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EUGENIUSZ KOWALEWSKI
EWA BAGIŃSKA

The process of modernisation of Polish insurance law – a critical analysis

The article surveys the reforms that took place in the Polish insurance law in the years 1990–2007. The assessment of the 2003 legal acts, commonly called the Insurance Act package, makes up the main body of the analysis. The said laws have provided a firm foundation for the development of private insurance; nevertheless, some measures had substantial flaws. The authors critically assess some minor amendments to the Civil Code (2003) and the 2007 grand reform of insurance contract law.

Keywords: insurance legislation, insurance reform, Poland.

Introduction

A legislative reform of private insurance is a difficult and complex process. Private insurance law is part of a comprehensive body of laws that regulates a very complicated and extensive area. This area consists of civil-law insurance relations (laid down in the Civil Code (hereinafter referred to as “CC”) and the Maritime Code (hereinafter referred to as “MC”)), issues concerning the provisions of administrative and financial law applicable to insurance and all organisational matters. Criminal laws involving insurance, insurance accounting, insurance mediation and other areas of state control (procedural aspects, issues relating to labour legislation and tax law) should also be mentioned. It would be an anachronism to regulate all these various matters in a single enactment, might it be the most extensive and well-thought piece of legislation.

For all these reasons, after 1990 there was a demand in Poland for a new private insurance law regulation. The pre-1990 laws needed to be restructured and adapted to new economic conditions, which required securing the optimal legislative framework.¹ The concept of an insurance code,

1. J. Łopuski and E. Kowalewski, “Założenia legislacyjne dalszej reformy prawa ubezpieczeniowego,” *Państwo i Prawo* 11 (1991): 5–18. J. Łopuski, “Nowe prawo ubezpieczeniowe a ubezpieczenia morskie: refleksje na temat kierunków rozwoju prawa ubezpieczeniowego,” *Prawo Asekuracyjne* 3 (2004): 5–25.

which would consolidate the statutory autonomy of insurance law and bring together disperse regulations on insurance relations into one act, has not been accepted.² In practice, the concept of partial regulation was carried out in the 1960s, when the CC and the first MC came into effect. It came down to the distinction between the civil insurance law (insurance policy regulations) and administrative, financial and organisational aspects of private insurance services. While the civil law part was to be regulated by the code (the CC and the MC), other issues were to be covered by “insurance acts”³ In practice, however, the latter interfered with civil law issues. Under the Insurance Activity Act of 28 July 1990 an incoherent regulation of the insurance policy caused considerable normative chaos, especially in the field of compulsory insurance.⁴

For these reasons, the legislative concept formulated by J. Łopuski and E. Kowalewski⁵ in the early 1990s has begun to gain increasingly wider recognition amongst insurance practitioners and members of relevant legislative committees. The need for drawing up the “Insurance Act package” covering insurance activity and insurance supervision, insurance agency, compulsory insurance and many other issues, was one of the objectives underlying this concept. It did not specify which legal instruments were to contain provisions governing insurance policies (the CC and the MC, or a separate act on insurance policies). However, the concept emphasized the necessity for a reform of civil insurance law, coupled with the introduction of the package solution.

I. The modernisation of the private insurance regulation

1. The legislative concept of reforms

On 22 May 2003, the Parliament passed four acts⁶ regulating private insurance law: the Insurance Activity Act, the Act on Compulsory Insurance, the Insurance Guarantee Fund and the Polish Motor Insurers’ Bureau, the Act on Insurance and Pension Supervision and on the Insurance Ombudsman, and the Insurance Mediation Act.

These acts, commonly called the Insurance Act Package, provide a firm foundation for the new legislative framework of private insurance. Their enactment constitutes the most comprehensive and largest reform of this branch of law in the history of Polish legislation. In its wake, Polish standards and measures have been adjusted to the European Union law. This, in turn, resulted in the domestic insurance market effectively becoming part of the single European market.

2. E. Kowalewski, “Propozycje zmian w ustawie o ubezpieczeniach majątkowych i osobowych,” *Studia Ubezpieczeniowe* XI (1989): 191–192.

3. In particular, the Property and Personal Insurance Act of 2 December 1958 (Journal of Laws. No. 72, item 357; amendments in Journal of Laws: Journal of Laws No. 16, 1964, item 94) and the Property and Personal Insurance Act of 29 September 1984 (Journal of Laws. No. 45, item 245, amendments in: Journal of Laws. 1989, No. 39, item 160).

4. Consolidated text in the Journal of Laws of 1996, No. 11, item 62 as amended. The Act had twenty amendments until the uniform text was introduced.

5. J. Łopuski and E. Kowalewski, “Założenia,” 5 et seq.

6. Journal of Laws, No. 124, items 1151–1154. The Acts came into effect on 1 January 2004, but some of the regulations came into effect on the day when Poland became a member of the European Union, that is on 1 May 2004.

Nevertheless, most of the secondary legislation instruments enacted under the acts were drafted and published too late (from 1 January 2004 onwards), which turned out to be a considerable inconvenience in the effective introduction of the new insurance acts.⁷

2. The Insurance Activity Act

The Insurance Activity Act is an extensive legislative enactment that contains regulations on undertaking and stimulating personal and property insurance activities. It also lays down the rules governing the insurance self-regulatory body and insurance supervision.⁸ However, issues pertaining to the organisational framework of insurance supervision, the functioning of the Insurance Ombudsman office, insurance mediation, compulsory insurance and the related institutions, including an Insurer's Claims Representative, the Insurance Guarantee Fund (*Ubezpieczeniowy Fundusz Gwarancyjny, UFG*) and the Polish Motor Insurers' Bureau (*Polskie Biuro Ubezpieczycieli Komunikacyjnych, PBUK*) fall outside the scope of this Act. Hence, it can be concluded that the Insurance Activity Act and other enactments contained in the "Insurance Act package" constitute a moderately comprehensive regulation of private insurance, with the exception of insurance contract regulation⁹ and some other specific regulations¹⁰.

A comparison of the Insurance Activity Act with other acts included in the Insurance Act package shows the distinctive nature of the former. Despite the fact that the Act is not superior to other insurance acts,¹¹ there is no doubt that it reveals the distinct features of the "leading act". Not only does it embrace almost the entire regulation on "political" issues that are involved in insurance activity, but it also covers some general issues concerning the whole insurance sector. To give an example, it describes the general "claim settlement process", clarifies general notions (including those related to an insurance policy)¹² and regulates the confidentiality of insurance information. Likewise, the Act defines and explains the essence of insurance activity, provides interpretation of general conditions of insurance (hereinafter referred to as "OWU", *ogólne warunki ubezpieczenia*) (see article 12 (3)(4)), governs risk evaluation, specifies the rules of premium calculation and etc. It is easily visible that these issues are also relevant in the field of compulsory insurance and insurance mediation activities.¹³

7. See e.g. Journal of Laws of 30 December 2003, No. 228, items 2264–2269, which was published in mid-January 2004.

8. The regulations on insurance supervision rules (the Insurance Activity Act) and the structure of the supervisory body (The Act on Insurance and Pension Supervision and on the Insurance Ombudsman) were divided among different legal acts, which was unjustified and violated the principle of clear division of the subject matter of regulations.

9. They are included in the CC (articles 805–834) and the MC (article 292–338).

10. In particular, issues related to "export insurance", guaranteed by the State Treasury (the Act of 7 July 1994, uniform text in Journal of Laws of 2001 No. 59, item 609).

11. The legislation governing constitutional hierarchy of laws state that all "ordinary acts" have the same force of law. Z. Witkowski in: "Prawo konstytucyjne," (Toruń, 2000), 69.

12. See article 2 of the Act.

13. The claim settlement process concerns e.g. compulsory insurance (with some special regulations – see article 14 of the Compulsory Insurance Act), and insurance agents are also obliged to respect the confidentiality obligation relating to insurance information (article 13 (1) (3) and article 26 (1) (3) of the Insurance Mediation Act).

The exclusion of civil law aspects and their transfer to the CC is one of the most significant achievements of the Insurance Activity Act.¹⁴ The previously binding Insurance Activity Act included quite important civil law regulations, which infringed the fundamental distinction between matters regulated by either private or public insurance law and caused certain misunderstandings and interpretative difficulties.¹⁵ On the other hand, it should be stressed that the demand for a transfer of civil law regulations on insurance contract to the CC was not carried out consistently. Some civil law provisions were still included in the Act¹⁶ and, what is worse, they caused confusion bordering on chaos in the area of insurance contract regulations. This type of excessive interference with the CC cohesion was subjected to criticism.¹⁷

The Act under discussion introduced a clear set of notions, definitions and terminology. Those are generally precise notions of parties to an insurance contract and persons entitled under an insurance contract. Unfortunately, imprecise or even incorrect terminology can be found there as well. It can be said that the Act mentioned above is a pretty substantial achievement, albeit not without its share of semantic shortcomings.

Noteworthy are also the provisions concerning the regulatory framework and the functioning of an insurance company as a public liability company limited by shares (articles 31–37) and a mutual insurance company (hereinafter referred to as “Tuw”, *towarzystwo ubezpieczeń wzajemnych*) (articles 38–91)¹⁸, their finance management and reporting.

There are, however, a few inaccuracies in the Act that may have influenced the functioning of the Polish insurance market since Poland became a member of the European Union. For instance, certain provisions of chapter 6 (The carrying out of insurance business in Poland by foreign insurance companies – articles 103–126) are not completely consistent with some regulations of chapter 7 (Freedom of insurance services – articles 127–145).¹⁹

Quite significantly, the Act strengthens the policyholders' protection (and the protection of other persons entitled under an insurance policy) and extends their rights.²⁰ The effect of this are far-reaching obligations and duties of insurance companies. Strict legal requirements are imposed on insurance companies after the occurrence of an insurance accident. Insurers seem to struggle to meet all their

14. E. Kowalewski and A. Wąsiewicz, “Założenia legislacyjne reformy prawa ubezpieczeń gospodarczych,” (Toruń, Poznań, 1997) and A. Wąsiewicz, “Koncepcja legislacyjnej przebudowy systemu prawa ubezpieczeń gospodarczych,” *Prawo Asekuracyjne* 3 (1997): 3–26. The legislative objectives declared that transferring of the civil law provisions on the insurance policy to the CC was one of the main aims of the insurance law reform.

15. They involved e.g. the insurance company's obligation to deliver OWU to the policyholder. This matter was regulated in articles 385 and 812 of the CC and article 6 (5) of the Insurance Activity Act of 1990.

16. Article 12 (3)–(4) states that there is an obligation to formulate OWU (also in respect of an insurance policy) in an unambiguous and clear way, and that the *contra proferentem* rule applies. Similar rules can be found in article 385 (2) of the CC, but this regulation concerns only consumer contracts. However, since the Insurance Activity Act introduced a new rule to the CC (article 384 (5)), stipulating that provisions of the CC are applied to all insurance policies, the repetition of these provisions in article 12 (3–4) was unnecessary.

17. These changes violate and weaken the “leading function” of the CC – see E. Łętowska, “Kształtowanie się odrębności obrotu mieszanego,” in: *Tendencje rozwoju prawa cywilnego*, (Wrocław 1983), 432.

18. The content of the regulation is very extensive and it introduces several new arrangements including the possibility of issuing to Tuw a promise of permission to conduct insurance business (article 96) and transformation of Tuw into the insurance joint-stock company (articles 48–9), T. Sangowski, *Prawne i ekonomiczne uwarunkowania rozwoju towarzystw wzajemnych w Polsce* (Poznań: Wydawnictwo Akademii Ekonomicznej w Poznaniu).

19. E. Kowalewski and T. Sangowski, “Prawo ubezpieczeń,” 129–147.

20. E.g. the right to information (see article 16 (4) and article 25 (3)).

responsibilities. Hence, concerns are expressed that they may attempt to evade some of their duties²¹ or fulfil them only formally²² to the detriment of both insurers and the insured. The special protection of the consumer results from many other regulations (e.g. those concerning the supervisory body, the Insurance Ombudsman, the insurance company's solvency or regulations on merger of insurance companies, transfer of insurance policies, reorganisation proceedings or bankruptcy of insurance companies²³).

The Act presents an ambitious task of adjusting its regulations to the European Union standards, and especially to the Directives on the taking-up and pursuit of the business of insurance, freedom of insurance services, the insurance supervision, the reorganisation and winding-up of insurance undertakings and other issues. Furthermore, individual provisions and terminology of the Act are adjusted to norms included in other domestic statutory acts.²⁴

3. Act on Compulsory Insurance, the Insurance Guarantee Fund and the Polish Motor Insurers' Bureau

The Act on Compulsory Insurance, the Insurance Guarantee Fund and the Polish Motor Insurers' Bureau, known as the Compulsory Insurance Act, constitutes a novelty. For the first time in the history of Polish insurance legislation, compulsory insurance became the subject of a statutory framework established in the name of the "legislative purity", and – above all – implementing the constitutional rule which provides that significant and universally applicable rules and obligations imposed on individuals and parties to legal transactions must have a statutory footing and cannot be introduced by secondary legislation, and especially by regulations issued by various government departments.²⁵

The law preserves the rule that insurance protection may only be established on the basis of a civil law contract – concluded previously by the parties. In legal academic writings, this rule is known as "the contractual private insurance formula"²⁶. It dispels any doubts about the legal nature of the insurance relation, whose character – even in the case of compulsory insurance – is civil.²⁷

21. E.g. the obligation to provide OWU to the policyholder before the policy is concluded (see article 812 (1), and article 233 (3) of the Insurance Activity Act).

22. It may happen in the case of making the information and documents concerning the damage available to the insured (article 16 (4) and article 25 (3)).

23. Although the separate title of the act of 28 February 2003 has been devoted to the last issue (i.e. the bankruptcy proceedings against insurance companies), the bankruptcy and reorganisation law (Journal of Laws No. 60, item 535) should be referred to. E. Kowalewski and T. Sangowski, "Prawo ubezpieczeń," 195.

24. In this respect, the most important acts are: The Commercial Partnerships and Companies Code (*Kodeks spółek handlowych*) of 15 September 2000 (Journal of Laws No. 94, item 1037 with changes), The Economic Activity Act (*Prawo działalności gospodarczej*) of 19 October 1999 (Journal of Laws No. 10 1, item 1178 as amended), the Personal Data Protection Act (*Ustawa o ochronie danych osobowych*) of 29 August 1997 (Journal of Laws 2002 No. 101, item 926) or The Public Trading in Securities Act (*Prawo o publicznym obrocie papierami wartościowymi*) of 21 August 1997 (Journal of Laws 2002 No. 49, item 447 as amended).

25. E. Kowalewski, "Prawo ubezpieczeń gospodarczych – ewolucja i kierunki przemian," (Bydgoszcz, 1992), 89–93, and the references provided.

26. E. Kowalewski, "Prawo ubezpieczeń gospodarczych," (Bydgoszcz – Toruń: Oficyna Wydawnicza Branta, 2002), 109. See also article 12 (1) of the 2003 Insurance Activity Act.

27. As for "statutory insurance", there was a view under the regime of The Property and Personal Insurance Act of 2 December 1958 that in the case of compulsory insurance legal relations were not civil law relations. W. Warkalno, "Ubezpieczenia a kodyfikacja prawa cywilnego," *Wiadomości Ubezpieczeniowe* 3 (1960): 11–15 (off-print).

The said Act defines compulsory insurance as civil liability or property coverage which is required by a statute or an international agreement ratified by the Republic of Poland (article 3 (1)).²⁸ The new wording is a departure from the previous, quite peculiar division into compulsory insurance and insurance to which “a statutory obligation to effect insurance” applies, which led to terminological confusion.²⁹ This confusion resulted in the division of compulsory insurance into two categories. In the first category, it was the Minister of Finance³⁰ who was responsible for the establishment of the general conditions of compulsory insurance, whereas in the other, the scope of insurance, the date when it became obligatory and the minimum guarantee sum were determined by the law, with insurance companies establishing the general conditions.³¹ If we add another division of these types of insurance – as suggested in legal scholarship – into “universal compulsory insurance”³² and “professional, corporate or trade insurance”, it can be observed that there was chaos in this field, and above all, there was a need for introducing a legal order and defining the legal character of all types of insurance that were not fully voluntary. It is open to discussion whether the Compulsory Insurance Act really dealt with these issues, because one may easily notice that there are still – at least in the Act’s original wording – categories of compulsory insurance regulated by the Act³³ and a much longer list of “non-statutory” compulsory insurance, whose general conditions are established by particular insurance companies.³⁴

That is why despite the unambiguous definition of compulsory insurance included in article 3 (1), the legal regime is divided. There are two groups of compulsory insurance: universal compulsory insurance (including motor third party liability insurance, farmers’ liability insurance and farm buildings insurance) and other types of compulsory insurance. The former is regulated in Chapters 2–4 of the Act, which means that both provisions included in particular chapters and those concerning all compulsory insurance are applied. The situation is slightly different when it comes to the other group of compulsory insurance covered by other laws or international conventions ratified by Poland. Only the general provisions set forth in the first chapter of the Act (articles 1–22) are applied to this group.

28. There is also the third group of compulsory insurance left outside the scope of Finance Minister’s regulations – e.g. personal accident insurance (NW) for athletes (article 52 of the Act on Physical Culture (*Ustawa o Kulturze Fizycznej*) of 18 January 1996; Journal of Laws No. 25, item 113)) and the compulsory sea carrier’s liability insurance for personal injury of or property damage to passengers (article 182 of the MC).

29. W. W. Mogiński, “Ubezpieczenia obowiązkowe w polskim systemie prawnym,” *Prawo Asekuracyjne* 1 (1997): 13–14, and “Tendencje rozwojowe systemu prawnego ubezpieczeń obowiązkowych,” *Prawo Asekuracyjne* I (1999): 31 et seq., and “Założenia systemowe projektu nowej regulacji prawnej ubezpieczeń obowiązkowych – zagadnienia wybrane,” *Prawo Asekuracyjne* 3 (2000): 17 et seq.; See also B. Mrozowska and A. Wnęk, *Ubezpieczenia gospodarcze – zbiór przepisów prawnych* (Bydgoszcz: Oficyna Wydawnicza Branta, 1996), 183–184.

30. E.g. compulsory liability insurance for drivers, farmers’ liability insurance, professional indemnity insurance for lawyers, legal advisers and notaries. For a list of insurance to which the “prescriptive OWU” was applicable, see also E. Kowalewski, “Prawo ubezpieczeń gospodarczych”, 63–64.

31. For a complete list of compulsory insurance, see: E. Kowalewski, ed., “Stan prawny ubezpieczeń obowiązkowych w Polsce”, [wykaz z komentarzem] (Warszawa: PIU, 2013).

32. Such division was proposed in the Legislative Objectives, mentioned in footnote 20.

33. Liability insurance for vehicle owners, liability insurance for farmers and farm buildings insurance (article 1 (I) and article 4 (1)–(3) the Act).

34. The remaining types of compulsory insurance (except for those mentioned in the previous footnote) should be included. E. Kowalewski and W. W. Mogiński, “The Sejm opinion on the bill of July 2002,” included in parliamentary print no. 543.

Accordingly, compulsory insurance – due to its social importance and wide scope of application (especially regarding the number of potential claimants) – became the subject of comprehensive regulation. This is the result of repeatedly voiced demands to replace current departmental instruments with statutory regulations. The new law is among the significant sources of law on the insurance policy, only one rung down from the CC in the ranking of legal acts. Both the demand for the unified regulation of an insurance contract and the requirement to include all provisions directly or indirectly applicable to the insurance policy in one statutory act were met.³⁵

In the Act the term compulsory insurance is narrowed to civil liability insurance (*ubezpieczenie odpowiedzialności cywilnej, OC*) and property insurance (article 3 (I)). This approach is highly debatable for at least two reasons. Firstly, nobody knows how to treat the requirement to effect accident and sickness insurance (personal accident insurance – *ubezpieczenie NW*) for athletes as laid down in the Act on Physical Culture³⁶ (of 18 January 1996). According to article 52 of the said Act, not only are athletes entitled to personal accident insurance, but on top of that it is sports clubs or associations of athletes that should take out such coverage for their members. If this insurance is obligatory and the law governing physical culture is still in effect (it has not been changed or repealed by Chapter 9 of the Compulsory Insurance Act³⁷) the said statutory provisions are obviously contrary to article 3 of the Compulsory Insurance Act. In this situation, it is unclear whether personal accident insurance for athletes is still obligatory or not.³⁸

The second reason for the critical evaluation of the narrowing of the compulsory insurance category is the fact that it is difficult to predict whether, for any social or other reasons, there will be a need to introduce a new type of obligatory insurance.

The greatest achievement of this reform was emphasising the nature of the legal relation of compulsory insurance as a civil law relation, as is the case with voluntary insurance. This can be called the principle of uniformity of the legal relation of insurance.³⁹ Consequently, civil law determines the legal regime of the compulsory insurance contract similarly to voluntary insurance. The CC provisions on the insurance contract will apply directly to those compulsory insurance contracts that are not regulated in the Compulsory Insurance Act.⁴⁰ It should be stressed that in the field of compulsory insurance, the regulation laid down in the said Act is *lex specialis* to the CC provisions on the contract of insurance. It resolves doubts whether the said CC provisions will cover a particular type of compulsory insurance that is not regulated by special decrees or statutory regulations. Until 2003, it posed a problem both in legal scholarship and in court practice.⁴¹

35. The secondary legislation drawn up by the Ministry of Finance regarding individual laws governing insurance obligation (articles 141–147 and articles 149–158) do not seem to respect this rule, because in many cases they enter into the realm of civil law.

36. Journal of Laws No. 25, item 113 as amended.

37. The bill authors seem to have overlooked the issue of compulsory insurance, and the Parliament did not correct their mistake. This is, for sure, another proof of the poor quality of the national legislation.

38. W.W. Mogiński, “Ubezpieczenia obowiązkowe,” 22–23.

39. It was called “the uniformity rule of the insurance legal relation” (“zasada jednności prawnego stosunku ubezpieczenia”), W. Warkatko, “Umowa ubezpieczenia w kodeksie cywilnym,” *Państwo i Prawo* 10 (1964): 402, W.W. Mogiński, “Ubezpieczenia obowiązkowe,” 13–14, and E. Kowalewski, “Prawo ubezpieczeń gospodarczych,” 41.

40. This unambiguously follows from article 22 (1) of the Act.

41. E.g. there were doubts as to whether article 806 of the CC regulated a scope of the current compulsory building insurance. See SN judgment of 6 January 1992, III CZP 132/91, OSN 1992, No 7–8, item 126.

It ought to be observed that the said Act became a significant part of insurance contract law that complements the code regulations. The code regulations relate to all insurance policies but they apply to compulsory insurance contracts, only insofar as no provisions to the contrary are laid down in the Act.

