steps of its competitors. The last assumption is most important; namely, asymmetric information is to the benefit of customers, since an insurance company does not know accident probabilities of its customers. Customers, however, know their accident probabilities perfectly.

The demand of individual customers for insurance is determined by the maximization of their expected money income:

$$\hat{V}(p,W_1,W_2)=(1-p)\mathrm{U}(W_1)+p\mathrm{U}(W_2), \tag{2}$$

where p = probability of a claim (an accident),
W_1 = income if there is no accident,
W_2 = income if an accident occurs,
U   = utility of money income.

Customers are assumed to be risk-averse U' < 0, therefore indifference curves are convex.

Under the above assumptions on income maximization and risk neutrality, the supply is determined by expected incomes from the policy:

$$\pi(p,\alpha)=(1-p)\alpha_1-p\alpha_2, \ \ (3) \tag{3}$$

where α_1 = premium,
α_2 = insurance benefit.

Based on the described assumptions, the authors defined two market equilibria. First is the so-called pooling equilibrium, where insurance companies determine both the premium rates and volume of sold policies (unlike to the well-organised market environment). The authors prove that this equilibrium may never occur, since low-risk customers overpay their insurance cover; therefore, competitors would launch a cheaper product to take over these customers. This would cause lowering the premiums on the market up to under the amount defined by the demand (3). From a long-term perspective, this in not sustainable, therefore there cannot be pooling equilibrium. An alternative equilibrium is the so-called separating equilibrium. A single price is replaced by the activities of a less-informed

stakeholder (screening), who tries to identify different customer types by offering various product designs, while maximizing the utility and profitability.

3.3   Impact on the Insurance Market

Insurers are concerned about two issues in such imperfect information market:
1) Shall a risk margin be implemented and if so, in what amount?
2) Will the ratio of male and female policies in the portfolio be the same after the regulation as it was before?

The concrete impact of the regulation on premiums paid by customers can be determined by actuarial calculations. The actuarial present value of whole life insurance is:

$$A_x = \sum_{k=0}^{\infty} {}_k p_x \, q_{x+k} v^{k+1}, \qquad (4)$$

where ${}_k p_x$ = probability that man at the age of x will live k years,
q_{x+k} = probability the insured dies at the age of x+k,
v^{k+1} = discount factor.

Present value of temporary life insurance due equals:

$$A^1_{x\overline{n}|} = \sum_{k=0}^{n-1} {}_k p_x \, q_{x+k} v^{k+1}. \qquad (5)$$

Present value of temporary annuity due equals:

$$\ddot{a}_{x\overline{n}|} = \sum_{k=0}^{n-1} {}_k p_x \, v^{k}. \qquad (6)$$

Regular net premium in temporary life insurance due:

$$P_{x\overline{n}|} = \frac{A^1_{x\overline{n}|}}{\ddot{a}_{x\overline{n}|}}. \qquad (7)$$

The change discussed in this study influences formula (7) due to a change of the applied probability of death at the age of x in formula (4) by introducing new probability of death at the age of x for men and women:

$$q_x^{unisex} = k q_x^M + (1-k) q_x^F, \qquad (8)$$

where k = weight of male gender incl. risk margin,
q_x^M = probability that man at the age of x will die within 1 year,
q_x^F = probability that woman at the age of x will die within 1 year.

Formula (8) represents the key relation that every European insurance company had to solve. There was uncertainty as to the value of *k*. There were even extreme approaches suggested before the regulation. An example might be Česká podnikatelská pojišťovna, from the Vienna Insurance Group; it considered the introduction of a very high risk margin, *k = 100*, as Korejs (2016) describes. From the perspective of risk management and risk

business mix, this would be a risk-free solution. The competitiveness of the insurance company would though be limited, on the other hand. A simplified approach with $k = 50$ is not correct either, since this value dos not correspond to the real distribution of female and male policies in the portfolio and moreover. The Czech Actuarial Society was the first to publish expert recommendation ČSpA No. 2 (2012). Appendix 1 states the estimated future ratio of male vs female policies (business mix) is 60/40 to 65/35; the Society recommends to apply an additional risk margin, which would adjust the male vs. female policy ratio to 70/30.

It is fair to set the value of k based on the real male to female policy ratio in the portfolio as shows the figure 4.