The question whether mandatory insurance against fire and other perils for privately-owned farms should be maintained in the Act as compulsory insurance is open to discussion. Because of the fact that such policies do not cover a common risk (i.e. regarding all buildings in Poland) or all categories of building owners (only those who have farm buildings), only one conclusion can be drawn here – the obligation to maintain such insurance violates the fundamental constitutional principle of equality before the law.⁴²

There may be some reservations about codifying all the regulations on insurance institutions, e.g. the Guarantee Insurance Fund, in one act. The Act regulates compulsory insurance issues as well as the structure, objectives and the functioning of the PBUK and UFG. Still, it is noteworthy that the latter's objectives go beyond the compulsory insurance sector.⁴³ Moreover, most of the regulations concerning both institutions are based on policy decisions. According to the principle that individual acts forming the "insurance package" regulate distinctive subject matters, policy issues regarding insurance companies and other entities engaged in insurance business were to be covered by the Insurance Activity Act. Hence, the regulations on the UFG in the Compulsory Insurance Act may be considered to be a violation of the accepted legislative principle.⁴⁴

On the basis of this Act, Polish regulations were adapted to the EU legislation. This concerns particularly compulsory liability insurance for vehicle owners. For example, taking into consideration the measures contained in Article 2 of the Third Motor Directive⁴⁵ the single premium principle was enacted. The said principle provides that motor vehicle owners (possessors) should be guaranteed coverage across the whole European Union under one insurance policy and for a single fee. The creation of the UFG's information agency (the central register of motor liability insurance policies) and the development of the rules of its cooperation with the Central Register for Vehicles and Drivers (CEPIK – Centralna Ewidencja Pojazdów i Kierowców) are significant issues for the operation of compulsory motor insurance. The CEPIK was created under the Road Traffic Act, which also formulated its objectives.⁴⁶ Under motor third party liability insurance and farmers' liability insurance the policies cover intentional fault of the policyholder and intentional fault of persons for whom the policy holder is vicariously liable, subject to exceptions as set forth in a statute or an international agreement (article 9 {2} of the Compulsory Insurance Act). This scope of coverage is not found in other legal systems.

42. E. Kowalewski and T. Sangowski, "Prawo ubezpieczeń," 246.

43. According to article 113, if the life insurance company declares bankruptcy, the Fund shall meet all the claims of eligible claimants, on the basis of a claims' list.

44. E. Kowalewski and A. Wąsiewicz, "Założenia legislacyjne," 18 and E. Kowalewski and T. Sangowski, "Ocena stanu reformy ustawodawstwa ubezpieczeniowego," *Prawo Asekuracyjne* 3 (2004): 32 et seq.

45. M. Wichtowski, "Czwarta Dyrektywa w sprawie ubezpieczeń komunikacyjnych – nowe wyzwania dla europejskiego i polskiego rynku ubezpieczeniowego," *Prawo Asekuracyjne* 2 (2001): 23–33 and "Ochrona interesów poszkodowanych w świetle projektu Piątej Dyrektywy w sprawie ubezpieczeń odpowiedzialności cywilnej posiadaczy pojazdów mechanicznych," *Prawo Asekuracyjne* 3 (2003): 4–14.

46. The uniform text in Journal of Laws 2003 No. 58, item 515, as amended.

It is a pity that such a daring, yet controversial, solution was not accompanied by affording the insurer the right to refuse a proposer's offer (article 5 of the Compulsory Insurance Act). This does not imply that the Act is nothing but defective in this regard. For instance, an amendment has been made to article 16 [1] [3] of the Act (see the amendment to the Compulsory Insurance, the Insurance Guarantee Fund and Polish Motor Insurers' Bureau of 29 January 2004, Journal of Laws No. 26, item 225) in respect of the obligations of a person involved in any way in an accident covered by compulsory insurance. Many other measures adopting principles specified in other EU directives were enacted as well.⁴⁷

The Act does not introduce any regulations or guidelines on the general conditions of compulsory insurance that are not regulated in the Act. Nevertheless, it is correct to assume that in the future insurance companies will be entitled to freely develop the language of their OWU, as is the case with OWU related to all classes of voluntary insurance. There are no formal or systemic obstacles. Of course, such general conditions of insurance will not be standard conditions. In the case of compulsory insurance OWU have to comply with the Compulsory Insurance Act and the Act's provisions on the introduction of the insurance obligation. Incidentally, statutory regulations on universal compulsory insurance should not be, as they sometimes are, referred to as "general insurance conditions".⁴⁸

4. The Act on Insurance and Pension Supervision and on the Insurance Ombudsman

Legal regulations on insurance supervision are a classic example of norms established in secondary legislation. Accordingly, their inclusion in separate statutory acts was deliberate. Notwithstanding this, a decision to separate the laws governing insurance supervision from those regulating conditions for undertaking insurance activities was a questionable one.⁴⁹ All these issues could have been included in one legislative act, because there is a close connection between them, and the norms that regulated them, are both norms of secondary legislation and political norms. The idea to prepare a separate bill concerning the supervision was rather a political decision (not a legislative and dogmatic one) aimed at reducing the number of central public administration bodies.⁵⁰ The political decision to combine two authorities in charge of regulating the narrowly understood insurance services and the pension funds activities (*otwarte fundusze emerytalne*)⁵¹

47. This especially concerns the solutions of the Fourth Motor Directive: the definition of the injured party, the information centre on vehicles and drivers, a claims representative, the compensation body, the uniform time-limit for the payment of compensation and other issues. M. Wichtowski, "Czwarta Dyrektywa", 24 and et seq., and J. Orlicka and M. Orlicki, "Europejski system dochodzenia roszczeń ubezpieczeniowym za wypadki komunikacyjne za granicą. Komentarz", [Bydgoszcz–Poznań: Oficyna Wydawnicza Branta, 2003].

48. W.W. Mogiński's view cited in the parliamentary opinion, cited above.

49. In the *Legislative objectives* there was a suggestion that the Insurance Act package should include only three acts (the Insurance Activity Act should also cover supervision). The Parliament passed them on 23 August 2001 but on 10 September 2001 the President of the Republic of Poland vetoed them. The authors of the act package concept did not see the need to pass a separate bill on insurance supervision, J. Łopuski, E. Kowalewski, op. cit., 5–18.

50. This concept (presented by the Government in autumn 2002) was realised in the first quarter of 2003.

51. Two supervisory bodies were superseded by the Insurance and Pension Funds Supervisory Commission (KNUiFE – *Komisja Nadzoru Ubezpieczeń i Funduszy Emerytalnych*). See the Act of 1 March 2002 on Changes in Organisation and Functioning of the Central Government Bodies and Units Subordinate to them and on Amendments to Certain Acts (Journal of Laws No. 25, item 253).

resulted in the enactment of a separate supervision act because it was impossible to exclude pension funds issues from the scope of regulation.

Unfortunately, the idea to create one separate act that would regulate all the insurance supervision issues was not enforced consistently. This weakened the positive impact of the new law – especially with regard to the principles of good legislation.⁵² This is because of the fact that it regulates neither the objectives nor the insurance supervision prerogative or its aims. These issues have been included in the Insurance Activity Act. Consequently, the Insurance Supervision Act is not really the “supervision” act but only the “supervisory authority act” (*organ nadzoru*) that regulates the functioning of the KNUiFE. If so, the title of the Act should have been adapted accordingly and changed into the “Insurance Supervisory Authority Act”.⁵³

Above all, it is also unclear why insurance supervision (which is, in fact, government supervision) was combined with the regulation on the Insurance Ombudsman authority, which is neither a supervisory body nor an institution or government body and its specific objective (insurance protection) has nothing to do with the government supervision of insurance activity. Incidentally, it should be noted that such an insurance supervision formula goes hand in hand with a considerable development of the Insurance Ombudsman powers. In practice, the Ombudsman will not be able to do its job properly.⁵⁴

The Act also aimed at adaptation of the Polish insurance and pension law to the European Union law (most importantly, the regulations on financial supervision). It should be mentioned in this context that the organisational framework of supervisory bodies regulating the financial markets (including insurance and pension services market) remains out of the scope of the EU law. There are a few references in this regard that give EU members complete freedom to regulate operations of such bodies and their place within the public administration system. The following entities can act in the capacity of supervisory bodies: central government bodies (not always operating functionally or formally as part of public administration) and in some cases state-owned or private companies. The EU Member States are mostly responsible for the appointment of such a body and ensuring the maintenance of its independence, especially from the entities it supervises. The EU law lays down only major objects of such institutions and the scope of their activity. Non-discrimination principle⁵⁵ is one of the fundamental principles that supervisory bodies should obey.

The same principle applies to the Insurance Ombudsman. The responsibilities of the Ombudsman are often performed by other institutions or organisations, especially consumer organisations, whose importance is on the rise. It is a direct result of the significance that is given to consumer protection in the insurance and pension services market (as well as across all financial markets). It is one of the fundamental premises of the single EU insurance market.

52. The Regulation of the Council of Ministers of 20 April 2002 on the principles of good legislation [Journal of Laws No. 100, item 908].

53. E. Kowalewski, “Ocena nowego ustawodawstwa ubezpieczeniowego,” *Państwo i Prawo* 12 [2003]: 26 and E. Kowalewski and T. Sangowski, “Prawo ubezpieczeń”, 21 and 376 and et seq.

54. E. Kowalewski and T. Sangowski, “Prawo ubezpieczeń”, 389 et seq. and 474 et seq.

55. T. Sangowski, “Nadzór państwa nad działalnością ubezpieczeniową w Unii Europejskiej i w Polsce,” in *Stan europeizacji polskiego prawa ubezpieczeń gospodarczych w przededniu członkostwa w UE*, (Warszawa: Zeszyt Naukowy Uniwersytetu Kardynała Stefana Wyszyńskiego).

5. The Insurance Mediation Act

The previous 1990 Insurance Activity Act provisions on insurance mediation were not proper measure as regards the principles of good legislation.⁵⁶

Insurance mediation is a separate economic activity, different from the insurance activity. In legal terms, agents conclude civil law contracts with persons who look for insurance cover (the insured) or with those who offer such cover (insurance companies). Agents act under a contract for services, agency agreement or intermediation agreement, which as the law stands is classified as an innominate contract.⁵⁷ Nonetheless, the essence of the insurance activity comes down to writing insurance policies, reinsurance policies and surety policies.⁵⁸

Owing to the difference between these two types of activity they have to be regulated separately. This principle was also applied in the interwar period when insurance mediation was contained in a separate statutory instrument.⁵⁹ Not only was insurance mediation regulated fragmentarily in the Insurance Activity Act of 1990, but also it diverged, in many aspects, from the EU standards set up in directives or even violated them.⁶⁰ The principle according to which it is the supervisory body that provides licences to agents is a prime example of this incompatibility, as such a requirement is not laid down in any EU directive. There was also a contradiction between the requirement (applicable to those who want to obtain permission to pursue an agency or brokerage activity)⁶¹ to be permanently registered on the territory of the Republic of Poland and the UE law on the freedom to provide services for insurance agents and brokers in all EU Member States.

One of the serious shortcomings was the lack of the central insurance agents' register that would be open and accessible for all interested persons.⁶²

There was also a problem with "multi-agents" who carried out their activities, despite the fact their relationship with an insurance company or a customer was not regulated. There were no effective legal or financial instruments that would protect the interests of the person who was

56. Issues related to insurance mediation (articles 37.d-37.n) were added to the Insurance Activity Act by the amendment of 8 June 1995 (Journal of Laws No. 96, item 478). The amendment introduced to the Act a new chapter on insurance mediation (3.a), which before that had not been legally regulated. This legislative action was contrary to the principles of good legislation (§ 64 of the Regulation of the Council of Ministers No. 147 of 5 November 1991) related to good legislation – M.P. No. 44 item 310]. At present the Prime Minister's Regulation of 20 June 2002 (Journal of Laws No. 100, item 908) concerning "The principles of good legislation" (*Zasady techniki prawodawczej*) (Journal of Laws No. 100, item 908) forbids to use the amendment procedure to regulate issues that are not included in the scope of the previous act" (§ 93 (2)).

57. Articles 517–522 of the Code of Obligations of 1933.

58. Article 1a (2) (1) of the 1990 Insurance Activity Act.

59. The Regulation of the President of the Republic of Poland of 4 October 1934 (Journal of Laws No. 96, item 864).

60. E.g. Directive 77/92/EEC of 13 December 1976, Directive 86/653/EEC of 18 December 1986, Directive 2002/92/EC of 9 December 2002 on insurance mediation, which were to replace Directive 77/92/EC.

61. The European Integration Committee (*Komitet Integracji Europejskiej*) stated (8 May 2002) that this objective is against the European Union requirements (DH/1245/2002/DPE – 01).

62. Until 2003 the central register has involved only brokers (article 37 (1) (1)–(2) of the 1990 Insurance Activity Act). The registers of agents were maintained by insurance companies (article 37 (F) (4) of the Insurance Activity Act). See E. Kowalewski, "Prawo ubezpieczeń gospodarczych," 291.

aggrieved by such multi-agents. The Act resolved this problem by imposing on multi-agents a duty to take out civil liability insurance (Article 11 sec. 3).

The new insurance mediation regulation did not cause any turmoil on the insurance mediation services market. The introduced right of licensed brokers (article 50 (1)) and insurance agents (article 51 (2)) to continue their professional activities merits our approval.

The requirements that must be met by agents (article 9) and brokers (article 28 (3)) were not changed radically.

The Act covers legal issues related to insurance mediation. It regulates both the subjects and the objects of insurance mediation business, establishing the categories of persons carrying out agency activities and defining the “insurance agency” and the “insurance agent’s activity” (in article 4).

The Act has been adjusted carefully so that it is compatible with the MC provisions on the agent and the shipping broker (article 3).

This Act definitely resolves doubts concerning the lawfulness of the “multi-agent”. The introduction of the requirement imposed on the multi-agent to maintain compulsory liability insurance seems to be justified (article 11 (3)).

The law maintained the principle that some categories of entrepreneurs (who, in addition to their primary business, carry out insurance agency activities) can provide limited insurance agency services through employees who do not have to undergo training and pass an exam (article 10 (1)). However, agents of such entrepreneurs have to be entered into the agents’ register.

It was a good decision to introduce the central register for all insurance agents, which is open and publicly accessible (article 37 (3)). As for insurance agents, this was a novel solution. For several years academics and practitioners called for the creation of such a register. It is of great significance when it comes to protecting the interests of insurers. Moreover, the establishment of the register was required under the EU law.

Another positive development of the Act are measures aimed to counteract corruption and prevent connections between insurance companies and other agents. Any such conduct could lead to interdependence and connections that go against the insurers’ interests (see article 15 for agents and article 24 for brokers).⁶³

It ought to be stressed that further amendments to the Insurance Mediation Act are essential because of the need for its full compliance with the EU Directive of 2002.⁶⁴

II. The modernisation of the insurance contract law

The 2003 Insurance Activity Act brought in a number of substantial changes in the CC involving especially the insurance contract provisions (articles 805–834).⁶⁵

Firstly, article 812 of the CC has been improved. The Code now regulates the following issues: the delivery of OWU before the signing of the contract, mandatory wording of OWU, the insurer’s right to withdraw from the contract, a prohibition of a contractual clause that bans the termina-

63. E. Kowalewski and T. Sangowski, “Ocena stanu reformy,” 26–46.

64. See footnote 74 and T. Mintoft-Czyż, “Podmiotowa czy przedmiotowa definicja pośrednictwa,” *Prawo Asekuracyjne* 2 (2004): 19–24.

65. E. Kowalewski, “Umowa ubezpieczenia w kodeksie cywilnym po nowelizacji,” *Prawo Asekuracyjne* 1 (2004): 3–12.

tion of an insurance contract for a period longer than two years, the right of the parties to determine their rights and obligations differently from what is provided in OWU, and a duty to disclose the variations between the contract and OWU to the policyholder. The issues mentioned above had previously been included in the provisions of the 1990 Insurance Activity Act (articles 6 and 7).

Secondly, article 8 (4) of the previous 1990 Insurance Activity Act which regulated the right of the aggrieved party to pursue a liability claim directly from an insurance company ("*actio directa*") was transferred to the CC (article 822 of the CC).

Thirdly, the new wording of article 824 was passed. The said article provides for the indemnity rule (that prohibits the payment of indemnity in the amount exceeding the value of actual damage) and the effects of double and multiple insurance. These issues were contained in the Act of 1990 (article 8 (1–2)), however the currently applicable code provision on double insurance was changed and clarified.

Apart from the fact that some civil law issues were "transferred" to the CC, some amendments to the Insurance Activity Act were carried out, whereas other provisions were completely changed. The following provisions were amended:

- article 807 (2) (permission to apply both foreign and domestic OWU that are contrary to the CC provisions on the insurance contract in foreign insurance transactions),
- article 812 (1) (absolute obligation to provide OWU to the policyholder before the signing of the contract),
- article 812 (8) (insurance company's obligation to inform the policyholder in writing about the variations between the contract and OWU; a failure to adhere to a written form results in the variations becoming ineffective),
- article 817 (2) (insurance company's obligation to render performance within additional 14 days from the day on which the circumstances necessary to establish the insurer's liability have been clarified, where the clarification of the same or determination of the amount of compensation was not possible within the initial period of 30 days as set forth in article 817 (1)).

As for the new provisions that were missing in the 1990 Act or the then current CC provisions, we should note that these solutions should be classified according to a subject matter criterion. Accordingly, these provisions can be divided into the following groups⁶⁶:

- definition of the "mandatory wording of OWU", information about the court which settles disputes concerning insurance contracts and information about how to make a claim,
- imposition of a duty to disclose to the policyholder, who is a natural person, information on the manner of and procedures for claims' investigation and information on a body competent to investigate such claims (article 812 (3)),
- the insurance company obligation of indicating the law governing the insurance policy which involves an international element (article 812 (7)),
- in the case of liability insurance – extension the insurance protection, applicable under the condition that the accident happened in the insurance period and the possibility of determining responsibility for the accidents that took place in the pre-contractual period (article 822 (2–3)),
- a rule that the provisions of Book Three of the CC (that is general regulations on contract obligations) can be applied even when the policyholder is not a consumer.

66. E. Kowalewski and T. Sangowski, "Prawo ubezpieczeń," 226 and E. Kowalewski, "Umowa ubezpieczenia w kodeksie cywilnym po nowelizacji," *Prawo Asekuracyjne* 1 (2004): 3–12.

The Commission for the Codification of Civil Law prepared a new amendment of insurance contract rules in 2005. It enacted as the Civil Law Revision Act of 13 April 2007.⁶⁷

The legislative reform has effectively addressed the problems pertaining to the terminology. At the same time, it has failed to correctly or fully implement certain objects of the reform and partially damaged the transparency of the system.

We applaud the revocation of the legally outrageous article 384 (5) of the CC, which extended the application of consumer protection measures (specifically, the regulation on unfair terms in consumer contracts) onto all insurance contracts. The defectiveness of article 384 (5) CC manifested itself not only in the provision's structure, but also in a way it "favoured" insurance contracts by subjecting them en masse to the regime of consumer protection, and hence to all restrictions resulting from the application of this regime.

The introduction of the new definition of the subject matter of non-life insurance (especially property and liability insurance), provided for in article 821 CC, was another long-awaited legislative change which was supported and warmly embraced by legal scholars.⁶⁸ The concept of insuring a legal and calculable interest has been put into the centre of the definition. This approach not only adheres to the modern doctrine of the subject matter of insurance, but also clearly breaks away from a relict notion of the Marxist doctrine, elaborated on and endorsed by W.K. Rajcher, who attempted to equate the subject matter of insurance with materialistic objects of reality.⁶⁹

Another positive development that merits our approval is the theoretical model of the insurance contract for the benefit of a third party [article 808 (1)–(5) CC]. However, we should note that a distinguished professor of insurance law has criticised this legislative solution, calling it "improper" and "erroneous."⁷⁰

The legislator finally rejected the previously existing division between domestic and foreign [international] insurance markets, established under article 807 (2) CC (in its former wording). The said article allowed for the application of general conditions of insurance that were incompatible with the mandatory rules of the insurance contract law in contracts involving international insurance transactions.

The former reading of article 827 gave rise to numerous controversies and misunderstandings in legal scholarship and case law.⁷¹ The modified article 827 (1) limits the scope of the non-insurability rule, which now covers only an intentional fault of the policyholder, and hence does not extend to an intentional fault of the auxiliaries for whom the insured is vicariously responsible. Unfortunately, since the new language of the article has failed to include consequences of the intentional fault (or gross negligence) on the part of the policyholder's representatives, the change cannot be approved without reservations. Moreover, in our opinion the discussed legal provision is capable of additionally disturbing insurance practice and case law.

The revision of the insurance contract law has also brought about several other modifications that merit appreciation. In general, the developments have taken the right course, either correcting or supplementing the existing rules.

67. Journal of Laws No. 82, item 557.

68. E. Kowalewski, "Prawo ubezpieczeń gospodarczych," (Bydgoszcz, 1992), 148–150.

69. W. K. Rajcher, "Społeczno-historyczne typy ubezpieczeń," (Warszawa, 1951), 161.

70. J. Łopuski, "Reforma cywilnego prawa ubezpieczeniowego," 71–72.

71. J. Łopuski, "W sprawie wykładni article 827 § 1 k.c. i potrzeby nowego uregulowania umowy ubezpieczenia," *Prawo Asekuracyjne* 2 (2002): 3–11.

Most changes made in the 2007 revision of insurance contract law were rightly considered as flawed.⁷² Some of them bring about doubts and confusion, even in such areas of insurance practice where there had been no such doubts or confusion before (e.g. the issues regarding reimbursement of premiums upon the expiry of the contract – article 813 CC).

Some other changes are examples of the “systemic deficiencies” of the amended law. It is hard to understand, for example why article 805 (4) commands the application of articles 385¹–385² CC to all contracts of insurance transacted by natural persons, regardless of whether a given contract is directly or indirectly connected with the proposer’s commercial or professional activity. Despite the repeal of article 384 (5) CC, the above-mentioned articles 385¹–385² seem to partially uphold the placement of all insurance contracts in the category of consumer contracts. This effect has been reinforced by article 808 (5) CC, a provision which grants the consumer protection remedies established by articles 385¹–385³ CC to the insureds under contracts made for the benefit of a third party, as long as they are natural persons and the insurance contract is not directly connected with their commercial or professional activity. The commented legal provisions interrupt the uniformity of the civil law system. It requires little imagination to observe that this regulation will cause problems in the case of contracts for the benefit of a third party that are concluded by professionals such as legal persons, entrepreneurs, etc.

We share the view that the 2007 revision maintains the faulty classification of the Code rules on insurance contracts, among other things, those set out in articles 805–820 CC.⁷³ Some of these legal rules do not, or should not, apply to life insurance (e.g. article 808 CC, article 820 CC).

The rules referring to the consequences of the insured’s failure to perform his obligations (articles 815–816 CC) exhibit systemic flaws. In principle, the said articles should not apply to contracts of life insurance. By its very nature, article 813 in its new wording does not apply to personal insurance, in particular to life insurance. Hence, it must be considered incorrectly located within the structure of the CC.

Anybody referring to rudimentary faults of the revised insurance contract law cannot ignore a number of legal provisions that add to the regulatory confusion between public and private law matters. A significant portion of civil law rules were enacted in the 2003 Insurance Activity Act (articles 12 (3)–(4), and articles 13–13¹) and in the Compulsory Insurance Act (articles 5, 5¹, 6, 9, 9¹, 12, 13, 16–22). As a result, we have two competing realms of insurance contract law: the realm of voluntary insurance contracts and the realm of compulsory insurance contracts. The interrelations between the two regimes are unclear, as article 22 (1) of the Compulsory Insurance Act fails to properly address the conflicts between the two regimes.

Finally, we should observe that serious regulatory loopholes still exist in the law of insurance contract. For example, accident and sickness insurance, group insurance, and general (floating) insurance have been left almost unregulated. It should be noted that with the mere six articles devoted to the contract of life insurance, this type of insurance has received a highly insufficient and, least to say, rather fragmented regulation.

We can point to several important, more detailed legal measures that were introduced to the CC in 2007 and merit critical evaluation. Regretfully, they have made a negative impact on the insurance practice. A list of these regulations is presented below:

72. J. Łopuski, “Reforma cywilnego prawa ubezpieczeniowego,” 80.

73. *Ibidem*.

- The partly incorrect language of article 807 (1) has been maintained;⁷⁴
- There is a confusion involving the contract for the benefit of “whom it may concern” (see article 296 (2) MC) and the contract for the benefit of a third party (article 808 CC);⁷⁵
- The unjustified repeal of article 812 (1) CC and a referral to article 384 CC have created confusion in respect of delivery of General Conditions documents to the insured;⁷⁶
- The rules governing the reimbursement of premium in the case of expiration of insurance before the end of contractual term are unclear (article 813 CC);
- There is no regulation on the legal consequences of a change in the probability of an insured accident occurring (article 816 (1)–(3) CC);
- The new version of article 813 CC introduced a harmful principle of total recalculation of premiums;
- The autonomy of the insured has been unreasonably limited in respect to the transfer of rights under an insurance contract (article 823 (1) CC);
- A dubious and equivocal regulation of double and multiple insurance has been introduced (in article 824¹ (2) CC);
- Extensively restrictive obligations relating to the duty to safeguard the insurer’s recourse (subrogation) rights after the insured accident have been imposed on the insured (article 826 (2) CC);
- The new regulation has ignored the problem of intentional perpetration of an insured accident by a representative of the proposer (article 827 (1) CC);

defective

Conclusions

The above analysis leads to some general conclusions. The modernisation process of Polish insurance law has not always been consistent. The flawed legal reform of 2007 discussed in this article proves that it is necessary to consider a comprehensive regulation of Polish insurance law which would encompass all aspects of insurance business under the heading of a single legal act. The idea of such an act is elaborated upon in another contribution in this issue.⁷⁷

References

- Kowalewski E., “Prawo ubezpieczeń gospodarczych – ewolucja i kierunki przemian,” Bydgoszcz, 1992.
- Kowalewski E., “Propozycje zmian w ustawie o ubezpieczeniach majątkowych i osobowych,”
In vol. XI of *Studia Ubezpieczeniowe*. Warszawa – Poznań: Wydawnictwo Akademii Ekonomicznej w Poznaniu, 1989.
- Kowalewski E., “Prawo ubezpieczeń gospodarczych,” Bydgoszcz – Toruń: Oficyna Wydawnicza Branta, 2002.

74. Critically, J. Łopuski, “Reforma cywilnego prawa ubezpieczeniowego,” 70.

75. Ibidem., 71.

76. See, E. Kowalewski, “Obowiązek doręczenia ubezpieczającemu ogólnych warunków ubezpieczenia,” *Wiadomości Ubezpieczeniowe* 7–8, 15–20 (2007).

77. E. Kowalewski, “The need for implementing an Insurance Code in Poland,” in this issue.

- Kowalewski E., "Ocena nowego ustawodawstwa ubezpieczeniowego," *Państwo i Prawo* 12 [2003].
- Kowalewski E., and Sangowski T., "Prawo ubezpieczeń gospodarczych. Komentarz," Warszawa: Lexis-Nexis, 2004.
- Kowalewski E., "Obowiązek doręczenia ubezpieczającemu ogólnych warunków ubezpieczenia," *Wiadomości Ubezpieczeniowe* 7–8 [2007].
- Kowalewski E., Fuchs D., and Ziemiak M., "Implementacja dyrektywy reasekuracyjnej do polskiego porządku prawnego," *Prawo Asekuracyjne* 2 [2009].
- Kowalewski E., ed., "Stan prawny ubezpieczeń obowiązkowych w Polsce (wykaz z komentarzem)," Warszawa: PIU, 2013.
- Kowalewski E., and Wąsiewicz A., "Założenia legislacyjne reformy prawa ubezpieczeń gospodarczych," Toruń–Poznań, 1997.
- Kowalewski E., "Aspekty prawne pośrednictwa ubezpieczeniowego," In vol. II of *Przemiany polskiego prawa*, edited by E. Kuśtra Toruń: Studia Iuridica Toruniensia, 2002.
- Kowalewski E., "Umowa ubezpieczenia w kodeksie cywilnym po nowelizacji," *Prawo Asekuracyjne* 1 [2004].
- Kowalewski E., and Sangowski T., "Prawo ubezpieczeń gospodarczych. Komentarz," Warszawa, 2004.
- Łętowska E., "Kształtowanie się odrębności obrotu mieszanego," in *Tendencje rozwoju prawa cywilnego*, Wrocław: Ossolineum, 1983.
- Łopuski J., "Reforma cywilnego prawa ubezpieczeniowego: uwagi na marginesie proponowanych zmian przepisów kodeksu cywilnego dotyczących umowy ubezpieczenia." in *Umowa ubezpieczenia. Dyskusja nad formą prawną i treścią unormowań IInd edition*, Warszawa, 2008.
- Łopuski J., "Kodeks morski 2001. Tekst Ustawy i uzupełniających ją umów międzynarodowych z komentarzem," Bydgoszcz – Toruń: Oficyna Wydawnicza Branta, 2002.
- Łopuski J., "W sprawie wykładni article 827 § 1 k.c. i potrzeby nowego uregulowania umowy ubezpieczenia." *Prawo Asekuracyjne* 2 [2002].
- Mogilski W. W., "Ubezpieczenia obowiązkowe w polskim systemie prawnym," *Prawo Asekuracyjne* 1 [1997].
- Mogilski W. W., "Założenia systemowe projektu nowej regulacji prawnej ubezpieczeń obowiązkowych – zagadnienia wybrane." *Prawo Asekuracyjne* 3 [2000].
- Orlicki M., and Pokrzywniak J., "Umowa ubezpieczenia. Komentarz do nowelizacji kodeksu cywilnego," Warszawa, 2008.
- Orlicka J., and Orlicki M., "Europejski system dochodzenia roszczeń ubezpieczeniowym za wypadki komunikacyjne za granicą. Komentarz," Bydgoszcz–Poznań: Oficyna Wydawnicza Branta, 2003.
- Przewalska K., and Orlicki M., "Nowe prawo ubezpieczeń gospodarczych. Wprowadzenie," Bydgoszcz – Warszawa – Poznań: Oficyna Wydawnicza Branta, 2004.
- Reps S., "Nowe ustawy ubezpieczeniowe," *Prawo Asekuracyjne* 3 [2003].
- Sangowski T., "Nadzór państwa nad działalnością ubezpieczeniową w Unii Europejskiej i w Polsce," in *Stan europeizacji polskiego prawa ubezpieczeń gospodarczych w przededniu członkostwa w UE*. Warszawa: Zeszyt Naukowy Uniwersytetu Kardynała Stefana Wyszyńskiego.
- Wąsiewicz A., "Koncepcja legislacyjnej przebudowy systemu prawa ubezpieczeń gospodarczych," *Prawo Asekuracyjne* 3 [1997].
- Wichtowski M., "Czwarta Dyrektywa w sprawie ubezpieczeń komunikacyjnych – nowe wyzwania dla europejskiego i polskiego rynku ubezpieczeniowego," *Prawo Asekuracyjne* 2 [2001].
- Warkało W., "Umowa ubezpieczenia w kodeksie cywilnym," *Państwo i Prawo* 10 [1964].
- Warkało W., "Ubezpieczenia a kodyfikacja prawa cywilnego," *Wiadomości Ubezpieczeniowe* 3 [1960].

Kształtowanie prawa ubezpieczeniowego w Polsce po 1990 r. – analiza krytyczna

W artykule omówiono reformy mające miejsce w polskim prawie ubezpieczeniowym w latach 1990–2007. Na wstępie autorzy skupiają się na potrzebie stworzenia nowoczesnego zbioru przepisów prawa ubezpieczeniowego, w szczególności prawa dotyczącego umów ubezpieczenia i organizacji branży ubezpieczeniowej w gospodarce wolnorynkowej (po 1990 r.). Głównym przedmiotem analizy jest ocena aktów prawnych, zwanych popularnie pakietem ustaw ubezpieczeniowych, przyjętych w 2003 r. Wspomniane ustawy stworzyły solidny fundament dla obszaru ubezpieczeń gospodarczych. Dotychczas była to największa reforma prawa ubezpieczeniowego w historii polskiego ustawodawstwa. Dostosowała ona polskie standardy i rozwiązania do prawa unijnego i dzięki temu wprowadziła krajowy rynek ubezpieczeniowy do jednolitego rynku europejskiego. Ponadto autorzy poddają krytycznej ocenie kilka mniejszych zmian oraz wielką reformę prawa umów ubezpieczeniowych z 2007 r.

Słowa kluczowe: przepisy ubezpieczeniowe, reforma ubezpieczeń, Polska.

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The need for implementing an Insurance Code in Poland

A legislative reform of private insurance law is a difficult and complex process. Private insurance law is a part of a comprehensive body of laws that regulates a very complicated and extensive area. This area consists of the civil-law insurance relations, issues concerning the provisions of administrative and financial law applicable to insurance and all organisational matters. Criminal laws involving insurance, insurance accounting and insurance mediation frameworks, and other areas regulated by the state should also be mentioned. Even such a cursory exemplification of relations falling within the sphere of private insurance law shows that regulating all these matters in a single enactment was at least a defective – if not an anachronic – concept, no matter how extensive and careful intellectual preparation it required. For all these reasons, there is a need for an overhaul of private insurance law which would ensure that this branch of law is properly adjusted to new economic realities. Equally importantly, an optimal legislative model of private insurance law should be selected.

Key words: insurance legislation, insurance code, Poland.

Introduction – the definition of insurance law accepted in Poland

Polish legal scholarship defines insurance law as legal regulations determining relations relevant to the existence and functioning of insurance as an economic category.¹ It is classified as a complex field of law, consisting of legal norms belonging to various domains of law, particularly to civil, financial and administrative law. Despite its complexity, Polish scholars consider insurance law as a distinct branch of law.

1. E. Kowalewski, "Prawo ubezpieczeń gospodarczych. Ewolucja i kierunki przemian", (Wydawnictwo "Branta", Bydgoszcz 1992), 237–238.

1. The reform of Polish insurance law after the year 1990²

A legislative reform of private insurance law is a complex and difficult process. Private insurance law is a part of a comprehensive body of laws that regulates a very complicated and extensive area. This area consists of the civil-law insurance relations (laid down in the Civil Code [hereinafter referred to as “CC”] and the Maritime Code [hereinafter referred to as “MC”]), issues concerning the provisions of administrative and financial law applicable to insurance and all organisational matters. Criminal laws involving insurance, insurance accounting and insurance mediation frameworks, and other areas of state control (procedural aspects, issues relating to labour legislation and tax law) should also be mentioned. Even such a cursory exemplification of relations falling within the sphere of private insurance law shows that regulating all these matters in a single enactment would be at least a defective – if not an anachronic – concept, might it be the most extensive and well-thought piece of legislation.

For all these reasons, there is a need for an overhaul of private insurance law which would ensure that this branch of law is properly adjusted to new economic realities. Equally importantly, an optimal legislative model of private insurance law should be selected.³

The concept of an insurance code, based on the French model, was the most far-reaching solution. Its adoption would consolidate the statutory autonomy of insurance law and above all, it would brought together standard disperse regulations on insurance relations into a single act. Although this concept was presented between ten and twenty years ago,⁴ it has not gained wide recognition.

The concept of partial regulations was put into practice when the CC and the first MC came into effect. It came down to the distinction between the civil insurance law (insurance policy regulations) and administrative, financial and organisational aspects of private insurance. While the civil law part was to be regulated by the codes (the CC and the MC), other issues were to be covered by “insurance acts.”⁵

In fact, this “pragmatic” legislative concept has never been carried out consistently because almost all “insurance acts” interfered with civil law issues. This resulted in an incoherent regulation of the insurance policy, and sometimes caused considerable chaos. The incoherence was particularly visible in the field of compulsory insurance (formerly, “statutory insurance”) where public law elements became mixed up with the private law ones. The chaos was not dealt with by the abolition of the peculiar “statutory insurance” category⁶ and the introduction of the uniform contract

2. This year can be deemed a starting point of the radical legal and constitutional changes in Poland. The changes obviously involved insurance law, previously based on the sophistic demagoguery of the socialist regime which developed the concept of “socialist insurance.”

3. J. Łopuski and E. Kowalewski, “Założenia legislacyjne dalszej reformy prawa ubezpieczeniowego,” *Państwo i Prawo* 11 [1991]: 5–18 and J. Łopuski, “Nowe prawo ubezpieczeniowe a ubezpieczenia morskie: refleksje na temat kierunków rozwoju prawa ubezpieczeniowego,” *Prawo Asekuracyjne* 3 (2004): 5–25.

4. E. Kowalewski, “Propozycje zmian w ustawie o ubezpieczeniach majątkowych i osobowych,” in vol. XI of *Studia Ubezpieczeniowe*, [Poznań, Warszawa–Poznań: Wydawnictwo Akademii Ekonomicznej, 1989], 191–192.

5. In particular, the Property and Personal Insurance Act of 2 December 1958 [Journal of Laws No. 72, item 357; as amended by Journal of Laws No. 16/1964, item 94]; and the Property and Personal Insurance Act of 29 September 1984 [Journal of Laws No. 45, item 245, as amended by Journal of Laws No. 30/1989, item 160].

6. This category was introduced under the Insurance Activity Act of 28 July 1990 (uniform text published in Dz. U. No. 11/1996, item 62 with changes).

of insurance,⁷ because in many cases statutory insurance achieved the status of compulsory insurance. Such contractual compulsory insurance schemes were governed by acts of secondary legislation (mainly by regulations of the Finance Minister) which contravened not only the very idea of the insurance policy but also the CC rules on insurance contracts.⁸

For these reasons, the legislative concept formulated by J. Łopuski and E. Kowalewski⁹ in the early 1990s has begun to gain increasingly wider recognition amongst insurance practitioners and members of relevant legislative committees. The need for drawing up the “Insurance Act Package”, covering insurance activity and insurance supervision, insurance mediation and compulsory insurance, was one of the objectives underlying this concept. It did not specify which legal instruments were to contain provisions governing insurance policies (the CC and the MC, or a separate act on insurance policies). However, the concept emphasized the necessity for a reform of civil insurance law, coupled with the introduction of the package solution.

2. The Insurance Act Package

On 22 May 2003, the Parliament passed four acts¹⁰ regulating private insurance law: the Insurance Activity Act, the Act on Compulsory Insurance, the Insurance Guarantee Fund and the Polish Motor Insurers’ Bureau, the Act on Insurance and Pension Supervision and on the Insurance Ombudsman, and the Insurance Mediation Act.

These acts, commonly called the “Insurance Act Package,” provide a firm foundation for the new legislative framework of private insurance. Their enactment constitutes the most comprehensive and largest reform of this branch of law in the history of Polish legislation. In its wake, Polish standards and measures have been adjusted to the European Union law. This, in turn, resulted in the domestic insurance market effectively becoming part of the single European market.

There is no denying that many of the detailed measures introduced by the acts are imperfect, or even defective – and as such they will have to be amended.¹¹ Nevertheless, the general assessment of this private insurance law reform is quite positive. For the first time in the national legislative history this branch of law has undergone such an extensive, comprehensive and meticulous reform. The reform is of a systemic nature, as not only does it clarify the standards of the insurance market, abolishing the remnants of the Socialist-era insurance – for instance, by abolishing the Finance Minister’s powers to issue “departmental regulations” on compulsory insurance – but it also brings Polish law in line with the requirements set by the European Union

7. Before 1990, this type of insurance was known as the “insurance by operation of law” (in Polish: “ubezpieczenie ex lege”).

8. E. Kowalewski and T. Sangowski, “Prawo ubezpieczeń gospodarczych. Komentarz,” (Warszawa: Lexis Nexis, 2004), 14, see also footnote 9.

9. J. Łopuski and E. Kowalewski, op. cit., p. 5 et seq.

10. The Acts came into effect on 1 January 2004, but their certain provisions came into force when Poland became the member of the European Union, that is on 1 May 2004. (Journal of Laws No. 124, item 1151–1154).

11. See, e.g., the following commentaries and reviews of the discussed acts: E. Kowalewski and T. Sangowski, “Prawo ubezpieczeń. Ustawy z komentarzem,” ed. S. Rogowski (Warszawa: Poltext, 2004), and K. Przewalska and M. Orlicki, “Nowe prawo ubezpieczeń gospodarczych. Wprowadzenie,” (Bydgoszcz–Warszawa–Poznań: Oficyna Wydawnicza Branta, 2004).

and ratified international treaties.¹² On top of that, the reform fundamentally strengthens the consumers' protection in the area of insurance services, aligning the law to a number of the European Union directives.

However, the generally successful 2003 reform completed just the first step of the consolidation of Polish insurance law. It did not consider the modernisation of the most crucial part of insurance law – insurance contract law. There is now a need to take a second step of the reform, whose strategic aim is to design uniform insurance law. Hence, the next legislative initiative should aim at bringing together the public insurance regulation and the rules on insurance contract in one act.

3. Arguments in favour of an Insurance Code¹³

- **ARGUMENT 1:** It is necessary to unify, organise, consolidate and ensure the coherence of a large number of dispersed, chaotic and inconsistent regulations governing the socially and economically coherent area of **insurance relations** (excluding social insurance schemes). Insurance law should finally and definitely acquire its distinctive identity and the status of a fully independent branch of law.
- **ARGUMENT 2:** The basic terminology of insurance law must be clarified and arranged in an orderly manner, which involves defining core notions and measures, formulating insurance law principles and defining the limits of their application. There is a need for developing a new and appropriate **system for the classification of various branches of insurance law**, which would comply with the existing regulatory framework and include such areas as insurance contract law, insurance activity law and insurance supervision law, as well as compulsory insurance schemes, special regulation of consumer relations, insurance mediation and international insurance relations.
- **ARGUMENT 3:** Domestic regulations on private insurance should be adjusted to the European standards and the **EU law** – Directives, Council Regulations and treaties – must be transposed, to the extent possible, into national legal systems. In particular, development of an insurance code would create an opportunity to make use of the solutions presented by the Restatement of European Insurance Contract Law, which may be either en masse implemented into domestic legal systems, or autonomously incorporated into individual insurance contracts, following the example of INCOTERMS in international trade.
- **ARGUMENT 4:** Polish legislative framework should be brought in line with the **model** and developed contemporary European legal systems which have opted for and effectively implemented insurance code concepts (France, Italy, Bulgaria, Portugal). An Insurance Code, if enacted, would allow Polish lawmakers to remain the regional leaders in insurance legislation, setting directions and standards in the field.
- **ARGUMENT 5:** Normative consolidation of private laws governing insurance relations into a “code” seems to be the only and – at the same time – the optimal way to control the cur-

12. E.g. the Convention on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters, which binds Poland as from 1 January 2000 [Journal of Laws No. 10, item 132–133].

13. E. Kowalewski, “O potrzebie polskiego kodeksu ubezpieczeń,” [Dom Organizatora TNOiK Toruń 2009], 15–22.

rent normative chaos, which features the co-existence of **multiple legal regimes** dealing with insurance contracts (non-marine and marine insurance, voluntary and compulsory insurance, consumer and “non-consumer” insurance, commercial and mutual insurance, insurance guaranteed by the State Treasury and commercial, “non-guaranteed” insurance, and domestic and foreign market insurance). It seems that a way to address this peculiar multiplicity of legal regimes, which makes the law very difficult to apply, would be to establish general and universal provisions concerning insurance contracts (in the first part of the code), followed by special provisions on **individual forms and types of insurance contracts** set out in the subsequent parts of the code (titles, sub-titles, sections). Such a legislative approach would prevent unnecessary repetitions and allow the lawmakers to clearly determine the relationship between the special regulations and general provisions on insurance contracts, which are presumed to be universally applicable (see the methodology of the Code des Assurances).

- **ARGUMENT 6:** Developing a modern insurance law codification would create an excellent opportunity to free insurance law from certain archaisms and address its redundant traditionalism (visible e.g. in marine insurance regulations). Accordingly, the code should be based on the contemporary classification of insurance types (property insurance, personal insurance and liability insurance), and not on the currently used, incorrect systematics.
- **ARGUMENT 7:** An insurance code would be a fine opportunity to unify conflict of laws provisions concerning insurance contracts, a body of law known as the “private international law of insurance.” It also would be appropriate to extend these regulations to cover jurisdictional issues relating to insurance, including those concerning the enforcement of foreign court judgments, fully incorporating the Lugano Convention and Council Regulation No 44/2001. As regards private international law of insurance, the code should determine the relationship between the Polish Private International Law Act (which contains general provisions of private international law) and the relevant special private international law rules aligned with the EU law (in particular, the “Rome I” and “Rome II” Regulations). The code should also address overriding mandatory rules (the rules that must be applied regardless of the law applicable to the contract), which are becoming increasingly more relevant in international insurance relations, especially those involving compulsory insurance, and which restrict the autonomy of parties to exercise control over the choice of law.
- **ARGUMENT 8:** An insurance code would create an additional possibility to establish a detailed framework of **intertemporal rules** applicable to insurance relations and to determine intertemporal effectiveness of individual norms. It is particularly important to codify the intertemporal rules of insurance law because insurance relations are often of a continuous and long-lasting character (long-term insurance). A high degree of care must be exercised in any attempt to reform the legal regime governing such long-term relations and any changes need to follow clear legal principles, made known to contractual parties in advance.
- **ARGUMENT 9:** The development of a code, which is to regulate relations anchored in both public and private insurance law, will prevent too frequent amendments of insurance law and remove insurance law from the exclusive remit of the Ministry of Finance, transferring the relevant regulatory responsibilities to other government departments and bodies, in particular the Ministry of Justice and the Commission for the Codification of Private Law. Moreover, the parliamentary legislative process will ensure that any future amendments of the Insurance Code will follow a qualified legislative procedure require a special procedure to be adopted. This will guarantee

the high quality of subsequent legislative changes and ensure the necessary stability of law, preventing a floodgate of low-quality amendments.