Figure 4: Share of Male and Female Policies before and after the Regulation Based on Individual Age Groups (%)

man until 2012   man in 2013   man since 2013   woman until 2012   woman in 2013   woman since 2013
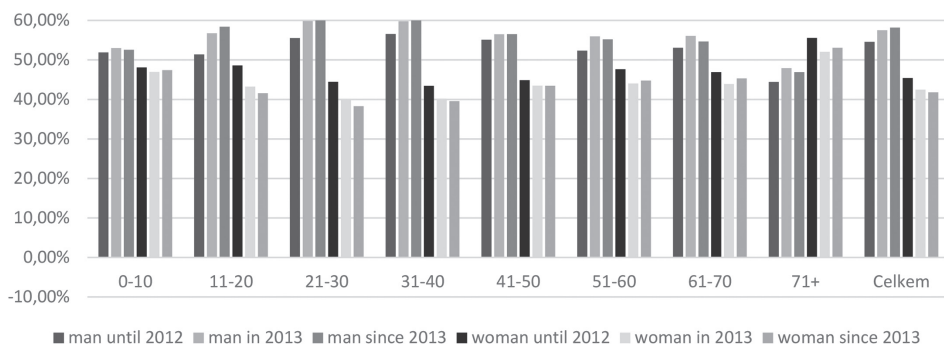
Source: author

The share of male policies in the portfolio until 2012 is amounted to 54.6% in total. The highest male policy share, namely 56.6% (ages of 31–40). The second above question is concerned about the business mix ratio stability. First, the change was announced 22 months prior to its legal force. During this period, most insurers tried to target women by their marketing campaigns. Second, after the regulation, above all external independent brokers were expected to use unisex pricing as a reason to visit their male clients and advise them to terminate the old and enter into new unisex policies.

From the above follows that question No. 1 is relevant; now, the amount of risk margin is to be determined not the question if it will be implied or not. The amount of risk margin depended on risk aversion of individual insurers. The decision on increasing risk margin was influenced by the concern that men would terminate their current policies. On the other hand, concerns about the competitiveness of new unisex rates led to setting a minimum risk margin. Moreover, since massive policy termination and conclusion of new unisex policies was expected, the managements of insurance companies wished to offer attractive new premium rates. An example may be certain European subsidiaries of the Dutch insurance group Aegon that introduced new unisex premium rates besides the present male and female premium rates as of 1 September 2012 already.

Table 1 gives the values of *k* for selected insurers on the market. These are both subsidiaries of global insurers (Allianz, Aegon, Generali) and an insurance group operating in Central and Eastern Europe (VIG). Acquiring the data and their verification with the responsible staff of individual insurance companies as well as the publishing of the values of k is unique, since the impact of the above regulation can be first quantified in such scope thanks to these. From the table is clear that the precautionary principle prevailed on the market. Figure 4 and columns "man since 2013" and "woman since 2013" suggest that the ratio of men vs women changed to the present value k2018. The real risk margin of insurers is listed in the last columns Table 1, where:

$$b = k_{ins} - k_{2018}, \tag{9}$$

Table 1: Weights of Male Probability of Dying

Insurance company	k_{ins}	B
Aegon	0,70	0,118
Allianz	0,70	0,118
Česká pojišťovna	0,70	0,118
Česká podnikatelská pojišťovna	0,66	0,078
Kooperativa	0,25[1]	n.a.
Pojišťovna České spořitelny	0,70	0,118

Source: author's enquiries responded by the listed insurance companies

When the weight of *k* and the given actuarial relationships (4) to (8) are determined, it is easy to determine the price impact on customers too. Unit-linked insurance has the most significant explanatory power with respect to the quantification of the ban on the use of gender in insurance, since it was the prevailing life insurance product then. Besides the calculation of net premium (7), we therefore need to know the fund value at the end of period insured too, with the same effective interest rate for all competitors. The fund value at the end of period insured Ft is defined by the following recurrent relation (Poul, 2003):

$$F_t = F_{t-1} + P_{t-1} - PF_{t-1} - L_{t-1} - R_{t-1} + G_t - MF_t, \tag{10}$$

where P_{t-1} = advance premium
PF_{t-1} = fixed administrative fee deducted at the beginning of period insured,
L_{t-1} = levy fee deducted at the beginning of period insured,
R_{t-1} = risk premium deducted at the beginning of period insured,
G_t = profit grow attributed from the fund at the end of period insured,
MF_t = administrative charge deducted at the end of period insured

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1   *Kooperativa pojišťovna, a.s., Vienna Insurance Group did not apply a single value in percent for all age groups, instead it used different values for different age groups; the objective was obviously to use an upgraded product to enhance competitiveness. We therefore used the average value of k for all ages.*

There is a methodological advantage of comparing the fund value at the end of period insured, since we do not compare merely the probability of dying for one issue age x but for number n of issue ages. The change of the resulting fund value is thus enough representative provided that the same rate of interest, representing n values is used for all insurers.

4   Regulation Impact Quantification

Theoretically, the fund value at the end of period insured can be modelled as well (Poul, 2003), but if we do not have all data used for the calculation by individual insurers, we can obtain exact values only from modelling software of the insurers before and after the regulation. Table 2 gives the impact of unisex premium rates on the fund value of the customer with the rate of interest of 2.4%, taking as example a 35-year-old man with life insurance policy, the insured period being $n = 30$, the insured sum amounting to CZK 1,000,000 and monthly premium to CZK 1,200.