- **ARGUMENT 10:** From the perspective of the social perception of law and its judicial and extra-judicial application, the creation of a clear, understandable, transparent and coherent, **code-based** legal framework for the entire field of insurance will contribute to the raising of national insurance awareness and lead to the elimination of the phenomenon of “**insurance ignorance**,” which has been present in Polish society for decades (and deplored by a doyen among the Polish insurance law academics¹⁴).

Conclusions

The present state of insurance law in Poland is highly unsatisfactory. Insurance law provisions are dispersed among a number of legal acts, and the regulation of the insurance contract is outdated. This creates extensive chaos, which manifests itself mainly in the lack of a clear distinction between the public and private spheres of insurance contract law. What is worse, laws governing the contract of insurance are scattered among the CC, the MC and other legal enactments; for example, the contract of compulsory insurance is regulated in the 2003 Compulsory Insurance Act, but also in the 2003 Insurance Activity Act.

The above shortcomings of Polish insurance law inevitably prompt a discussion about introducing a comprehensive codification of this branch of law in a single instrument – preferably an insurance code – which is a legislative model already adopted in France, Italy, Portugal or Bulgaria. This idea has been gaining increasingly more support in Poland, also among parliamentarians.

The future codification cannot be a partisan work of one or several, even most distinguished, authors. It should not strive to be original, but ought to draw on achievements and legal concepts developed by the legal doctrine and legislation of other countries, especially those with significant accomplishments in the field of insurance law.

References

- Łopuski J., and Kowalewski E., “Założenia legislacyjne dalszej reformy prawa ubezpieczeniowego,” *Państwo i Prawo* 11 [1991].
- Łopuski J., “Nowe prawo ubezpieczeniowe a ubezpieczenia morskie: refleksje na temat kierunków rozwoju prawa ubezpieczeniowego,” *Prawo Asekuracyjne* 3 [2004].
- Kowalewski E., “O potrzebie polskiego kodeksu ubezpieczeń,” Dom Organizatora TNOiK, Toruń 2009.
- Kowalewski E., “Prawo ubezpieczeń gospodarczych. Ewolucja i kierunki przemian”, Bydgoszcz 1992.
- Kowalewski E. “Propozycje zmian w ustawie o ubezpieczeniach majątkowych i osobowych,” Vol. XI of *Studia Ubezpieczeniowe*, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Warszawa–Poznań 1989.
- Kowalewski E., and Sangowski T., “Prawo ubezpieczeń gospodarczych. Komentarz,” Lexis Nexis, Warszawa 2004.

14. W. Warkało, “Prawo ubezpieczeniowe,” (PWN, Warszawa, 1983), 13.

Przewalska K., and Orlicki M., "Nowe prawo ubezpieczeń gospodarczych. Wprowadzenie," Oficyna Wydawnicza Branta, Bydgoszcz–Warszawa–Poznań 2004.

Rogowski S., ed. "Prawo ubezpieczeń. Ustawy z komentarzem," Poltext, Warszawa 2004.

Warkało. W., "Prawo ubezpieczeniowe," Państwowe Wydawnictwa Naukowe, Warszawa 1983.

Potrzeba wprowadzenia Kodeksu ubezpieczeniowego w Polsce

Dokonanie reform legislacyjnych w zakresie ubezpieczeń gospodarczych jest trudnym i złożonym zagadnieniem. Prawo ubezpieczeń gospodarczych jest częścią prawa ogólnego regulującą bardzo skomplikowaną i szeroką kwestię. Składają się na nią relacje cywilne w ubezpieczeniach, zagadnienia dotyczące prawa administracyjnego i finansowego w ubezpieczeniach oraz wszystkie problemy organizacyjne. Należy wspomnieć także o ubezpieczeniowym prawie karnym, rachunkowości ubezpieczeniowej, pośrednictwie ubezpieczeniowym i innych obszarach kontrolowanych przez państwo. Nawet pobieżne spojrzenie na relacje w prawie ubezpieczeń gospodarczych pokazuje, że błędną koncepcją, jeżeli nie anachroniczną, było uregulowanie tych wszystkich zagadnień w jednej ustawie, nawet jeśli miała możliwie najszerszy zakres i była uważnie przemyślana. Z uwagi na powyższe, istnieje potrzeba stworzenia porządku prawnego na obszarze ubezpieczeń gospodarczych, który będzie dotyczył jego niezbędnego przekształcenia w nowych warunkach ekonomicznych, oraz wyboru dla niego optymalnej koncepcji legislacyjnej.

Słowa kluczowe: przepisy ubezpieczeniowe, Kodeks ubezpieczeniowy, Polska.

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Insurance development as a factor in long-term economic growth

A substantial amount of theoretical and empirical literature suggests that, in addition to many other important factors, the long-term economic growth of a country is related to its level of financial development. According to theory, the channels through which financial development influences economic growth are the following: marginal productivity of capital, the saving-to-investment efficiency conversion, the saving rate, and technological innovation. The influence of economic growth is realized through the functions of financial intermediaries – the mobilization of savings, the reduction in the cost of capital through economies of scale and specialization, the provision of risk management and liquidity, the improvement of resource allocation. Insurance companies play a major role in these functions and thus should also play a major role in economic growth, as they are the main risk management resource for companies and individuals. Through the issuing of insurance policies they collect funds which are then transferred to deficit economic units for the financing of real investment. Therefore, according to the theory, the insurance sector is one of the factors contributing to economic growth.

This paper concerns the link between insurance development and economic growth theory, and discusses the possible contribution of insurance development to economic growth [using the theories of financial intermediation and endogenous growth as a basis]. It also presents a review of empirical studies on the insurance-growth nexus. The research results show that insurance development, as a part of financial development, provides a positive effect on long-term economic growth.

Key words: financial intermediation, financial development, insurance development, long-term economic growth, finance-insurance-growth-nexus theory.

Introduction

Economic growth is one of the most important economic categories. It determines the condition, and the tempo of change, of an economy. Economic growth and growth in productivity within an economy provide a number of economic benefits. They also provide the initial conditions for

social benefits, including improvements in the standard of living and social welfare. Understanding the mechanisms and sources of long-term economic growth is therefore very important from both the macro- and microeconomic point of view. Searching for long-term growth factors is one of the fundamental research problems related to contemporary economies. Many, sometimes very contrasting, concepts have emerged in the course of research in this field – one of them is financial (insurance) development as a factor in economic growth.

In economic literature there is an ongoing dispute over the importance of money and finance in the process of economic growth. This dispute arises from two opposing positions – the classical, which emphasizes the neutrality of money, and the Keynesian, which speaks of the active role of finance in economic growth. Both views have an important influence on the search and determination of the conditions that provide balanced economic growth, and on factors of long-term economic growth (on eliminating cyclical fluctuations).

At present, finance is developing very rapidly, not only as a scientific discipline but also in business practice. This has been due to many factors, including, in particular, globalization, deregulation of legislation, and the rapid development of the Internet and financial innovations. Currently, the more important dispute seems to concern how finance affects the economy, rather than whether it does so or not; the question here concerns to what extent it is an encouraging or disruptive factor within economic growth and development.

Contemporary finance is firstly considered a factor that contributes to economic growth, despite the short periods in which it is a distorting factor (for example, in a financial crisis). Many theories, studies and much empirical evidence have shown that countries with better-developed financial systems enjoy faster, more stable long-term growth. Well-developed financial intermediaries and financial markets have a significant positive impact on total factor productivity, which translates into higher long-run growth. Financial development contributes to an increase in the efficiency of the use of savings through investments, which in turn favours economic growth. The idea that a well-functioning financial system plays an essential role in promoting economic development dates back to J. Schumpeter, who argued that the services provided by financial intermediaries – mobilizing savings, evaluating projects, managing risk, monitoring managers and facilitating transactions – are essential for technological innovation and economic development.¹ R. Merton, using the 1956 Solow's model noted that "... in the absence of financial systems ... technical progress will not have significant and substantial impact on economic development and growth."² However, not every researcher has shared this view. Several economists remained of the view that finance is a relatively unimportant factor in economic development. This position is well represented by Joan Robinson, who contended that financial development simply follows economic growth ("where enterprise leads, finance follows").³ R. Lucas believed that economists attach too much significance to relations between financial factors and economic growth.⁴

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1. R. King and R. Levine, "Finance and growth: Schumpeter might be right," *The Quarterly Journal of Economics* 8 [1993]: 717.
 2. P. Haiss and K. Sumegi, "The Relationship of Insurance and Economic Growth – A Theoretical and Empirical Analysis," (paper presented at the 2006 EcoMod Conference, Hong Kong, June 28–30, 2006): 1.
 3. J. Robinson, "The Generalization of the General Theory," in *The Rate of Interest and other Essays*, (London 1952), 86.
 4. R. E. Lucas, "Wykłady z teorii wzrostu gospodarczego," (Warszawa: Wydawnictwo C. H. Beck, 2010), 34.

In today's economy, finance is very expansive and cash-flows are very intense. Some financial institutions and some segments of the financial market are not directly related to the funding of the real economy. They create a separate and constantly developing "world of finance," which is increasingly used to generate pure speculative profits. This development of the financial system has now become dangerous. This is reflected by numerous crises, both on local and global levels, that both threaten the economic system, and, partially, the social system too. Thus, an examination of the reliance between the processes occurring in the financial sphere and the real economy is still valid.

This study discusses possible contributions of insurance development to economic growth, based on the theories of financial intermediation and endogenous growth. The aim of the study is to present the scientific discussion – as it stands in current literature – concerning the interdependencies occurring between the development of finance and insurance, and economic growth [finance-insurance-growth nexus theory] as well as methods and results of empirical studies of this issue. The main research hypothesis is as follows: finance development and insurance development have a positive effect on long-term economic growth.

1. A theoretical approach to finance and economic growth

Economic growth is a measure of aggregate economic progress at a national level. It reflects the process of the year-to-year increase in the total value of goods and services produced in a domestic economy, as well as the income generated within it. The universal measure for the observation of the evolution of economic growth is the actual (real) Gross Domestic Product (GDP) per capita.⁵ Long-term economic growth is usually a gradual process in which the real GDP per capita grows at a rate of a few per cent per year.⁶ Economic growth is the result of various factors, the roles of which have changed. Historically, there are two main approaches to the typology of growth factors:

- classical and neo-classical theory (supply-side factors – long-term analysis);
- Keynesian theory (demand factors – an analysis of growth in the business cycle – short- and medium-term analysis).

The assumption of the relative isolation of the markets, according to which what happens to the money market does not influence the goods market, derives from the classical idea of an economy. According to classical theory, finance is neutral to the real economy. Money is merely a "voile" (veil) over the real economy. Finance is treated as secondary (as a "handmaid") in relation to the real sphere of economy. According to Walras' theory of general equilibrium, financial intermediaries can neither contribute to the acceleration nor to the slowdown of the growth-rate of an economy. There is no need for functioned intermediation in hypothetical ideal environments such as those in the models of Arrow and Debreu.⁷

5. Actual GDP eliminates the changes in the amount of the produced goods and services connected with price change (inflation results). Actual GDP per capita eliminates the effects connected with the change in population.

6. Between 1980 and 2007 the actual GDP per capita in the US increased on average by 2 per cent per year, in France by 1.5 per cent, in India and Ireland by 4.1 per cent, and in China by 8.7 per cent per year. P. Krugman, R. Wells, "Makroekonomia," (Warszawa: PWN, 2012), 131.

7. D.D. Hester, "On the theory of financial intermediation," *De Economist* 142(2) (1994): 133.

Neither Keynesian nor neoclassical growth models analyse finance and the financial sector as an economic growth factor, though such researchers as: J. Schumpeter, G. Gurley, S. Shaw, McKinnon, W. Goldsmith, and J. Hicks have substantiated the importance of an effective financial system to economic growth and development. R.I. McKinnon and E.S. Shaw, who adopted the Keynesian point of view, came to the conclusion that investments could not be realised if a sufficient amount of savings has not been previously accumulated in the form of bank deposits. This peculiar complementary relationship between financial capital and physical capital is only possible due to the functioning of financial intermediaries and shows the positive role played by finance in the process of economic growth. Finance promotes real investments and influences economic growth.⁸

In the 1980s, following P. Romer's model of 1986, a "new growth theory" came into being. This theory enabled the integration of finance with economic growth models. In Romer's model, income per capita in different countries may increase without limit, as the abilities of human innovation are unlimited and technology based on knowledge, as opposed to real capital, is not subject to the law of diminishing returns⁹. The endogenous nature of the model is based on the fact that the growth of human capital is due to investment in this capital – increasing a knowledge base results in the increased productivity of work and capital. According to Romer, technology (technical progress) is produced in the economy and determined by the intentional actions of both private and public sectors.

Endogenous growth models show that economic growth performance is related to financial development, technology and income distribution. Greenwood and Jovanovic (1990) argued that income per capita helps determine membership in an information-processing intermediary that in turn improves investment decisions and economic growth. They incorporated the role of financial factors in models of endogenous growth to formalise the interactions between financial markets and economic growth. Due to advances in the literature on endogenous growth, recent models have tried to identify the mechanism through which financial markets influence economic growth.¹⁰

According to the theory of financial intermediation, financial markets and financial intermediaries exist mainly because of the two types of market friction: transaction costs and asymmetric information. Economic theory suggests that markets and financial intermediaries promote economic growth as they help to overcome market frictions (fig. 1).

The reduction in transaction costs, as the main function of financial intermediaries, was first introduced by J.G. Gurley and E.S. Shaw. In their early studies they underlined the fact that financial intermediaries had an advantage over direct financing in economies of scale that resulted from shared costs.¹¹ Intermediaries collect funds and more efficiently transform them into investments than individual economic units do.

An alternative argument for the existence of financial intermediaries is that of information asymmetry, as was first suggested by Leland and Pyle in 1977. According to their theory, financial intermediaries are information collectors of borrowers' financial prospects *ex ante* and ad-

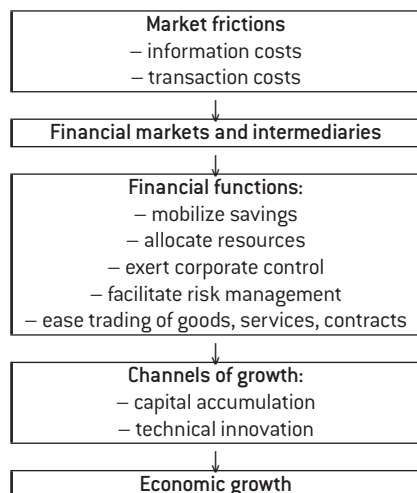
8. R.I. McKinnon, "Money and Capital in Economic Development," (Washington D.C., 1973).

9. P.M. Romer, "Increasing Returns and Long-Run Growth," *Journal of Political Economy* 94 (1986).

10. G.M. Coparale, P.G.A. Howells and A.M. Soliman, "Endogenous growth models and stock market development: Evidence from four countries," vol. 9 of *Review of Development Economics* 2 (2005): 166–176.

11. J.G. Gurley and E.S. Shaw, "Financial Intermediaries and the Saving-Investment Process," *The Journal of Finance* 11 (1956).

Figure 1. A theoretical approach to finance and growth



Source: R. Levine, "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature*, no. 35(2), 1997: 691.

dress the problem of adverse selection.¹² Diamond suggests that financial intermediaries act as delegated monitors to overcome the problem of ex-post asymmetric information, and in this way they reduce the problem of moral hazard.¹³ According to Allen and Santomero, the traditional theory of financial intermediation should also take into account the risk management activities of financial intermediaries and the reduction of participation costs.¹⁴ Recent literature emphasizes the role of financial intermediaries in improving the allocation of resources. Authors like Greenwood and Jovanovic, and also King and Levine, have developed financial models in which financial sector services contribute to economic growth.¹⁵ However, doubts have been raised with regard to this approach in the environments of less developed countries¹⁶.

According to the theory, the markets and financial institutions, including insurance companies, may contribute to economic growth in at least two ways: firstly, by supporting the accumulation of capital, which is a necessary condition in economic growth; and, secondly, through participation in increasing the technological innovations that lead to changes in the total productivity of productive factors. In developed countries, the financial markets and intermediaries have a direct effect on economic growth, mainly through their effect on capital allocation (the rate of investment) and on technological innovation. In endogenous models of economic growth, among them the models

12. H.E. Leland and D.H. Pyle, "Informational Asymmetries, Financial Structure and Financial Intermediation," vol. 32 of *The Journal of Finance* 2 (1977).

13. D. Diamond, "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies*, 51(3), <http://faculty.chicagobooth.edu>.

14. F. Allen and A. Santomero, "The theory of financial intermediation," vol. 21 of *Journal of Banking and Finance* 11-12 (1998): 1461–1485.

15. J.F. Outreville, "Financial development, human capital and political stability," *UNCTAD Discussion Papers* 142 (1999): 2.

16. R.E. Lucas, "Why doesn't capital flow from rich to poor countries?," vol. 80 of *American Economic Review* 2 (1990): 92–96.

by P. Romer,¹⁷ and P. Aghion and P. Howitt,¹⁸ there is an emphasis on the importance of implementing new technologies and pursuing a policy aimed at the development of industries based on knowledge and technology. The financial system is treated as one of the factors that favour the spread of technical knowledge and innovation. In countries with medium or low levels of development - where economic growth is still determined by work productivity and the rate of its growth - the financial system affects economic growth indirectly. Firstly, it influences capital accumulation and facilitates the inflow of foreign investment, especially direct foreign investment, which translates into the promotion of technological innovations and long-term economic growth.

Among financial intermediaries, insurance companies play an important role in the functioning of financial systems. They are the main risk management tool for companies and individuals. Through the issuing of insurance policies, they collect funds and transfer them to deficit economic units in order to finance real investment. Since insurance companies act as financial intermediaries, the same channels connect their function with economic growth. Therefore, according to the theory, the insurance sector is one of the factors contributing to the long-term economic growth.

The importance of the insurance industry in the economics of a country was already acknowledged as early as in 1964, at the first UNCTAD conference: *“a robustly national insurance and reinsurance sector represents an essential feature of a proper economic system, contributing to economic growth and fostering high employment”*¹⁹. In an integrated economic area such as the European Union, the contribution of member countries' insurance sectors to economic growth can be even more crucial. A low and uneven development of insurance, especially in the non-life insurance lines of business, increases the level of risk in the economic decisions taken by individuals and firms, hampering, in turn, economic activity. If insurance did not exist, a large proportion of the rest of the economy would not exist either. Without a reliable mechanism for mutualisation, pooling and transferring risk, a large portion of economic activity would simply not take place.²⁰

2. Insurance development and economic growth

Insurance development may be considered in at least two aspects. On the one hand it is seen as one of the main components of financial development, which is a part of economic growth (the concept resulting from J. Schumpeter's entrepreneur and innovation theory). On the other hand, because of the strong link between the insurance sector and other sectors of the economy, it is seen as one of the factors in long-term economic growth. At this point we will discuss financial development as a theoretical category – a broader concept than simply insurance development.

Financial development often appears in literature but it is seldom defined directly. According to the Polish dictionary the word “development” means the process of metamorphosis, changes in various areas consisting of the transition to a state or form more complex or in some respects

17. P.M. Romer, “Endogenous Technological Change,” vol. 98 of *The Journal of Political Economy* 5 (1990).

18. P. Aghion and P. Howitt, “Endogenous Growth Theory,” (The MIT Press. Cambridge Mass, 1999).

19. M. Kugler and R. Ofoghi, “Does Insurance Promote Economic Growth? Evidence from the UK,” (2005): 1, www.repec.org.

20. CEA, *The Contribution of the Insurance Sector to Economic Growth and Employment In the UE* (Brussels: CEA, 2006), www.cea.assur.org.

more perfect.²¹ Financial development, understood much more narrowly, is equated with the reduction of transaction costs connected with the conversion of non-liquid financial assets into liquid assets. As a result of the reduction of transaction costs, benefits are achieved by both units of capital surplus and units with a deficiency of capital. The volume of financial transactions also increases.²² According to another definition, transaction costs are a kind of loss in financial resources connected with the process of the transformation of savings into investments. Financial intermediaries and markets absorb a part of savings as cover for the costs of its current activities. The higher these costs are, the lower the efficiency of a financial system. This system develops only when it achieves economies of scale and can reduce the costs per saving unit. Thus, it contributes to the growth of the savings and investment rate.²³

According to Z. Bodie and R. Merton, finance effects economic growth through the functions of financial intermediaries. Financial development occurs when intermediaries and financial markets improve the implementation of five key functions:²⁴

- mobilising savings efficiently;
- allocating savings and resources to the appropriate investment projects;
- monitoring managers and promoting corporate control and governance;
- facilitating trading, hedging, pooling of risk, diversification and risk management; providing insurance services;
- facilitating the exchange of goods and services.

It can be said that the higher the level of financial development of a country, the more effective and efficient its financial intermediation and financial markets are. Firstly, greater financial development leads to the greater mobilization of savings and the allocation of these funds to the investment projects offering the highest return. The increased accumulation of capital enhances economic growth. Secondly, by appropriately allocating capital to the right investment projects and promoting sound corporate government, financial development increases the rate of technological innovation and productivity growth – this further enhances economic growth and welfare.

Insurance development is a part of financial development. It can be said that insurance development is a collection of terms.²⁵ While assessing the development of the insurance market, various changes, mostly historical in nature, that occur in this area are analysed.²⁶ In this study we accept the definition of insurance development (as analogous to financial development) as a long-term process of growth and improvement of the insurance market, institutions and instruments (qualitative changes), oriented to increase the effectiveness of their operations and increase

21. M. Szymczak, ed., "Słownik języka polskiego," (Warszawa: PWN, 1993), 123.

22. N. Roubini and X. Sala-i-Martin, "Financial Development, the Trade Regime, and Economic Growth," *NBER Working Paper* 3876 [1991].

23. M. Pagano, "Financial Markets and the Macroeconomy. Financial Markets and Growth. An Overview," *European Economic Review* 37 [1993]: 615.

24. R.C. Merton and Z. Bodie, "A Conceptual Framework for Analyzing the Financial Environment," in D. B. Crane et al., *The Global Financial System. A Functional Perspective* (Boston: Harvard Business School Press, 1995).

25. M. Osak, "O metodzie badania rozwoju prywatnych ubezpieczeń zdrowotnych," *Wiadomości Ubezpieczeniowe* 1 [2009]: 113–117.

26. J. Handschke, "Polskie doświadczenie w formowaniu i rozwoju rynku ubezpieczeń – wybrane aspekty," *Wiadomości Ubezpieczeniowe* 3 [2009]: 56–69.

the volume of insurance transactions [quantitative changes].²⁷ In practice, insurance development should occur through an increase in the number of insurance products, an improvement in their availability, and an increase in insurance premiums obtained by insurers.

Despite the prominence of financial and insurance development in discussions on economic growth, there is still surprisingly little agreement on how to measure this development. Financial development is generally identified with the growth of the real size of the financial sector and in relation to GDP, i.e. financial deepening. The traditional measures of financial development and deepening are quantity indicators based on monetary and credit aggregates. The simplest indicator is the money/GDP ratio, which measures the degree of monetization in the economy. The ratio M2/GDP measures the overall size of the financial intermediary sector and is strongly correlated with both the level and the rate of change of the real GDP per capita.²⁸

R. King and R. Levine constructed several indicators of financial development designed to measure the services provided by financial intermediaries. The first such indicator is the traditional measure of financial depth, which equals the overall size of the formal financial intermediary system, i.e., the ratio of liquid liabilities to GDP. The second indicator is the importance of deposit banks relative to the central bank in allocating domestic credit. The third indicator is credit issued to nonfinancial private firms divided by total credit and credit issued to nonfinancial private firms divided by GDP.²⁹ T. Beck, A. Demirgüç-Kunt and R. Levine used the following indicators, among others: ratio of financial institutions' assets to total assets of financial system, and ratio of financial institutions assets to GDP.³⁰

One of the simplest indicators of financial development, the most commonly used in practice, is the ratio percentage of loans and credit granted by the banking sector to GDP. However, the assessment of financial development only on the basis of this factor is currently not sufficient, since this indicator does not account for the development of out of bank financial institutions, nor does it say anything about the quality of financial services, the efficiency of the financial sector, or its stability.

In 2008 the World Economic Forum undertook a research initiative aimed at providing business leaders and policymakers with a common framework to identify and discuss the key factors in the development of the global financial systems and markets³¹. For the purposes of the Financial Development Index (FDI), financial development was defined as the factors, policies and institutions that lead to effective financial intermediation in markets, and deep and broad access to capital and financial services. Financial development is measured by factors such as size, depth, access, efficiency and the stability of a financial system, including its markets, intermediaries, range of assets, institutions and regulations³². One of the components of this index is insurance development, measured by the following indicators: {1} *Life and Non-life insurance penetration* – insurance premium per capita, which measures the activity of insurers as financial intermediaries; {2} *Real*

27. J. Kulawik, "Rozwój finansowy a wzrost i rozwój ekonomiczny," *Bank i Kredyt* 1–2 (1998): 31–32.

28. J. F. Outreville, "Financial development," 1–2.

29. King R. and R. Levine, "Finance and growth: Schumpeter might be right", *The Quarterly Journal of Economics* 8 (1993): 718.

30. T. Beck, A. Demirgüç-Kunt and R. Levine, "A New Database on Financial Development and Structure," *Financial Sector Discussion Paper 2* (The World Bank, 1999).

31. The World Economic Forum has issued four editions of a report on the financial growth of about 60 countries around the world, *The Financial Development Report* 2008, 2009, 2010, 2011, 2012.

32. World Economic Forum, *The Financial Development Report* 2008, 3.

growth of direct insurance premiums, (3) *Life and Non-life insurance density* – relative insurance premiums to GDP, which measures the relative meaning of the insurance sector in an economy (4) *Relative value added by insurance to GDP*, which measures the contribution of the insurance sector in the development of GDP.

Table 1. Selected data from the ranking of countries in terms of financial development between 2008–2012

Specification	2008 rank (1 to 55)	2009 rank (1 to 55)	2010 rank (1 to 57)	2011 rank (1 to 60)	2012 rank (1 to 62)	2012 score (1–7)
United Kingdom	2	1	2	3	3	5,21
Australia	11	2	5	5	5	5,01
United States	1	3	1	2	2	5,27
Singapore	10	4	3	4	4	5,10
Hong Kong	8	5	4	1	1	5,31
Canada	5	6	6	6	6	5,01
Switzerland	7	7	8	9	8	4,71
Netherlands	9	8	7	7	9	4,78
Japan	4	9	9	8	7	4,90
Denmark	.	10	16	15	12	4,53
...
Poland	41	39	35	33	37	3,4
...
Ukraine	51	53	53	54	59	2,56
Bangladesh	.	54	56	56	57	2,62
Venezuela	52	55	55	59	62	2,37

Source: own study based on: *The Financial Development Report 2008, 2009, 2010, 2011, 2012*, World Economic Forum, Geneva, Switzerland.

Table 2. Polish ranking of insurance development factors, 2009–2012

Specification	2008 rank (1 to 55)	2009 rank (1 to 55)	2010 rank (1 to 57)	2011 rank (1 to 60)	2012 rank (1 to 62)
Non-banking financial services	43	43	27	21	20
Insurance	27	29	21	36	39
Insurance premiums direct	26	27	.	.	.
Life insurance coverage	.	.	20	20	.
Non-life insurance coverage	.	.	25	26	.
Insurance density	27	28	.	.	.
Insurance penetration	26	27	.	.	.
Life insurance penetration	.	.	.	.	31
Non-life insurance penetration	.	.	.	.	30
Real growth of direct insurance premiums	5	16	2	32	33
Life insurance density	.	.	29	30	23
Non-life insurance density	.	.	32	30	27
Relative value-added of insurance to GDP	45	21	29	36	37

Source: own study based on: *The Financial Development Report 2008, 2009, 2010, 2011, 2012*, World Economic Forum, Geneva, Switzerland.

The analysis of the financial development summarized in Table 1 allows some conclusions to be drawn. First of all, the US economy was the most financially developed only in the years 2008 and 2010. In 2009 the USA lost its leading position to the United Kingdom, and, for the years 2011–2012, to Hong Kong. Secondly, Poland, in terms of financial development, moved from place 41 in 2008 to place 33 in 2011, then dropped to place 37 in 2012. Thirdly, the worst developed financial systems are in the economies of Ukraine, Bangladesh and Venezuela. These countries were at the bottom of the rankings throughout the examined period. Lastly, between 2008–2010 Poland was ranked much higher in terms of insurance development than financial development (Tables 1 and 2).

The recent crisis has, however, raised concerns that some countries may have financial systems that are “too large” compared to the size of their domestic economy. It is noteworthy that over the last three decades the US financial sector grew six times faster than nominal GDP.³³ This has led to a situation in which finances, “instead of being a servant” of the economy, have become the “economy’s master.”³⁴ This process is called financialization, and reflects the fact that the financial markets, financial institutions, and financial elites gain greater influence over economic policy and economic outcomes.³⁵ It may be asked whether it is correct that there is such a clear domination of financial markets over the traditional industrial economy. Where are the safe limits of financial development?

The idea that there may be a threshold above which financial development hits negative social returns is hardly new. As early as the 1970s, Minsky and Kindleberger emphasised the relationship between finance and macroeconomic volatility. H. Minsky wrote extensively about financial instability and financial manias.³⁶ Contemporary discussions suggest that the danger of financial development is that the presence of a large and complicated financial system has increased the likelihood of a “catastrophic meltdown” and some financial innovations can increase financial fragility, even in the absence of leverage.³⁷ When they wrote this, financial markets were much smaller than nowadays – the finance and insurance sectors made only 7.5 per cent profit after tax, whereas recently this figure has been between 30 and 80 per cent. So, what are the limits of financial development? Many results show that the marginal effect of financial development on output growth becomes negative when credit to the private sector surpasses 110 per cent of GDP.³⁸ On the basis of the World Bank’s publications it can be concluded that in 18 countries (out of the 200 examined) this rate is higher than 110 per cent (cf. Table 3), and the rates of France and Germany are just under this threshold, at 109.1 per cent.

We conclude that the size of the financial sector played an important role in amplifying the effects of the global recession that followed the collapse of Lehman Brothers in September 2008. While most of the recent discussion on the negative effects of financial development concentrates

33. R.G. Rajan, “Has financial development made the world riskier?,” *Working Paper* 11728 (2005), accessed October 21, 2013, www.nber.org/papers/w11728.pdf

34. J.L. Arcand, E. Berkes and U. Panizza, “Too much finance?,” (2011), accessed October 21, 2013, www.voxeu.org/article/has-finance-gone-too-far.

35. T. I. Palley, “Financialization: What It Is and Why It Matters,” *Working Paper* 525 (2007): 2.

36. H.P. Minsky, “The financial Instability Hypothesis,” *Working Paper* 74 (1992): 2.

37. N. Roubini and S. Mihm, “Ekonomia kryzysu,” (Warszawa: Wydawnictwo Oficyna a Wolters Kluwer Business, 2011), 73–74.

38. J.L. Arcand, E. Berkes and U. Panizza, “Too much finance?.”

on advanced economies, during the recent crisis the amplifying role of the financial sector was also important for developing countries.

Empirical studies on new factors of economic growth were intensified only in the 1990s. At that time, the pioneering studies by J. Schumpeter were more often referred to. With reference to models of endogenous growth, a number of attempts were made to study how economic growth was influenced not only by financial development but also by many other non-conventional factors of growth.³⁹ Empirical studies were carried out using econometric regression models with a panel [cross-country, time series] dataset.

Table 3. Countries and their private credit to GDP (%), averages, 2008–2010

Countries	Private credit to GDP (%)	Countries	Private credit to GDP (%)	Countries	Private credit to GDP (%)
Australia	124,4	Iceland	137,5	Portugal	179,0
Austria	120,5	Ireland	228,2	San Marino	361,7
Canada	126,6	Luxembourg	184,0	Spain	203,7
Cyprus	265,6	Malta	127,6	Sweden	124,3
Denmark	208,1	Netherlands	201,9	Switzerland	169,6
Hong-Kong	152,9	New Zealand	145,0	United Kingdom	205,3

Source: own study based on: *Global Financial Development Report 2013, Rethinking the Role of the State in Finance* (Washington, D.C.: The World Bank), 161–166.

The role of the financial sector in economic growth has become a major topic of empirical research in the last two decades, and the seminal work of R. King and R. Levine has been greatly elaborated. On the basis of empirical studies (using data on 80 countries over the 1960–1989 period) R. King and R. Levine have found that the predetermined component of financial development is a good predictor of long-run growth over the next 10 to 30 years. These results suggest an important link between financial development and long-run growth, as suggested by Schumpeter 80 years ago.⁴⁰ Some further evidence in this direction has been provided e.g., by the work of Wachtel and Rousseau. With the use of the Granger causality test⁴¹ for a number of time series, Wachtel and Rousseau confirmed the reliance which exists between financial development and economic growth. An impressive number of empirical studies relying on large country samples from the 1960s to the 1980s show that financial development can have an economically important impact on growth.⁴² Many studies concern the relationship between the development of the banking sector and capital market, and economic growth. The role of insurance companies, although growing in importance in financial intermediation, has received less attention than bank and stock market..

39. M. Próchniak, "Czynniki wzrostu gospodarczego – wyniki z badań empirycznych," *Ekonomista* 3 (2006): 305–339.

40. R. King and R. Levine, "Finance and growth: Schumpeter might be right," *The Quarterly Journal of Economics* 8 (1993): 719.

41. The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, cf. C.W.J. Granger, "Investigating Causal Relations by Econometric Models and Cross-spectral Methods," *Econometrica*, no. 37 (3) (1969). Ordinarily, regressions reflect "mere" correlations, but C. Granger argued that causality in economics could be reflected by measuring the ability of predicting the future values of a time series using past values of another time series. Since the question of causality is deeply philosophical, econometricians assert that the Granger test finds only "predictive causality."

42. P. Haiss and H. Sumegi, "The Relationship of Insurance."

Analogously to other financial sectors, the link between insurance development and the real sector can be classified in terms of causality, with respect to five possible hypotheses. The first – no causal relation. The second – demand-following, e.g., economic growth leads to the rise in demand for insurance [the faster the economic growth, the higher the demand for insurance services and insurance development]. The third – supply-leading, e.g., growth in insurance smoothes short-term economic volatility and thus induces economic growth in the long term; also, an increase in investment by insurance companies induces economic growth. The fourth – a negative causal link from insurance to growth, e.g., increasing insurance causes more reckless behaviour (“moral hazard”), which results in a less efficient and more volatile economy. The fifth – interdependence.⁴³ Empirical evidence in the literature on the subject suggests that developing countries have a rather supply-leading causality pattern of development, and less of a demand-following pattern⁴⁴. Empirical studies suggest that non-life insurance contributes to growth in countries at many different levels of development. Life insurance makes a substantial contribution to growth mostly in wealthier countries, since life insurance is typically a smaller part of the total insurance market in low-income countries⁴⁵.

Empirical studies concerning the connection between insurance development and economic growth are mainly carried out on the basis of time-cross-sectional data derived from developed and developing countries. Only a few studies have been conducted on the basis of time series of single countries [these include: the United Kingdom, Sweden, Singapore, Malaysia and Poland]. The results of this research are presented in Table 4. The methods used in this research can be divided into three groups: correlation and regression analysis; analysis of time series co-integration; and causality tests. The cognitive studies which examined the cause-and-effect relationships between the variables (usually the values of premiums and GDP) are of particular importance. One of the methods for determining the direction of these relationships is the Granger causality test. A summary of the empirical studies on the relationship between insurance growth and economic growth is made below.

Table 4. Empirical research on the relationship between insurance growth and economic growth in 2000–2010

Autors	Year	Sample coverage region	Sample coverage time	dependent variable	explanatory variable	Methodology
Ward, Zurbrugg	2000	9 OECD countries	1961–1996	total insurance premiums, real GDP	real GDP, total real insurance premiums,	bivariate VAR, Granger equations-causality tests
Webb, Grace, Skipper	2002	55 countries, include 17 UE countries	1980–1996	Life and P&L insurance premiums in % of GDP, bank credit	GDP, GDP <i>per capita</i>	OLS on panel data and cross-country for bidirectional model
Kugler, Ofoghi	2005	United Kingdom	1966–2003	Life and P&L insurance premiums	real GDP	Johansen's cointegration test and Granger equations

43. Ibidem, 4–5.

44. J.F. Outreville, “Financial development,” 2.

45. L. Brainard and B.L. Schwartz, “What is the role of insurance in economic development?,” [Zurich: Zurich Government and Industry Affairs, 2008], http://www.zurich.com/internet/main/sitecollectiondocuments/insight/what_is_the_role_of_economic_development.pdf.

Autors	Year	Sample coverage region	Sample coverage time	dependent variable	explanatory variable	Methodology
Arena	2006	56 countries	1976–2004	Life and P&L insurance premiums to GDP	real GDP <i>per capita</i>	GMM dynamic panel estimations
Haiss, Sümegi	2006	29 European – mainly EU – countries	1992–2004	written insurance premium	real GDP per employed	OLS for panel data, test for Granger causality
Haiss, Sümegi	2008	29 European – mainly EU – countries	1992–2005	insurance premiums, investment of insurance companies	real GDP, GDP per employed	OLS, Granger causality test, modified Cobb-Douglas production function
Čurak, Lončar, Poposki	2009	10 countries new to the EU	1992–2007	Life and P&L insurance premiums to GDP	GDP <i>per capita</i>	OLS and 2SLS estimations for panel data
Njegomir, Stojić	2010	Countries of the ex-Yugoslavia Region	2004–2008	gross premium written <i>per capita</i> , technical reserves	real GDP <i>per capita</i>	OLS for panel data
Han, Li, Mo-shirian, Tian	2010	77 countries – global insurance sector	1994–2005	insurance premiums <i>per capita</i>	real GDP <i>per capita</i>	GMM dynamic panel estimations for panel data
Ortyński	2010	Poland	1994–2008	real total premiums, real premium of life insurance, real premium of non-life insurance	real GDP	GLS
Bednarczyk	2012	Poland	1995–2009	total, life and non-life insurance premiums <i>per capita</i>	real GDP <i>per capita</i>	OLS, VAR, Johansen's cointegration test, test for Granger causality

GMM – Generalized Method of Moments, GLS – Generalized Least Square, OLS – Ordinary Least Square, 2SLS – Two Stage Least Squares

Source: T.H. Bednarczyk, "Działalność sektora ubezpieczeniowego a wzrost gospodarczy," in *Ubezpieczenia wobec wyzwań XXI wieku* (Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, no. 228, 2011), 26.

Work by D. Ward and R. Zurbruegg is considered the first study to examine the potential relationship between the growth in insurance activity and economic growth for nine OECD countries. They used the total number of written insurance premiums as the definition of insurance activities. The results were varied. Causality tests from vector autoregressions in levels show that insurance activity leads economic growth only in Canada and Japan. In Italy there is a bidirectional relationship. For all other countries, including the United Kingdom, the USA, Austria and Switzerland, there is no evidence of the interaction. Ward and Zurbruegg conclude that the causal relationships between insurance and economic growth might well vary across countries. This is due to the influence of different country-specific factors, including cultural, regulatory and legal ones.⁴⁶ Conclusions regarding the causality relationships are as follows: there is a reliance of a supply-leading type in some countries, while there are no significant causality links in others.

M. Kugler and R. Ofoghi examine the long-term relationship between the size of the insurance market and economic growth in the United Kingdom. Insurance development was measured by dis-

46. D. Ward and R. Zurbruegg, "Does Insurance Promote Economic Growth? Evidence from OECD. Countries," *The Journal of Risk and Insurance* 4 (2000).

aggregated insurance premiums for different classes of property insurance (marine-aviation insurance, transport insurance and reinsurance). Using Johansen's cointegration tests, M. Kugler and R. Ofoghi find a long-term relationship between the development in the size of an insurance market and the economic growth for all components of insurance markets. The results show that for most cases there is a bilateral long-term relationship between the development of the size of an insurance market and economic growth, rather than a cyclical effect.⁴⁷ Conclusions regarding a causality link: causality runs in both directions.

M. Arena provides a systematic assessment of the impact of insurance market activity (life and non-life insurance) on economic growth. M. Arena found robust evidence of a causal relationship between insurance market activity and economic growth. Both life and non-life insurance premiums have a positive and significant causal effect on economic growth, but life insurance is, according to Granger, the cause of economic growth in high-income countries only, and, while the impact of the development of non-life insurance has been confirmed in both developing and developed countries, it is greater in developed countries than in developing ones.⁴⁸ Conclusions regarding a causality link: supply-leading, both in life and non-life sectors. Life insurance is more important for high-income countries.

P. Haiss and K. Sumegi examine in their work whether, and how, insurance influences economic growth. They analyse the various channels of influence of the insurance sector vis-a-vis economic growth: risk transfer, substitute savings, investment, and possible sources of contagion and repercussions to the economy. They note that the transfer of risk to the insurer stabilizes income streams of business entities, dampens volatility and enhances economic activity. Both increasing the value, and also expanding the area of financial investment and also deepening capital markets have a positive effect on economic growth. In empirical studies P. Haiss and K. Sumegi developed a modified production function to empirically investigate the endogenous insurance-growth model. The research by P. Haiss and K. Sumegi produced mixed results. Their results show no evidence of a correlation between aggregate insurance premium income and GDP growth. A rather weak correlation between the growth in the banking sector, the capital market, and economic growth has been defined. However, strong evidence of the impact of life insurance on economic growth has been found.⁴⁹

In another study, P. Haiss and K. Sumegi investigate both the impact of insurance investments and premiums life and non-life segments on GDP growth in Europe. Using premium income and insurance investment they provided evidence of a correlation between investments and GDP growth for EU-15 countries along with Norway, Switzerland and Iceland, (with mature financial markets) and a short-term connection between expenditure on non-life insurance and the GDP for the emerging-market-type countries (new EU member states from Central and Eastern Europe). Furthermore, their findings emphasise the impact of the real interest rate and the level of economic development for the insurance-growth-nexus. They argue that the insurance sector needs to be paid more attention in financial sector analysis and macroeconomic policy.⁵⁰ Conclusions regard-

47. M. Kugler and R. Ofoghi, "Does Insurance Promote."

48. Marco Arena, *Does "Insurance Market Activity Promote economic Growth? A Cross-Country Study for Industrialized and Developing Countries,"* [The World Bank 2006].

49. P. Haiss and K. Sumegi, "The Relationship of Insurance and Economic Growth – A Theoretical and Empirical Analysis," [paper presented at the EcoMod conference, Hong Kong, 2006].

50. P. Haiss and K. Sumegi, "The Relationship Between Insurance and Economic Growth in Europe – A Theoretical and Empirical Analysis," vol. 35 of *Empirica* 4 [2008].

ing a causality link: supply-leading. Life insurance is more important for high-income countries and non-life is more important for emerging EU countries.

Webb, Grace and Skipper examine banks, life and non-life insurers. In particular, they examine how banks and insurers, individually and together, contribute to economic growth by increasing effective capital allocation. They use a Solow-Swan model for this purpose. Their findings indicate that financial intermediaries are significant. It turns out that a synergy exists between banks and insurers. Furthermore, results show that a combination of banking and one insurance type has the strongest impact on growth.⁵¹ Conclusions regarding a causality link: supply-leading and increased productivity over the period. Also, finding a synergy between banks and insurers would involve adding together their individual contributions. Additionally, economic development was found here.

When analysing the results of empirical studies, it should be emphasised that most of them concern highly-developed or developing economies. There is incredibly little research concerning transforming countries. The results of the little research that has been conducted there have shown that the development of insurance has a statistically crucial impact on economic growth in those countries. It is worth noting the studies carried out by V. Njegomir and D. Stojic concern the countries of the former Yugoslavia,⁵² and studies by K. Ortyński and T. H. Bednarczyk concern Poland. The results of Ortyński show that there is a positive and statistically important relationship between the development of the insurance market and economic growth in Poland. A particularly strong relationship was observed between the development of the non-life insurance market and the value of the real GDP.⁵³ Conclusions regarding a causality link: Granger causality has not been investigated.

The author of this paper, T. H. Bednarczyk, examined in her previous work the long-term relationship between insurance development and economic growth in Poland. Empirical studies used secondary data for the years 1995–2009, on a quarterly basis. Insurance development is measured by the growth-rate of insurance density (quarterly insurance premiums per capita); and the economic growth by the growth-rate of the quarterly GDP per capita. Three different insurance variables were used – life insurance premium per capita, non-life insurance premium per capita, and total insurance premium per capita. Econometrics tests were used for cointegration and Granger causality. The estimation method used the Ordinary Least Square (OLS) for time series, with data on a quarterly basis. Using Johansen's cointegration tests and the Engle-Granger procedure, the author finds a long-term relationship between insurance development and economic growth. Both methods gave similar results. There was no causality proven by the Granger causality test.⁵⁴ Conclusions regarding a causality link: no significant causality links in Poland.