Table 2: Customer Endowment Fund Value before and after the Regulation

Insurance company	Woman before regulation	Man before regulation	Unisex after regulation	Unisex based on the state in 2012	Relative difference
(1)	(2)	(3)	(4)	(5)	$(6) = \dfrac{(4) - (5)}{(5)}$
Aegon – VIA	CZK 431,949	CZK 276,770	CZK 326,549	CZK 347,221	−6,0%
Allianz – Rytmus/ Mercury	CZK 453,251	CZK 270,963	CZK 325,513	CZK 353,722	−8,0%
Česká podnikatelská pojišťovna – Evoluce	CZK 428,758	CZK 266,281	CZK 326,549	CZK 340,046	−4,0%
Česká pojišťovna – Diamant	CZK 303,587	CZK 99,610[2]	CZK 116,378	CZK 192,216	−39,5%
Kooperativa – PERSPEKTIVA	CZK 391,672	CZK 190,139	CZK 264,083	CZK 281,635	−6,2%
Pojišťovna České spořitelny – Flexi	CZK 405,414	CZK 293,238	CZK 341,555	CZK 344,166	−0,8%

Source: modelling software of insurance undertakings, author

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2   *The premium had to be increased to CZK 1,321 so that the sufficiency of premium is reached.*

Columns (2), (3) and (4) give the endowment fund values calculated by the modelling software of individual insurers and the compared products. Column (5) uses unisex rates for the original value of $k_{2012} = 0.546$, which is the value based on Figure 4 in the portfolio until 2012. Column (6) indicates the change of the fund value and this difference represents the impact of regulation on customers, i.e. the use of risk margin.

From column (6) of Table 2 is clear that in all insurance companies the endowment fund value has decreased. The arithmetic average of the selected insurers amounts to −10.7%. The weighted average, where the then market shares are used as weights, amounts to −18.3%. Figure 4 indicates that the assumptions about the change of the ratio of male vs female policies in the portfolio were correct; however, they were not so significant so that they could compensate the set risk margin. In 2018, the share of men in the portfolio accounted for $k_{2018} = 0.582$. The results based on this value are listed in Table 3. The weighted average decrease of the endowment fund value based on the present market shares amounted to −9.8%.

Table 3: Impact of the Regulation on the Customer Endowment Fund Value

Insurance company	Unisex after regulation	Unisex based on the state in 2018	Relative difference	Market share of insurers as of 30 Sept. 2017
(1)	(4)	(7)	$(8) = \dfrac{(4) - (7)}{(7)}$	(9)
Aegon – VIA	CZK 326,549	CZK 338,580	−3.6 %	2.9 %
Allianz – Rytmus/ Mercury	CZK 325,513	CZK 341,930	−4.8 %	6.4 %
Česká podnikatelská pojišťovna – Evoluce	CZK 326,549	CZK 334,404	−2.3 %	4.3 %
Česká pojišťovna – Diamant	CZK 116,378	CZK 160,515	−27.5 %	18.1 %
Kooperativa – PERSPEKTIVA	CZK 264,083	CZK 274,298	−3.7 %	15.5 %
Pojišťovna České spořitelny – Flexi	CZK 341,555	CZK 343,075	−0.4 %	15.2 %

Source: author, column (9) ČAP

The EU market has experienced further changes besides the unnecessary risk margin increase as well. The first one has affected prices again. In case of annuity products, longevity risk represents a significant source of potential loss of insurance companies presently; therefore k was set to zero in most cases. This is the maximum possible price growth unless fully new q_x^{unisex} are assumed. On the contrary, for example for juvenile life insurance in some cases $k = 100$, with the same objective.

A further market change does not lie in price increase but in reducing supply. A vast majority of European insurance companies reduced its product portfolio, since they were not willing to bear the costs of the change implementation for all the products they offered. Supply may be reduced in two ways. First, the sale of insurance products may be suspended. Second, amendments to already concluded policies may not be accepted. Any supply or diversity reduction on the market leads to a lower chance to meet the needs of customers.

Kooperativa was the only important player on the Czech market that concentrated on a detailed solution to unisex rates, with the exception of individual issue age groups. Other insurance companies used the same value of k with regard to cost optimization. Figure 4 shows this is not an optimal solution, since regulation affected individual age groups differently. The volume of male policies grew by only 2.5% for the ages between 41 and 50. European regulation has thus only caused another market distortion. The managements of business corporations have to act in the defeasible interest of the corporations and maximise their profits. A single value of k was therefore used, since the benefit of minimising the costs of regulation implementation on the supply side prevailed upon the benefit of an optimal solution from the customers' perspective.