51. I. Webb, M. F. Grace and H. Skipper, "The Effect of Banking and Insurance on the Growth of Capital and Output," *Center for Risk Management and Insurance Working Paper* 02–1 (2002).

52. V. Njegomir and D. Stojic, "Does Insurance Promote Economic Growth: The Evidence from Ex-Yugoslavia Region," *Ekonomika, Misao i Praksa* 1 (Dubrownik, 2010): 31–48.

53. K. Ortyński, "Ubezpieczenia a wzrost gospodarczy w Polsce," in *Globalizacja i integracja regionalna a wzrost gospodarczy*, ed. S. I. Bukowski, (Warszawa: CeDeWu, 2010), 174.

54. T. H. Bednarczyk, "Wpływ działalności sektora ubezpieczeniowego na wzrost gospodarczy," (Lublin: Wydawnictwo UMCS, 2012).

Conclusions

The main intention of this study was to examine the link between financial development, insurance development and economic growth [the insurance-finance-growth nexus], which is an important issue that has only relatively recently become the subject of wider interest. Previously, the dominant opinions were that there was a neutral role played by money and the financial system in the economy, or that economic growth had a stronger impact on financial development. Today, it is believed that a well-developed financial system increases the efficiency of financial decisions, and improves the allocation of resources in the economy, which thus promotes economic growth.

The review of literature, mainly in English, leads to the conclusion that financial development encourages long-term economic growth, despite the fact that in the short-term it can bring about economic recession due to financial crises. The literature describes a large amount of empirical research that shows that financial development has a positive influence on economic growth. As far as insurance is concerned, it should be noted that in recent decades its importance has grown in economies, mainly due to the liberalization of financial systems, globalization and the conglomeration of financial markets. The role of the insurance sector and its contribution to economic growth is appreciated not only by scientific communities, but also by major international organizations such as UNCTAD, the World Bank, and the International Monetary Fund.

A large part of the theoretical literature emphasises many benefits of insurance to the economy and society. Insurance activity enhances the financial stability of families and businesses; it also facilitates competitiveness and the development of trade and commerce by enhancing creditworthiness and lowering the total necessary amount and cost of capital, and also by reducing total risk - this enables enterprises to enter new business ventures and take additional risk. Insurance activity substitutes and complements public sector expenditure on security programmes, facilitates loss prevention either directly by investing in loss prevention programmes such as medical research, fire prevention or highway safety, or indirectly by tying premiums to loss experience. Insurers, in addition to primary functions, i.e. providers of risk transfer and indemnification, serve the same types of functions as other financial intermediaries. The development of insurance contributes to economic growth in several ways: by increasing liquidity and the availability of total capital stock in an economy, as well as the efficiency of capital allocation. In addition, empirical evidence from developed economies shows that insurers are among the major employers and investors. Thus, they may have a positive impact on important factors of economic growth, such as: private savings rates, the percentage of savings directed towards investments, the marginal productivity of investment. Their activity, like that of banks, may create growth in the economy. The channels of impact of the development of insurance on economic growth are as follows: increasing the total productivity of productive factors (this is more typical for developed countries than for developing ones) and capital accumulation, and also facilitating the inflow of foreign investment that promotes the development of technical innovation. This channel is more frequently used in countries with low and medium levels of prosperity.

It is possible to conclude that there is good theoretical justification for insurance development influencing economic growth (and vice-versa). While there are strong theoretical explanations for the positive impact of insurance on economic growth, empirical evidence is rather scarce – only a few studies devoted empirical research to the insurance-growth nexus. The predominant

methodology for searching for correlation and cointegration to calculate dependency factors is to implement an ordinary least square model on a cross-sectional data set and to test causality [Granger causality test]. The results of empirical research carried out to date are mixed. There are differences between less developed countries and countries with mature financial markets. Generally, we can say that the results of empirical studies have provided evidence proving that the development of insurance plays a positive role in optimizing the allocation of physical resources and thus indirectly affects economic growth, although not equally so in all the countries studied. Given the huge body of research on the relationship between bank/capital market – finance and economic growth, there is definitely a need for more empirical work on the insurance-growth nexus.

References

- Aghion P., and Howitt P., "Endogenous Growth Theory," The MIT Press. Cambridge Mass, 1999.
- Allen F., and Santomero A., "The theory of financial intermediation," Vol. 21 of *Journal of Banking and Finance* 11–12 [1998].
- Arcand J. L., Berkes E., and Panizza U., "Too much finance?," Accessed October 21, 2013. www.voxeu.org/article/has-finance-gone-too-far.
- Arena, Marco, "Does Insurance Market Activity Promote Economic Growth? A Cross-Country Study for Industrialized and Developing Countries," The World Bank, 2006.
- Beck T., Demirgüç-Kunt A. and Levine R., "A New Database on Financial Development and Structure," Financial Sector Discussion Paper 2 [1999].
- Bednarczyk T. H., "Wpływ działalności sektora ubezpieczeniowego na wzrost gospodarczy," Lublin: Wydawnictwo UMCS, 2012.
- Bednarczyk T. H., "Działalność sektora ubezpieczeniowego a wzrost gospodarczy," in *Ubezpieczenia wobec wyzwań XXI wieku*, edited by W. Ronka-Chmielowiec, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu* 228 [2011].
- Brainard, L., and Schwartz B. L., "What is the role of insurance in economic development?," Zurich: Zurich Government and Industry Affairs, 2008. http://www.zurich.com/internet/main/sitecollectiondocuments/insight/what_is_the_role_of_economic_development.pdf
- Coparale G. M., Howells P. G. A. and Soliman A. M., "Endogenous growth models and stock market development: Evidence from four countries," Vol. 9 of *Review of Development Economics* 2 [2005].
- Diamond D., "Financial Intermediation and Delegated Monitoring," Vol. 51 of *Review of Economic Studies* 3 [1984].
- The World Bank, "Global Financial Development Report 2013 Rethinking the Role of the State in Finance", Washington, D.C.: The World Bank, 2013.
- Granger, C. W. J., "Investigating Causal Relations by Econometric Models and Cross-spectral Methods," *Econometrica* 37 [3] [1969].
- Gurley, J. G., and Shaw E. S., "Financial Intermediaries and the Saving-Investment Process," *The Journal of Finance* 11 [1956].
- Haiss P., and Sumegi K., "The Relationship of Insurance and Economic Growth – A Theoretical and Empirical Analysis," Paper presented at the EcoMod Conference, Hong Kong, June 28–30, 2006.
- Haiss P., and Sumegi K., "The Relationship Between Insurance and Economic Growth in Europe – A Theoretical and Empirical Analysis," Vol. 35 of *Empirica* 04 [2008].

- Handschke J. "Polskie doświadczenie w formowaniu i rozwoju rynku ubezpieczeń – wybrane aspekty," *Wiadomości Ubezpieczeniowe* 3 [2009].
- Hester D.D., "On the theory of financial intermediation," *De Economist* 142(2) [1994].
- King R., and Levine R., "Finance and growth: Schumpeter might be right," *The Quarterly Journal of Economics* 8 [1993].
- Krugman, P., and Wells R., "Makroekonomia," Warszawa: PWN, 2012.
- Kugler M., and Ofoghi R., "Does Insurance Promote Economic Growth? Evidence from the UK," [2005]. www.repec.org.
- Kulawik J., "Rozwój finansowy a wzrost i rozwój ekonomiczny," *Bank i Kredyt* 1–2 [1998].
- Leland H. E., and Pyle D. H., "Informational Asymmetries, Financial Structure and Financial Intermediation," Vol. 32 of *The Journal of Finance*, 2 [1977].
- Levine R. "Financial Development and Economic Growth: Views and Agenda," *Journal of Economic Literature* 35(2) [1997]: 691.
- Lucas R. E. "Why doesn't capital flow from rich to poor countries?," Vol. 80 of *American Economic Review* 2 [1990].
- Lucas, R. E., "Wykłady z teorii wzrostu gospodarczego," Warszawa: Wydawnictwo C. H. Beck, 2010.
- McKinnon R. I., "Money and Capital in Economic Development," Washington D.C.: The Brookings Institution, 1973.
- Merton R. C., and Bodie Z., "A Conceptual Framework for Analyzing the Financial Environment," in Crane D.B., Froot K.A., Mason S.P., Perold A.F., Merton R.C., Bodie Z., Sirri E.R., and Tufano P., *The Global Financial System. A Functional Perspective*. Boston: Harvard Business School Press, 1995.
- Minsky H. P., "The financial Instability Hypothesis." *Working Paper* 74 [1992].
- Njegomir V., and Stojić D., "Does Insurance Promote Economic Growth: The Evidence from Ex-Yugoslavia Region," *Ekonska, Misao i Praksa* 1 [2010].
- Ortyński K., "Ubezpieczenia a wzrost gospodarczy w Polsce," in *Globalizacja i integracja regionalna a wzrost gospodarczy*, edited by S. I. Bukowski, Warszawa: CeDeWu, 2010.
- Osak M., "O metodzie badania rozwoju prywatnych ubezpieczeń zdrowotnych," *Wiadomości Ubezpieczeniowe* 1 [2009].
- Outreville J. F. "Financial development, human capital and political stability," *UNCTAD Discussion Papers* 142 [1999].
- Pagano M., "Financial Markets and the Macroeconomy. Financial Markets and Growth. An Overview," *European Economic Review* 37 [1993].
- Palley T. I., "Financialization: What It Is and Why It Matters," *Working Paper* 525 [2007].
- Próchniak, M., "Czynniki wzrostu gospodarczego – wyniki z badań empirycznych," *Ekonomista* 3 [2006].
- Rajan R. G., "Has financial development made the world riskier?," *Working Paper* 11728 [2005]. Accessed October 21, 2013, www.nber.org/papers/w11728.pdf.
- Robinson J., "The Generalization of the General Theory," in *The Rate of Interest and other Essays*. London: Macmillan, 1952.
- Romer P. M., "Endogenous Technological Change," Vol. 98 of *The Journal of Political Economy* 5 [1990].
- Romer P. M., "Increasing Returns and Long-Run Growth," *Journal of Political Economy* 94 [1986].
- Roubini N., and Mihm S., "Ekonomia kryzysu," Warszawa: Wydawnictwo Oficyna a Wolters Kluwer Business, 2011.
- Roubini N., and Sala-i-Martin X., "Financial Development, the Trade Regime, and Economic Growth," *NBER Working Paper* 3876 [1991].

- Szymczak M., ed., "Słownik języka polskiego," Warszawa: PWN, 1993.
- CEA, "The Contribution of the Insurance Sector to Economic Growth and Employment In the UE," Brussels: CEA, 2006. www.cea.assur.org
- World Economic Forum, Geneva, Switzerland. *The Financial Development Report 2008, 2009, 2010, 2011, 2012*. New York: World Economic Forum USA Inc, 2008–2012.
- Ward, D., and Zurbruegg R., "Does Insurance Promote Economic Growth? Evidence from OECD Countries." *The Journal of Risk and Insurance* 4 (2000).
- Webb I., Grace M. F., and Skipper H., "The Effect of Banking and Insurance on the Growth of Capital and Output," *Center for Risk Management and Insurance Working Paper*, 02–1, (2002).

Rozwój ubezpieczeń jako czynnik długookresowego wzrostu gospodarczego

Nauki ekonomiczne od lat poszukują czynników długookresowego wzrostu gospodarczego. Jednym z nich jest stopień rozwoju finansowego. Zgodnie z teorią, zarówno rynki finansowe, jak i pośrednicy finansowi są potrzebni w gospodarce, ponieważ pomagają pokonywać problemy niedoskonałości rynku w postaci asymetrii informacyjnej oraz kosztów transakcyjnych. Wpływ pośredników finansowych na wzrost gospodarczy jest realizowany poprzez pełnione funkcje, takie jak: mobilizowanie oszczędności oraz ich transformacja w finansowanie projektów inwestycyjnych, ocena projektów inwestycyjnych oraz monitorowanie menedżerów, zarządzanie ryzykiem i ułatwianie transakcji handlowych. Funkcje te są niezbędne dla powstawania innowacji technologicznych i rozwoju gospodarczego. Ponieważ ubezpieczyciele pełnią większość z tych funkcji, to powinni odgrywać również istotną rolę we wzroście gospodarczym.

W ostatnich dekadach zarówno na świecie, jak i w Polsce obserwuje się relatywnie szybki rozwój ubezpieczeń, natomiast stosunkowo rzadko bada się ich wpływ na wzrost gospodarczy. Opracowanie to dotyczy współzależności zachodzących między rozwojem ubezpieczeń oraz wzrostem gospodarczym (insurance-growth nexus theory). W artykule omówiono kierunki wpływu rozwoju finansowego i rozwoju ubezpieczeń na wzrost gospodarczy, wynikające z teorii pośrednictwa finansowego i teorii endogenicznego wzrostu. Przedstawiono również przegląd badań empirycznych dotyczących tych relacji. W opracowaniu pozytywnie zweryfikowano główną hipotezę badawczą, że rozwój ubezpieczeń, który jest integralną częścią rozwoju finansowego, pozytywnie wpływa na długookresowy wzrost gospodarczy.

Słowa kluczowe: pośrednictwo finansowe; rozwój finansowy; rozwój ubezpieczeń długookresowy wzrost gospodarczy; współzależności między rozwojem finansowym – rozwojem ubezpieczeń – wzrostem gospodarczym.

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GLM and quantile regression models in *a priori* ratemaking¹

Classification a priori ratemaking in non-life insurance applies a different type of multivariate regression models, which is more sensitive to the assumptions that significantly restrict the area of their applications. When an error term is non-Gaussian, asymmetric, fat-tailed or in the presence of outliers, it may have serious consequences for the correct inference of the factor's impact on an endogenous variable. In this paper we analyze two types of regression, which take into account the mentioned problems. The first regression is based on the GLM technique while the second used the modified quantile regression technique. Since the quantile regression is a non-parametric method, there is no measure of the relative quality of the model. For this reason, we propose the cross-validation procedure to compare two models and choose the optimal in terms of minimum cross-validation error.

Key words: Casualty/Property insurance, *a priori* ratemaking, GLMs, quantile regression, cross-validation.

Introduction

The ratemaking process is one of the most important factors in issues regarding insurance portfolios. The techniques of ratemaking are actually based on loss distribution or their moments, which are estimated using historical data. The key challenge is to choose the correct model for the estimation of loss value. Ratemaking of insurance portfolios is frequently based on different multivariate regression models which allow the investigation of rating factors². Nevertheless, the ordinary multivariate regression model has some crucial disadvantages – it is sensitive to assumptions that significantly restrict the area of their applications. In an insurance data case, when an error

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1. This research is supported by a grant from the Polish Ministry of Science and Higher Education (no. NN 111461540).
 2. K. Antonio, and E. Valdez, "Statistical concepts of *a priori* and a posteriori risk classification in insurance," Volume 96 of *ASTA Advances in Statistical Analysis* 2 (2012).

term is non-normal, asymmetric, fat-tailed or in the presence of outliers, it may have serious consequences for the correct inference of the factor's impact on an endogenous variable. Moreover, the ordinary multivariate regression model often ignores a specific feature of the insurance data such as: the possibility of catastrophic losses, the dependence of insured objects on each other (i.e., cumulative risk) or information shortfall to verify the statistical significance of the model chosen³. Therefore, it is important to use models and estimators that are more robust to restrictive classical regression assumptions for modeling insurance data. GLM is a good example of such a model and is therefore used by actuaries⁴. However, there are some problems connected with GLM. The main problem lies in choosing the predictors' distribution in GLM. This can be solved with the simulation procedure based on the Monte Carlo method⁵. The other approach proposed for modeling insured portfolios of policies is the quantile regression approach⁶. This is consistent with the idea of using the distribution quantile for ratemaking. The additional advantage of this method is the fact that it allows the estimation of the net premium rates including safety loadings and it may be estimated as a quantile of loss distribution.

In this paper we present two regression models in *a priori* ratemaking: model GLM and model EQRM. As there is no proper measure to compare GLM and EQRM models, we propose the cross-validation procedure based on RMSE error. In the case study we analyze an example of motor insurance portfolio taken from literature⁷. All computations are performed with the statistical software R.

1. Classical *a priori* ratemaking – model GLM

Nowadays, classical statistical techniques used in *a priori* ratemaking are GLM models. Let $Y_{1,E}, Y_n$ be independent random variables with $y_{1,E}, y_n$ realizations, where Y indicates the claim severity of i -th policy in an insurance portfolio. Further let us denote k risk factors as X_1, \dots, X_k and assume that Y follows three-parameter Tweedie distribution $Y \sim T(\mu, \varphi, p)$ ⁸. The first parameter φ is the dispersion parameter and the second parameter p is the power in the variance of Y_i :

$$\text{Var}(Y_i) = \varphi \mu_i^p, i = 1, \dots, n \quad (1)$$

3. R. Koenker, and K. F. Hallock, "Quantile regression," *Journal of Economic Perspectives* 15(4) (2001).
4. P. McCullagh, and J. A. Nelder, *Generalized Linear Models*, New York: Chapman & Hall/CRC, 1999. Ohlsson, E., and B. Johansson, "Non-Life Insurance Pricing with Generalized Linear Models," Berlin: Springer-Verlag, 2010. De Jong P., and G. Z. Heller. "Generalized Linear Models for Insurance Data," Cambridge: Cambridge University Press, 2008.
5. A. Wolny-Dominiak, and M. Trzysiak, "Monte Carlo Simulation Applied To A Priori Ratemaking," In *Proceedings of 26th International Conference on Mathematical Methods in Economics*, Liberec, 2008.
6. R. Koenker, and B. Basset, "Regression Quantiles," *Econometrica* 46 (1978). Koenker, R. *Quantile regression*. Cambridge: Cambridge University Press, 2005. R. Koenker, and K. F. Hallock, "Quantile regression," *Journal of Economic Perspectives* 15(4) (2001).
7. E. Ohlsson, and B. Johansson, "Non-Life Insurance Pricing with Generalized Linear Models," Berlin: Springer-Verlag, 2010.
8. B. Jørgensen, and M. De Souza, "Fitting Tweedie's compound Poisson model to insurance claims data," *Scandinavian Actuarial Journal* 1 (1994).

The proper GLM model for *a priori* ratemaking has the following components:

$$\begin{cases} Y_i \sim T(\mu_i, \varphi, p) \\ \eta_i = \mathbf{x}_i^T \boldsymbol{\beta} \\ \mu_i = \exp(\eta_i) \end{cases} \quad (2)$$

where \mathbf{x}_i denotes the i -th row of the model matrix X for the i -th policyholder and $\boldsymbol{\beta} = [\beta_0, \beta_1, \dots, \beta_k]^T$ denotes the vector for fixed effects estimated directly from the data. The link function is taken as $\log(\cdot)$ since the multiplicative model is usually applied.

In order to estimate the model (2), we propose a two-step procedure. In the first step, the parameters φ and p are estimated using maximum likelihood estimation and Fourier inversion⁹. In the second step, classical IWSL algorithm to estimate the vector $\boldsymbol{\beta}$ is used with $\hat{\varphi}$ and \hat{p} plug-ins.

Based on the results of *a priori* ratemaking, the base premium for the whole portfolio and the tariff rate for i -th policyholder can be calculated:

$$\begin{cases} B = \exp(\hat{\beta}_0) \\ t_i = \exp(\mathbf{x}_i^T \hat{\boldsymbol{\beta}}) \end{cases} \quad (3)$$

The indicator t_i shows the increase or decrease of the base premium B for i -th policyholder.

2. Alternative *a priori* ratemaking – model EQRM

The alternative approach for *a priori* ratemaking is the distribution-free quantile regression model¹⁰. Similarly as in the GLM model, the goal of the quantile regression model is to estimate vector $\boldsymbol{\beta}$ for a sample of realizations $y_1 \dots y_n$ of a sequence of independent random variables $Y_{1,E}, Y_n$. The basic assumption is that random variables $Y_{1,E}, Y_n$ are taken with distribution $P(Y_i < y) = \mathfrak{I}(y - \mathbf{x}_i^T \boldsymbol{\beta})$ and the distribution \mathfrak{I} is unknown. The linear quantile regression model of order τ , $0 < \tau < 1$ is given by the formula:

$$Q_\tau(Y_i | \mathbf{x}_i) = \mathbf{x}_i^T \boldsymbol{\beta} \quad (4)$$

where $Q_\tau(Y_i | \mathbf{x}_i)$ indicates the conditional quantile of random variable Y_i for probability τ ¹¹.

To apply the linear model (4) in *a priori* ratemaking and take into account the multiplicative model, some modification is necessary. Assuming logarithmic transformation of the conditional quantile $Q_\tau(Y_i | \mathbf{x}_i)$, we receive the exponential quantile regression model (EQRM) of order τ^* of the form:

$$Q_{\tau^*}(Y_i | \mathbf{x}_i) = \exp(\mathbf{x}_i^T \boldsymbol{\beta}^{(\tau^*)}) \quad (5)$$

where $Q_{\tau^*}(Y_i | \mathbf{x}_i)$ indicates the conditional quantile of random variable Y_i for probability τ^* , $0 < \tau^* < 1$, and $\boldsymbol{\beta}^{(\tau^*)} = [\beta_0^{(\tau^*)}, \beta_1^{(\tau^*)}, \beta_2^{(\tau^*)}, \dots, \beta_m^{(\tau^*)}]^T$ is the vector of parameters of order τ^* [see para. 6].

9. P. K. Dunn, and G. K. Smyth, "Evaluation of Tweedie exponential dispersion model densities by Fourier inversion." *Statistics and Computing* 18,1 (2008).

10. A. A. Kudryavtsev, "Using quantile regression for ratemaking," *Insurance: Mathematics and Economics* 45 (2009).

11. R. Koenker, and B. Bassett, "Regression Quantiles," *Econometrica* 46 (1978).

According to para. 8, we define the τ^* -th quantile regression estimator of $\beta^{(\tau^*)}$ as the vector \mathbf{b} being the solution of the minimization problem:

$$\min_{\mathbf{b} \in \mathbb{R}^{m+1}} \left[\sum_{i \in \{i: y_i \geq \mathbf{x}_i^T \mathbf{b}\}} \tau^* |y_i - \exp(\mathbf{x}_i^T \mathbf{b})| + \sum_{i \in \{i: y_i < \mathbf{x}_i^T \mathbf{b}\}} (1 - \tau^*) |y_i - \exp(\mathbf{x}_i^T \mathbf{b})| \right] \quad (6)$$

Because the error distribution term is unspecified, statistical inference is based on nonparametric approach – the bootstrap or Monte Carlo method.