Let us look at the above model of Rothschild and Stiglitz again. The implementation of unisex rates made European insurance companies view men as high-risk and women as low-risk customers when pricing whole life insurance. Customers exactly know to which group they belong, and asymmetric information is therefore to their benefit. In this case, paradoxically, insurance intermediaries and insurance companies know the sex of the person to be insured! They are only not allowed to use the information when pricing and decision making. Follow-up studies further elaborate on this model but its conclusion, namely the impact on product design, has remained valid. In practice, insurance companies have adjusted and modified their risk underwriting.

The theory about the identification of high- and low-risk individuals by various product designs, as presumed by the model, can be verified in practice when looking at the insurance market. Most often, insurance product managers create two different designs of dread disease cover policies that differ by the list of covered risks. Besides the usual risks, female policies cover female cancers or complications during delivery; male policies are designed similarly[3]. Each of the products has its own price. Both products are offered to all customers by the insurers so that Council Directive 2004/113/EC is adhered to. A general design of the product is the third option. The successful sale of such gender-specific products has proven that customers can identify which product design is suitable for them thanks to these gender-specific risks and the insurers are able to eliminate the business mix impact.

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3   E.g. the product Diagnose Leben! by Würzburger Versinerungs AG (ABK rate (2016), the product PRO ŽENY (FOR WOMEN) by Allianz (Special Terms and Conditions for the Insurance of Individuals Rytmus risk (RP1) and rate NM22 PRO ženy), life insurance For You by NN Životní pojišťovna (Special Terms and Conditions for Breast Cancer and Female Reproductive System Cancer Rider CFR1) or products Pojištění maminka (Mum Insurance) and Pojištění tatínek (Dad Insurance) by ČSOB pojišťovna (Special Terms and Conditions ZENY 09/2015 and Special Terms and Conditions MUZI 09/2015).

A further effect of the regulation prohibiting the use of gender in pricing might be a decrease in demand for life insurance in the Czech Republic. For the above described reasons, demand of women for life insurance has dropped, as illustrated by Figure 4. On the other hand, demand of men for life insurance has grown. However, it has not compensated the drop of women demand. By affecting prices and business mix, the regulation caused market imbalance; the market is now not perfectly competitive in terms of economic theory, since it has experienced a fall in demand for life insurance and a deviation from the balance that can be reached in a competitive market. Between 2012 and 2017, the life insurance market experienced a drop annually as illustrated by Figure 2, where the total decrease reached 8% in this period. Since not even expert studies have proven the reason for this drop sufficiently and if it was caused only by the regulation (Šindelář, 2016), it can only be concluded that the trend reversal in the Czech Republic exactly corresponds to the regulation implementation. Figure 1 clearly shows that the same conclusion cannot be made for the European market either. The markets in the United Kingdom, France, Germany and Italy account for 70% of the European market. The market growth in the UK and Germany after 2012 was caused by single paid insurance products. France experienced price competition among insurers and other financial institutions that ended after two years of market downturn (−13% in 2011 and −8% in 2012) and the market started to recover gradually from 2013 on. The Czech market did not experience such fundamental changes in the respective period.

Conclusion

The study discussed the impact of the European regulatory intervention on the life insurance market balance. Life insurance is irreplaceable in highly developed economies, which substantially contribute to long-term market balance thanks to the elimination of the negative impact of contingency, and therefore any imbalance is undesirable. The insurance market analysis was based on local branches of global and European insurance companies and their products that presently account for 62.2% of the Czech insurance market. Both big insurance market players and several smaller companies were included in the study. The study compared whole life products and 30 age groups. This study is unique thanks to the data on pricing acquired by the author. Calculations have proven the regulation impact on the average weighted endowment fund value of UL products. Premium growth reduced this value by −9.8%. Market shares were used as weights. Price growth has been caused mainly by the precautions of the insurers, who only estimated the future gender business mix. They thus applied risk margins on pricing in accordance with the required precautionary principle. The estimates of international insurance companies on the Czech market proved to be overestimated, and the market therefore experienced a price growth of whole life insurance industry. The study further concludes that the regulation led to a change of the ratio of male and female customers. The share of male policies increased by 6.6% after the regulation. A new market balance has thus been artificially created, which is under the previous balance from the life insurance demand perspective. Regrettably, the described market change did not result from a natural behaviour of market participants but from an artificial market interference by regulation.

Further discrimination bans are presently being discussed in the European Union. First, let us mention the factor of health and age. Age is the most crucial risk factor in pricing. A potential prohibition to use age for pricing could lead to a price spiral and market downturn. Theoretically, the market would be attractive only for elderly customers. Thanks to the present knowledge of the quantification of the gender discrimination prohibition impact, individual effects can be used as a strong argument against a potential European Union ban of discrimination on the grounds of age or health.

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