The results of *a priori* ratemaking are as with a classical approach: the base premium for the whole portfolio and the tariff rate for i -th policyholder:

$$\begin{cases} B^* = \exp(\hat{\beta}_0^{(\tau^*)}) \\ t_i^* = \exp(\mathbf{x}_i^T \hat{\beta}^{(\tau^*)}) \end{cases} \quad (7)$$

3. Cross-validation procedure

In order to unify the process of comparing the classical and alternative approach in *a priori* ratemaking, we propose applying the cross-validation procedure based on RMSE error¹². In our case study we use a 5-fold cross-validation algorithm for models (2) and (5). The procedure is as follows:

- (s1) randomly divide the training set into $k = 5$ approximately equally sized parts, (n – the training set size, m – the size of the l -th subset, $l = 1, \dots, 5$)
- (s2) build every model 5 times using 4 of 5 parts ($n - m_l$ observations), treating excluded observations as the validation set,

- (s3) calculate 5 times the value of the mean squared error $RMSE_l = \sqrt{\frac{\sum (y - \hat{\mu}_l)^2}{m_l}}$ using the validation set,

- (s4) estimate the cross-validation error: $cv = \sum_{i=1}^5 \frac{m_l}{n} RMSE_l$

The model with the smallest cv value is taken as a better estimation of the base premium in the portfolio and tariff rates.

4. Case study – automobile insurance portfolio

In order to illustrate the process of *a priori* ratemaking with GLM and EQRM models, we considered a motor insurance portfolio from the former Swedish insurance company Wasa, which concerns partial motor hull insurance, for motorcycles¹³. In the model we complied the following rating variables:

12. S. Portnoy, and R. Koenker, "The Gaussian Hare and the Laplacian Tortoise: Computability of Squared– Error Versus Absolute-Error Estimators, with Discussion," Statistical Science 12 [1997].

13. E. Ohlsson, and B. Johansson, "Non-Life Insurance Pricing with Generalized Linear Models," Berlin: Springer–Verlag, 2010.

Rating variable	Rating variable [origin name]	Rating variable [description]
X_1	Agarald	owner's age
X_2	Kon	gender
X_3	Mcklass	MC class, a classification by the so called EV ratio, defined as $\{\text{Engine power in kW} \times 100\} / \{\text{Vehicle weight in kg} + 75\}$, rounded to the nearest lower integer. The 75 kg represents the average driver's weight.
X_4	Fordald	vehicle age
E	Duration	number of policy years (exposure)
Ω	Antskad	number of claims
Y	Skadkost	claim cost

Source: the author's own research.

Firstly, we considered the GLM model [2], and the parameters p and ϕ were estimated with R package {tweedie}. Following that, the GLM model was constructed with the following components:

$$\begin{cases} Y_i \sim T(\mu_i, \hat{\phi} = 0.008, \hat{p} = 1.63) \\ \eta_i = \mathbf{x}_i^T \boldsymbol{\beta} \\ \mu_i = \exp(\eta_i) \end{cases} \quad (8)$$

Finally, we estimated the model (8) using an IWSL algorithm as well as the model (5) by minimization of the problem (6). The computations were performed with two R Packages: {stats} for GLM and {quantreg} for EQRM models.

At the initial stage of the estimation of all rating variables X_1, \dots, X_4 were included in the model, but only the "owner's age" proved to be statistically significant. Ultimately, in GLM and EQRM models only one rating variable was introduced. The results of the estimation are shown in Tab. 1 and Tab 2.

Table 1. Model parameters for GLM and EQRM models

	Estimate	s.e.	p-value	Estimate	s.e.	p-value
Intercept	9,44	0,28	0,00	10,47	0,45	0,00
The owner's age B	0,67	0,31	0,03	0,88	0,46	0,06
The owner's age C	1,10	0,31	0,00	1,26	0,51	0,01
The owner's age D	0,95	0,33	0,00	1,51	0,51	0,00
The owner's age E	0,66	0,31	0,03	1,29	0,53	0,02
The owner's age F	0,78	0,33	0,02	1,38	0,64	0,03
The owner's age G	-0,12	0,53	0,82	0,37	0,58	0,53

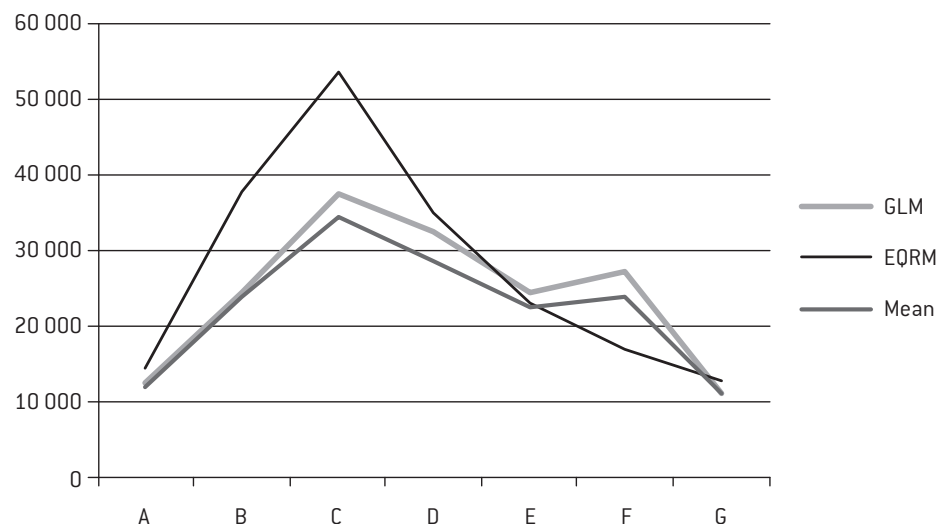
Source: the author's own research.

Table 2. The summary of the estimation of claim costs for the owner's age

The owner's age	The numbers of policies in the portfolio	Classes of the owner's age	GLM	EQRM	Mean Claim cost
17–20	1658 [2.66%]	<i>Base claim cost</i> A	12 536	14 472	11 956
21–25	5831 [9.36%]	B	24 408	37 798	23 874
26–30	7311 [11.73%]	C	37 578	53 637	34 421
31–40	9997 [16.04%]	D	32 500	34 892	28 681
41–50	19258 [30.9%]	E	24 292	23 156	22 516
51–50	13521 [21.7%]	F	27 221	16 815	23 827
61–	4746 [7.62%]	G	11 077	12 708	11 077

Source: the author's own research.

Figure 1. Estimated claim costs for the owner's age – the comparison



Source: the author's own research.

Since only one rating variable is statistically significant, we compare the estimated claim cost in the portfolio with the mean value in groups. In both analyzed models, the base claim cost is relatively higher than the mean claim cost. The similar situation is in the case of the fitted claim costs obtained in the GLM model. We also observe a large discrepancy in the results obtained in EQRM model when compared to the mean. In the preliminary comparison, both GLM and EQRM models (Fig. 1) clearly show that claim costs estimated by the GLM model are closer to mean costs than in the EQRM. In order to compare models by means of a unified measure, the 5-fold cross-validation procedure was applied. RMSE error in each validation set and Cross-validation RMSE {cv} are as follows:

Table 3. RMSE for GLM and EQRM models

<i>Validation set</i>	RMSE GLM	RMSE EQRM
ValidPart1	44 242,10	46 440,60
ValidPart2	34 029,20	35 833,40
ValidPart3	34 799,30	42 178,10
ValidPart4	44 823,10	41 178,40
ValidPart5	48 603,80	45 142,90

Source: the author's own research.

Table 4 Cross-validation GLM and EQRM model

<i>Model</i>	<i>Cross-validation RMS...</i>
GLM	41 299,5
EQRM	42 154,7

Source: the author's own research.

For the analyzed portfolio, the lowest cv error was obtained for the GLM model. Therefore, in this case, for further calculations of tariff rates and net premiums for the i -th policy, the GLM model should be used. Using the cross-validation procedure gives fairly demonstrative results that may be a prelude to further analysis and verification of the models. The problem lies in the selection of unified tests that would allow the final choice of the method for *a priori* ratemaking.

5. Conclusions

Nowadays, GLMs are standard industry practice for *a priori* ratemaking. These models extend the ordinary linear models to the class of the exponential dispersion family of distributions. However, problems with wrong-fitted distribution can still occur. That is why we tested the capabilities of the quantile regression in ratemaking. Firstly, the distribution of error terms is left unspecified – this is the main virtue of the method as far as robustness to outliers is concerned. Secondly, quantile estimates detect the influence of co-variables on alternate parts of the conditional distribution, which we can choose arbitrarily (by using various orders of quantile). Thus, quantile regression can be recommended in cases of non-normal asymmetric distributions – asymmetric or fat-tailed distributions. Despite these advantages, the GLM model can still be the better solution. A useful technique for a model selection is the cross-validation procedure.

Quantile regression is becoming more and more popular in practice, especially in finance theory. We suspect that it could also be a very useful tool in the insurance business¹⁴. We note that

14. A.A. Kudryavtsev, "Using quantile regression for ratemaking," *Insurance: Mathematics and Economics* 45 [2009].

the distribution-free approach is often used for estimation¹⁵. Applications of quantile regression for the Polish capital market can be found in w papers¹⁶.

References

- Antonio K., and Valdez E., "Statistical concepts of *a priori* and a posteriori risk classification in insurance," Volume 96 of *ASTA Advances in Statistical Analysis* 2 (2012).
- De Jong P., and Heller G. Z., "Generalized Linear Models for Insurance Data," Cambridge: Cambridge University Press, 2008.
- Dunn P., K., and Smyth G. K., "Evaluation of Tweedie exponential dispersion model densities by Fourier inversion," *Statistics and Computing* 18,1 (2008).
- Jørgensen, B., and De Souza M., "Fitting Tweedie's compound Poisson model to insurance claims data," *Scandinavian Actuarial Journal* 1 (1994).
- Koenker, R., and Bassett B., "Regression Quantiles," *Econometrica* 46 (1978).
- Koenker, R., "Quantile regression," Cambridge: Cambridge University Press, 2005.
- Koenker, R., and Hallock K. F., "Quantile regression," *Journal of Economic Perspectives* 15(4) (2001).
- Kudryavtsev, A. A., "Using quantile regression for ratemaking," *Insurance: Mathematics and Economics* 45 (2009).
- McCullagh, P., and Nelder J. A., "Generalized Linear Models," New York: Chapman & Hall/CRC, 1999.
- Ohlsson, E., and Johansson B., "Non-Life Insurance Pricing with Generalized Linear Models", Berlin: Springer-Verlag, 2010.
- Orwat-Acedańska, A., and Trzpiot G., "Quantile Regression in management style analysis of mutual balanced funds," *Financial Investments and Insurance – World Trends and the Polish Market* 183 (2011a).
- Orwat-Acedańska, A., and Trzpiot G., "The classification of Polish mutual balanced funds based on management style – quantile regression approach," *Theory and Applications of Quantitative Methods, Econometrics* 31, 194 (2011b).
- Portnoy, S., and Koenker R., "The Gaussian Hare and the Laplacian Tortoise: Computability of Squared-Error Versus Absolute-Error Estimators, with Discussion," *Statistical Science* 12 (1997).
- Trzpiot, G., "Quantile Regression Model of Return Rate Relation – Volatility for Some Warsaw Stock Exchange Indexes," *Finances, Financial Markets and Insurance. Capital Market* 28 (2010).
- Trzpiot, G., "Bayesian Quantile Regression," *Studia Ekonomiczne, Zeszyty Naukowe* 65 (2011): 33–44.
- Wolny-Dominiak, A., and Trzęsiok M., "Monte Carlo Simulation Applied To *A Priori* Ratemaking," in *Proceedings of 26th International Conference on Mathematical Methods in Economics*, Liberec, 2008.

15. R. Koenker, "Quantile regression," Cambridge: Cambridge University Press, 2005. R. Koenker and K. F. Hallock. "Quantile regression." *Journal of Economic Perspectives* 15(4) (2001).

16. A. Orwat-Acedańska and G. Trzpiot, "The classification of Polish mutual balanced funds based on management style – quantile regression approach," *Theory and Applications of Quantitative Methods, Econometrics* 31, 194 (2011b). G. Trzpiot, "Quantile Regression Model of Return Rate Relation – Volatility for Some Warsaw Stock Exchange Indexes," *Finances, Financial Markets and Insurance. Capital Market* 28 (2010). Trzpiot, G. "Bayesian Quantile Regression," *Studia Ekonomiczne, Zeszyty Naukowe* 65 (2011): 33–44.

Modele GLM i regresji kwantylowej w taryfikacji *a priori*

W procesie taryfikacji a priori w ubezpieczeniach majątkowych wykorzystywane są głównie modele regresyjne klasy GLM, w których przyjmowane jest założenie odnośnie zmiennej objaśnianej umożliwiające przyjęcie w modelu innego rozkładu prawdopodobieństwa niż jedynie rozkład normalny. Zatem rodzi się problem wyboru rozkładu zakładanego w modelu. W niniejszym artykule rozpatrujemy możliwość zastosowania regresji kwantylowej, w której nie zakłada się żadnej postaci rozkładu, co eliminuje wspomniany wyżej problem. Rozważamy zarówno model GLM jak również model zmodyfikowanej regresji kwantylowej dla portfela polis ubezpieczeniowych. Jako że regresja kwantylowa jest modelem nieparametrycznym, nie zdefiniowano miary będącej odpowiednikiem kryterium AIC w modelu GLM. Powoduje to trudności w porównywaniu modeli, a dalej w ostatecznym wyborze modelu do taryfikacji. Dlatego w pracy proponujemy zastosowanie procedury krosvalidacji w celu porównania modeli GLM oraz regresji kwantylowej i dalej wyboru modelu lepszego tzn. takiego, który daje mniejszy błąd cv.

Słowa kluczowe: ubezpieczenia majątkowe, taryfikacja *a priori*, model GLM, regresja kwantylowa, krosvalidacja.

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The comparison of the effect of gender equal treatment on insurance in Poland and other selected European Union countries

Since 21 December 2012 gender-based pricing for insurance products has been banned in Europe. It is expected that this ban will cause negative consequences for both insurance markets and consumers. A number of studies have been conducted to evaluate the potential impact of the changes. The aim of the present study is to examine the differences among European populations connected with unisex premiums and benefits in life and motor insurance. The differences in mortality have been investigated in 22 European countries. The mortality data have been taken from the Human Mortality Database and Polish Central Statistical Office. The risk in motor insurance has been evaluated on the basis of statistical data concerning drivers involved in accidents and driving licences recorded for Poland, Germany and the United Kingdom.

It has been demonstrated that Central-East Europe is characterized by larger malefemale differences in mortality, so as a result, the introduction of the ban to use gender as a risk factor in insurance will cause relatively greater changes of net premiums in these countries.

In the case of motor insurance, it is probable that the average cost of an insurance claim is going to be different across the EU countries. The risk of causing a car accident is much greater for young male drivers than it is for female drivers at the same age, but the figure differs between regions. The unisex pricing of premiums and benefits would cause various levels of changes in the EU countries. The above analysis does not take into account the effects of other possible changes in the underwriting process. The ban on gender-based pricing can cause such changes.

Key words: risk insurance, gender, life insurance, motor insurance.

Introduction

The decision of the European Court of Justice of 1 March 2011 (Test-Achats ruling) banning gender-based pricing for insurance products initiated a discussion about the potential impact of this decision on the insurance market. It is expected that this ban will cause negative consequences for both insurance markets and consumers.

The aim of this paper is to examine the differences among European populations connected with unisex premiums and benefits in life and motor insurance. In empirical study the differences in mortality have been investigated in 22 European countries. The mortality data have been taken from the Human Mortality Database and Polish Central Statistical Office. The risk in motor insurance has been evaluated on the basis of the statistical data concerning drivers involved in accidents and driving licences recorded for Poland, Germany and Great Britain.

1. The genesis of the introduction of gender equality principle in insurance

The principle of gender equality was originally introduced in the Treaty establishing the European Economic Community in 1957. Primarily, it was a negative obligation prohibiting discrimination. Later it developed into a positive principle promoting equality. The Charter of Fundamental Rights of the European Union states that “everyone is equal before the law.” Any forms of discrimination are prohibited. It is also said there explicitly that “equality between men and women must be ensured in all areas.”

To extend the scope of the application of this principle, three generations of Directives have been introduced. The first generation aimed at ensuring gender equality, especially on the labour market. The second generation extended the principle to personal characteristics other than gender, such as race, age and disability. The third generation of Directives consists of two groups of legal regulations. The aim of the first group is to reorganise and make legislation more accessible in this area, the second extends the application of the principle to different areas beyond the labour market. These directives introduced the concepts of direct and indirect discrimination. Direct discrimination refers to treating one person less favourably than another on certain specified grounds, whereas indirect discrimination occurs where the effect of certain requirements, conditions or practices has an adverse disproportionate impact on a specific group. The European Union considers gender equality a concept related to individuals. Individuals have the right to be treated equally regardless of the group (e.g., gender group) to which they belong.¹

One of the third generation directives is Directive 2004/113 (Council Directive 2004/113/EC of 13 December 2004) which took effect in December 2007. In general, this directive prohibits “the use of sex as a factor in the calculation of premiums and benefits for the purposes of insurance and related financial services” “in all new contracts concluded after 21 December 2007.” The directive gave the Member States the option to permit proportionate differences in individu-

1. E. Torella, “On lies and statistics: the relationship between gender equality and insurance,” *ERA Forum* 12 (2011): 60 and Thierry Y. and Schoubroeck Van C., “Fairness and Equality in Insurance Classification,” *The Geneva Papers* 31 (2006).

als' premiums and benefits when gender is considered a determining factor in assessing risks, the use of which would be justified by actuarial data and statistics that the public authorities consider sufficiently relevant and accurate. A number of countries have applied this option.² Over the years, the insurance sector has used gender as an underwriting factor in life insurance and some classes of non-life insurance, particularly motor insurance. On 1 March 2011, the Court of Justice of the European Union decided, in the Test-Achats ruling, that as from 21 December 2012 the use of gender as a risk factor by insurers should not lead to individual differences in the premiums and benefits for men and women. It was argued that the use of gender as a rating factor was contrary to the objective of equal treatment of men and women.³ The decision was taken despite the explicit recognition of the fact that men and women "do not face the same risks" and their profile is thus different. The Commission based its reasoning upon two main elements. Firstly, there is a wide range of factors besides gender which can be more accurate to calculate individual premiums.⁴ This includes lifestyle factors, such as eating habits, marital status or smoking and level of income, which frequently have a stronger impact on health and life expectancy. Secondly, it was argued that the examples of the countries using unisex rules in calculating premiums proved that gender as a risk factor was not irreplaceable.

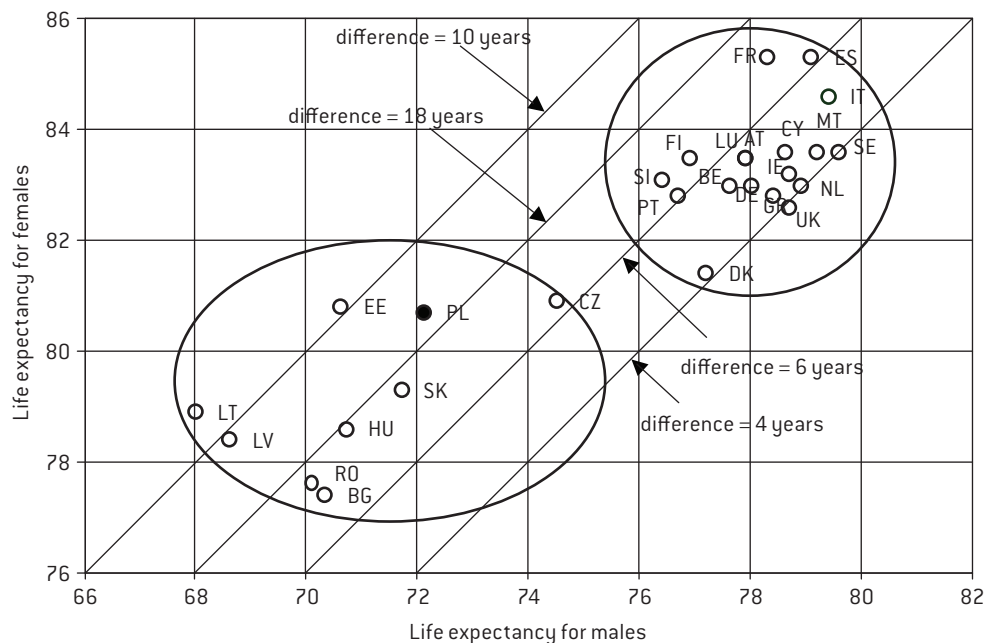
On the other hand, a number of research conducted in the 20th century proved the importance of gender and age as significant risk factors.⁵ On the basis of research and practice of insurance companies, gender is considered as a long-term and stable indicator of risk.⁶ Excluding important risk factors from risk models can result in adverse selection and more heterogeneous insurance portfolios. In the future differences in the results of the ban will be seen in particular countries due to the differences in demographic structures.

2. Excess male mortality in Poland and selected European Union countries

The difference in the mortality of males and females is a biological regularity.⁷ Moreover, the differences in mortality are observed among regions. An essential parameter of the distribution of lifespan is life expectancy. This parameter is shown for the 27 EU countries in Figure 1. The vertical axis is life expectancy for females and the horizontal axis is life expectancy for males, both in the year 2010. The EU countries are divided into two groups according to the life expectancy

2. V. Petkantchin, "EU anti-discrimination policy's impact on insurance risk management: A parallel with the US sub-prime crisis," *Pensions* 15, 3 (2010): 156.
3. "Gender-neutral insurance," Ernst & Young, accessed March 2012, www.ey.com; B. Jackowska and E. Wysocka, "Znaczenie wyroku Trybunału Sprawiedliwości Unii Europejskiej z dnia 1 marca 2011 r. w wybranych ubezpieczeniach życiowych i majątkowych," *Wiadomości Ubezpieczeniowe* 3 (2012): 5-15.
4. Torella, "On lies," 64.
5. Cf. H. L. Doeringhaus, J. T. Schmit and J. Yeh, "Age and Gender on Auto Liability Insurance Payouts," *The Journal of Risk and Insurance* 75, 3 (2008): 527-550; H. S. Lonczak, C. Neighbors and D. M. Donovan, "Predicting risky and angry driving as a function of gender," *Accident Analysis and Prevention*, 39 (2007): 536-545 and many other authors.
6. "The impact of a ban on the use of gender in insurance," European study conducted by Oxera, December 2011, i.
7. D. A. Gleit and S. Hourich, "The narrowing sex differential in life expectancy in high-income populations: ...effects of differences in the age pattern of mortality," *Population Studies* 61, 2 (2007).

Figure 1. Life expectancy at birth for males and females in the countries of the European Union in 2010



AT	Austria	FI	Finland	LV	Latvia	SK	Slovakia
BE	Belgium	FR	France	MT	Malta	SI	Slovenia
BG	Bulgaria	GR	Greece	NL	Netherlands	SE	Sweden
CY	Cyprus	ES	Spain	DE	Germany	HU	Hungary
CZ	Czech Republic	IE	Ireland	PL	Poland	UK	United Kingdom
DK	Denmark	LT	Lithuania	PT	Portugal	IT	Italy
EE	Estonia	LU	Luxemburg	RO	Romania		

Source: GUS, *Trwanie życia w 2011 r.*, (Warszawa: GUS, 2012).

of males and females. The first group includes the countries of Central and Eastern Europe (except Slovenia), that is Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Poland, Romania and Slovakia. The second group consists of Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, Spain, Sweden, and the United Kingdom.

The first group is characterized by shorter life expectancy for both males and females, and in most cases, the larger difference in life expectancy between males and females as compared to the other group. In the first group, male life expectancy was in the range from 68.0 years (Lithuania) to 74.5 years (the Czech Republic), and female life expectancy from 77.4 years (Bulgaria) to 80.9 years (the Czech Republic). In this group, the smallest difference in average life expectancy between males and females was 6.4 years (the Czech Republic), and the highest was 10.9 years (Lithuania). In the second group, life expectancy for males varied from 76.4 years (Slovenia) to 79.6 years (Sweden), and for females from 81.4 years (Denmark) to 85.3 years (Spain). In this group, the difference between life expectancy for males and females was in the range of 3.9 years (the United Kingdom) to 7.0 years (France). Due to the fact that in the EU countries the phe-

nomenon of excess male mortality occurs with varying intensity, the adoption of unisex life tables affects the actuarial calculation results in different degrees in particular countries.

In the further analysis, we have employed five-year-age death rates as well as complete life tables for males and females separately and complete unisex tables⁸ derived from the Human Mortality Database [HMD]⁹. The HMD has no data concerning the following EU countries: Croatia, Cyprus, Greece, Malta and Romania. In order to maintain a uniform methodology for determining mortality rates and probabilities of death, these data have been used as the only source of data, so the above-mentioned countries have been excluded from the further analysis. Additionally, Luxemburg has been excluded from the analysis due to its insurance indicators being incomparable to those of other countries.¹⁰ Finally, the comparison took account of 22 EU countries with the 2009 data. These are the latest available data for all the selected countries. For countries where there are fewer than four million inhabitants (Estonia, Latvia, Lithuania and Slovenia) five-year data (2005–2009) have been used in order to exclude random effects in mortality pattern.

The force of mortality is strongly differentiated by age and gender. In the analysed countries death rates for males in almost all five-year age intervals exceeded the corresponding rates for females (Table 1). The degree of male-female differences in mortality depends on the age and the country.¹¹ In the majority of the countries, the largest excess mortality occurred in the interval 20–24 years. In the age intervals with the highest excess mortality, the death rate for males was several times higher than the death rate for females:

- more than 5-times in Estonia;
- more than 4 times in Latvia, Lithuania, Slovakia, Slovenia and Poland;
- more than 3 times in Bulgaria, the Czech Republic, Finland, France, Hungary, Ireland and Sweden;
- more than twice in the remaining analysed countries.

The ratios of male to female death rates achieve low values for infants and children and increase for older age groups. The maximum is observed most frequently at the age interval of 20–24 years or at next intervals. In the following intervals the values of the ratios decrease with the local minimum for most of the countries at the interval 40–44 years or 45–49 years and then increase (except for Estonia, Latvia, Lithuania, Poland and Slovenia). The second local maximum is between the ages of 55 and 70. However, this maximum is lower than the first one (except for Spain). To illustrate these characteristics the specific shape of the ratio curve for three EU countries with the highest gross written premiums (France, Germany and the United Kingdom) and for three countries from Central and Eastern Europe with the highest gross written premiums (Czech Republic, Hungary and Poland) is presented in Figure 2.

8. R.L. Brown, "Introduction to the Mathematics of Demography" (Winsted, Connecticut: AXTEX Publications, 1993).

9. The Human Mortality Database [HMD] is a project of the University of California at Berkeley (United States) and the Max Planck Institute for Demographic Research (Rostock, Germany) [www.mortality.org].

10. Luxembourg, due to its tax system and administrative procedures, is very often chosen for headquarters by the insurance companies who operate in other European countries.

11. Besides genetic reasons, cultural and social conditions are causes of excess male mortality.

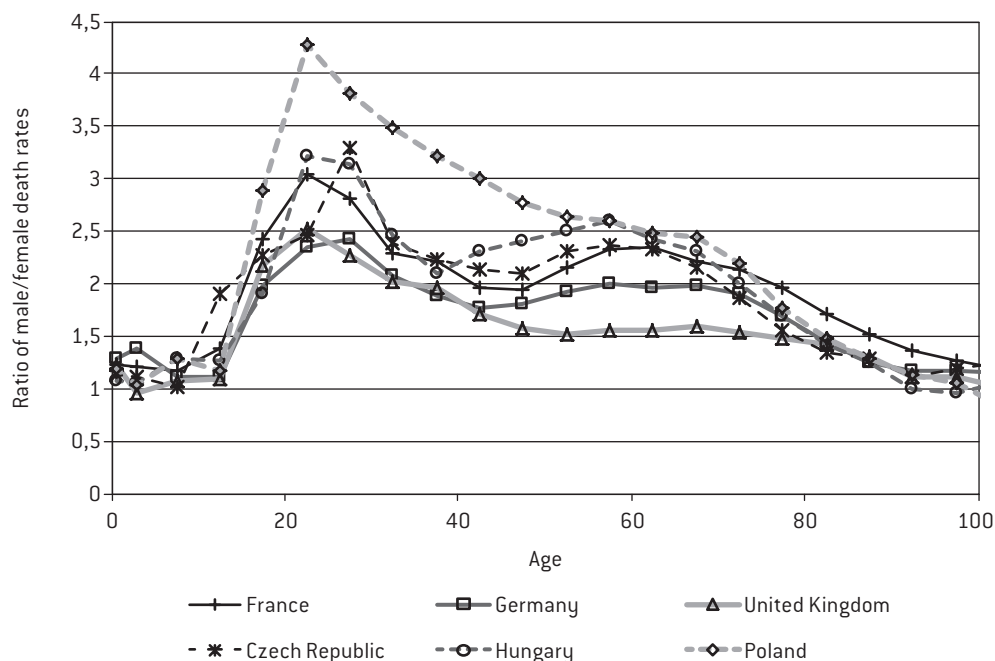
Table 1. The ratio of male/female death rates in the selected European Union countries in 2009* (the highest value for each country is in bold)

Country	Age																				
	0	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99
Austria	1.141	0.900	1.221	1.265	2.828	2.980	2.603	2.240	1.994	1.965	1.993	1.878	2.229	2.111	2.001	1.892	1.720	1.452	1.310	1.164	1.098
Belgium	1.235	1.394	0.640	1.495	1.737	2.831	2.367	1.991	2.020	1.607	1.600	1.744	1.810	1.889	1.832	1.851	1.773	1.530	1.399	1.261	1.222
Bulgaria	1.309	0.846	2.108	1.794	2.122	3.044	2.217	2.091	2.165	2.356	2.296	2.582	2.647	2.577	2.191	1.743	1.442	1.259	1.099	1.064	1.056
Czech Republic	1.134	1.109	1.019	1.896	2.276	2.464	3.285	2.384	2.222	2.132	2.094	2.299	2.365	2.326	2.159	1.870	1.560	1.350	1.284	1.116	1.192
Denmark	1.080	0.543	0.678	1.338	1.900	2.630	2.255	2.057	2.030	1.774	1.479	1.629	1.618	1.616	1.476	1.506	1.429	1.455	1.372	1.347	1.067
Estonia*	1.300	1.131	1.273	1.503	2.799	3.517	5.135	4.014	3.405	3.412	3.228	3.168	3.105	3.065	2.948	2.478	1.959	1.491	1.311	1.187	1.035
Finland	0.936	0.964	1.439	0.908	2.553	2.896	2.828	3.109	2.716	2.139	2.300	2.241	2.121	2.265	2.308	2.117	1.909	1.584	1.393	1.212	1.237
France	1.233	1.211	1.169	1.382	2.421	3.036	2.814	2.279	2.216	1.966	1.946	2.152	2.335	2.350	2.210	2.126	1.965	1.711	1.512	1.355	1.261
Germany	1.279	1.379	1.110	1.115	1.979	2.341	2.422	2.076	1.874	1.771	1.798	1.913	1.991	1.952	1.972	1.901	1.681	1.435	1.255	1.171	1.162
Hungary	1.077	1.048	1.279	1.264	1.898	3.220	3.147	2.465	2.095	2.302	2.398	2.493	2.595	2.433	2.313	1.995	1.696	1.418	1.239	1.003	0.955
Ireland	1.328	1.214	0.959	1.293	2.839	3.411	2.773	2.582	2.188	1.855	1.365	1.632	1.523	1.674	1.916	1.615	1.570	1.546	1.376	1.175	1.196
Italy	1.175	1.250	1.036	1.838	2.645	2.653	2.807	2.321	1.960	1.794	1.605	1.666	1.847	1.964	1.985	1.894	1.794	1.617	1.402	1.243	1.200
Latvia*	1.104	1.591	1.891	1.708	2.469	4.149	4.226	3.903	3.121	3.144	2.972	2.916	2.911	2.934	2.655	2.199	1.802	1.429	1.254	1.177	1.104
Lithuania*	1.184	1.423	2.028	1.565	3.030	4.850	4.636	4.136	3.657	3.386	3.259	3.178	3.009	3.043	2.813	2.257	1.791	1.481	1.221	1.073	0.973
Netherlands	1.182	1.212	1.212	1.259	1.629	2.351	1.844	1.628	1.366	1.262	1.210	1.223	1.440	1.555	1.700	1.807	1.747	1.570	1.389	1.267	1.164
Poland	1.193	1.033	1.288	1.174	2.880	4.277	3.808	3.477	3.221	3.012	2.764	2.640	2.593	2.490	2.451	2.184	1.767	1.469	1.276	1.128	1.054
Portugal	1.307	1.270	1.198	1.318	2.250	2.505	2.782	2.336	2.088	2.294	2.368	2.358	2.475	2.284	2.146	1.968	1.754	1.499	1.265	1.170	1.155
Slovakia	1.446	1.073	1.627	1.124	2.027	4.619	3.094	2.686	2.696	2.589	2.535	2.638	2.603	2.598	2.432	1.956	1.645	1.390	1.174	1.064	1.005
Slovenia*	1.029	1.487	0.559	1.327	2.530	3.929	4.141	2.988	2.528	2.699	2.465	2.239	2.419	2.449	2.354	2.096	1.826	1.498	1.303	1.239	1.137
Spain	1.183	1.216	1.114	1.654	2.119	2.167	2.424	2.304	2.022	1.976	2.051	2.214	2.559	2.651	2.586	2.230	1.967	1.606	1.337	1.152	1.091
Sweden	1.072	1.599	1.392	1.753	1.607	3.045	2.928	2.289	1.727	1.523	1.446	1.473	1.551	1.498	1.558	1.535	1.616	1.514	1.375	1.296	1.241
United Kingdom	1.222	0.963	1.078	1.093	2.176	2.514	2.275	2.025	1.951	1.712	1.569	1.508	1.564	1.552	1.600	1.539	1.481	1.410	1.307	1.119	1.108

Five-year data (2005–2009) for countries where there are fewer than 4 million inhabitants.

Source: own elaboration on the basis of the HMD data.

Figure 2. The ratio of male/female death rates in five-year age groups* in the selected countries of the EU in 2009



* Age intervals 0, 1–4, 5–9, 10–14, ..., 95–99.

Source: own elaboration on the basis of the HMD data.

3. The importance of using unisex tables for life-insurance purposes

Excess male mortality has different values in different countries (compare Figure 1 and Table 1). The introduction of the ban on the use of gender as a factor in calculations of premiums and benefits will cause a different range of changes in life-insurance in these countries. To evaluate the range of changes, for the 22 selected EU countries, net monthly premiums for whole life insurance have been calculated.¹² The assumptions for the calculations are as follows: whole life insurance, entry age of 20–60 years, a fixed sum insured, the technical insurance rate 3 per cent. The second evaluation is for the amount of monthly payments from a whole life annuity¹³ purchased at the age of 60–80, a fixed value of a net single premium, the technical insurance rate 3 per cent. If demographic

12. Calculations according to actuarial principles. Formula for the net premiums payable m -times a year. E.g., N.L. Bowers, H.U. Gerber, J. Hickman, D. Jones and C.J. Nesbitt, "Actuarial mathematics," in *The Society of Actuaries* (Schaumburg, Illinois, 1997), 189; H.U. Gerber, "Life Insurance Mathematics," (Zurich: Springer, 1990), 52–55.

13. Calculations according to actuarial principles. Formula for the actuarial present value of a whole life annuity with m -times a year payments. E.g., N.L. Bowers, H.U. Gerber, J. Hickman, D. Jones and C.J. Nesbitt, "Actuarial mathematics," in *The Society of Actuaries* (Schaumburg, Illinois, 1997), 149–152; H.U. Gerber, "Life Insurance Mathematics," (Zurich: Springer, 1990), 37–38.

Table 2. Percentage changes caused by the ban on differentiating premiums and benefits based on gender for whole life insurance and whole life annuity in the selected EU countries – calculations on the basis of 3 per cent interest rate and life tables for 2009*

No.	Country	Interval of changes of net monthly premiums for whole life insurance** entry age x = 20, 21, ..., 60		Interval of changes of monthly values of payments from whole life annuity*** purchased at age x = 60, 61, ..., 80	
		Males Decrease in %	Females Increase in %	Males Decrease in %	Females Increase in %
1	Austria	10.3–13.3	10.8–11.6	7.4–10.4	4.7–5.6
2	Belgium	9.7–13.2	10.2–11.0	7.3–12.1	5.3–6.2
3	Bulgaria	12.6–15.5	15.3–17.7	6.2–9.5	4.2–8.5
4	Czech Republic	11.3–14.8	13.2–14.4	8.9–9.9	4.7–7.0
5	Denmark	7.9–10.2	8.3–8.8	5.8–11.5	4.4–6.2
6	Estonia*	19.3–23.2	20.8–26.2	13.1–16.1	4.7–11.1
7	Finland	12.4–15.2	13.3–14.8	8.5–11.9	6.1–7.0
8	France	12.2–15.4	12.8–14.2	8.3–13.5	6.0–6.6
9	Germany	9.6–12.8	10.3–11.1	7.1–10.2	4.4–5.5
10	Hungary	14.1–18.9	16.9–20.5	10.3–12.5	4.8–9.2
11	Ireland	8.8–11.6	8.8–10.6	6.4–12.0	5.0–6.7
12	Italy	9.4–12.9	9.4–10.5	6.9–12.1	5.0–6.2
13	Latvia*	19.1–23.0	20.1–26.3	12.8–15.7	4.1–11.1
14	Lithuania*	20.6–23.0	21.1–30.4	11.6–14.9	4.6–11.4
15	Netherlands	7.5–12.0	6.9–9.6	6.6–12.3	4.7–6.5
16	Poland	15.4–18.2	17.0–19.1	10.3–12.0	6.2–9.0
17	Portugal	11.4–13.2	11.7–13.4	7.4–10.2	5.8–6.5
18	Slovakia	13.6–17.4	16.0–18.2	9.5–11.7	4.7–8.7
19	Slovenia*	12.7–15.6	15.0–16.0	9.1–12.2	5.1–7.8
20	Spain	11.1–14.5	12.9–14.2	7.8–10.6	5.9–7.0
21	Sweden	7.3–9.8	7.1–8.2	5.2–10.7	4.0–6.3
22	United Kingdom	7.9–9.9	7.8–8.5	5.4–9.2	4.0–4.9

* Five-year data (2005–2009) for countries where there are fewer than 4 million inhabitants.

** With a fixed sum insured (on a particular assumed value).

*** For equal value of a single net premium (on a particular assumed value).

Source: own elaboration on the basis of life tables from the HMD.

life tables concerning particular countries¹⁴ are taken for actuarial calculations, the replacement of separate life tables for males and females by unisex tables causes the decrease in net premiums in life insurance for males and their increase for females.

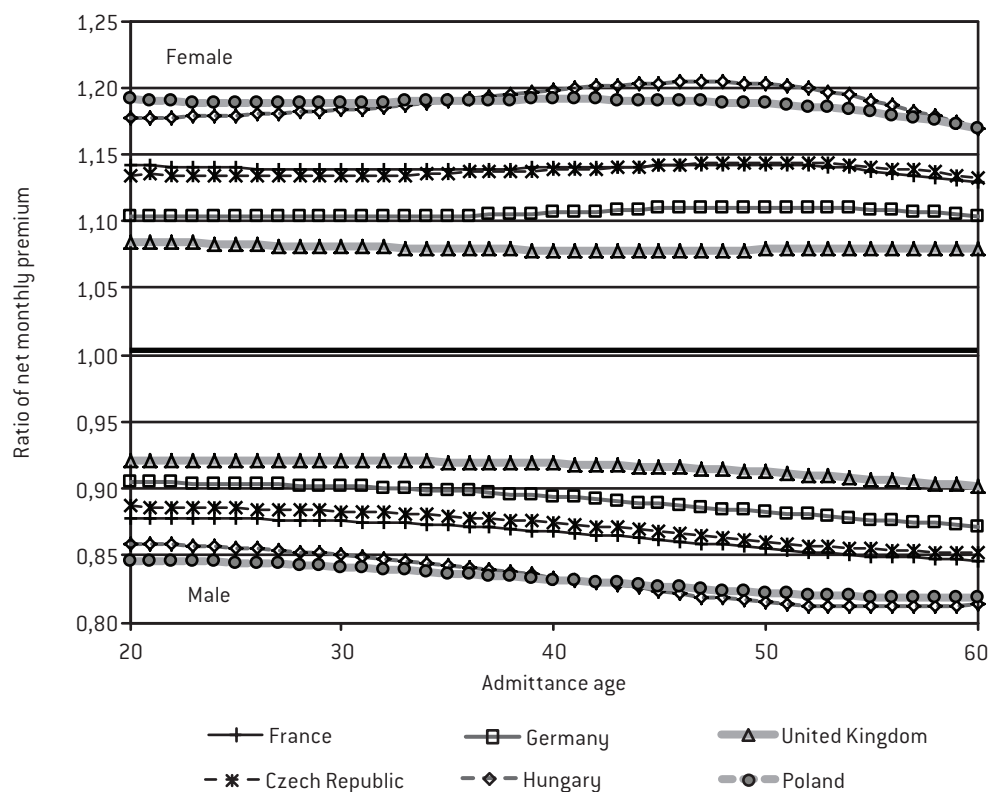
14. In practice, a population of the insured can be different from a country population. Insurance companies create actuarial life tables based on their own data and use demographic life tables only incidentally. A. Finkelstein, J. Poterba, "Adverse Selection in Insurance Markets: Policyholder evidence from the U.K. Annuity Market," *NBER Working Paper* 8045 (2000).

The opposite situation will be observed in life annuities: the decrease in the amount of payments for males and its increase for females (Table 2). The higher relative changes are, the bigger excess male mortality is. The percentage change of the net monthly premium for a whole life cover with entry age of 20–60 and with a fixed sum insured as well as the percentage change of monthly payments for life annuity made at the age of 60–80 for a fixed net single premium (Table 2):

- was the biggest in Estonia, Latvia and Lithuania,
- was the smallest in the UK, Sweden and Denmark.

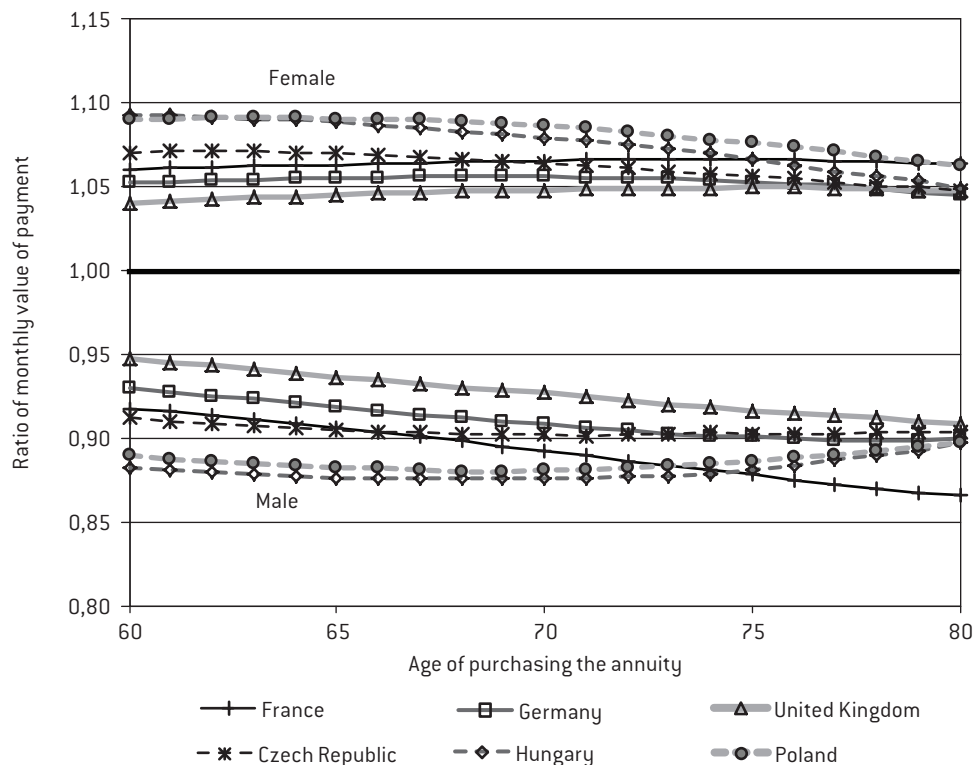
The following figures present the influence of the ban on differentiating premiums and benefits according to gender for three EU countries with the highest gross written premiums (France, Germany and the United Kingdom) and for three countries from Central and Eastern Europe with the highest gross written premiums (Czech Republic, Hungary and Poland). Figure 3 displays the above changes for the value of the net monthly premium for a whole life insurance cover purchased at the age of 20–60 with a fixed sum insured. The changes in monthly payments from life annuities purchased at the age of 60–80 with a fixed single net premium are given in Figure 4.

Figure 3. Whole life insurance—the ratio of the net monthly premium calculated on the basis of the unisex life tables to the net monthly premium calculated on the basis of the separate life tables for males and females in the selected EU countries (fixed sum insured, technical insurance rate 3%, life tables for 2009)



Source: own elaboration on the basis of life tables from the HMD.

Figure 4. Whole life annuity—the ratio of the monthly payment calculated for the unisex tables to the monthly payment for the life tables for males and females in the selected EU countries [fixed value of net premium, technical interest rate 3%, life tables for 2009]



Source: own elaboration on the basis of life tables from the HMD.

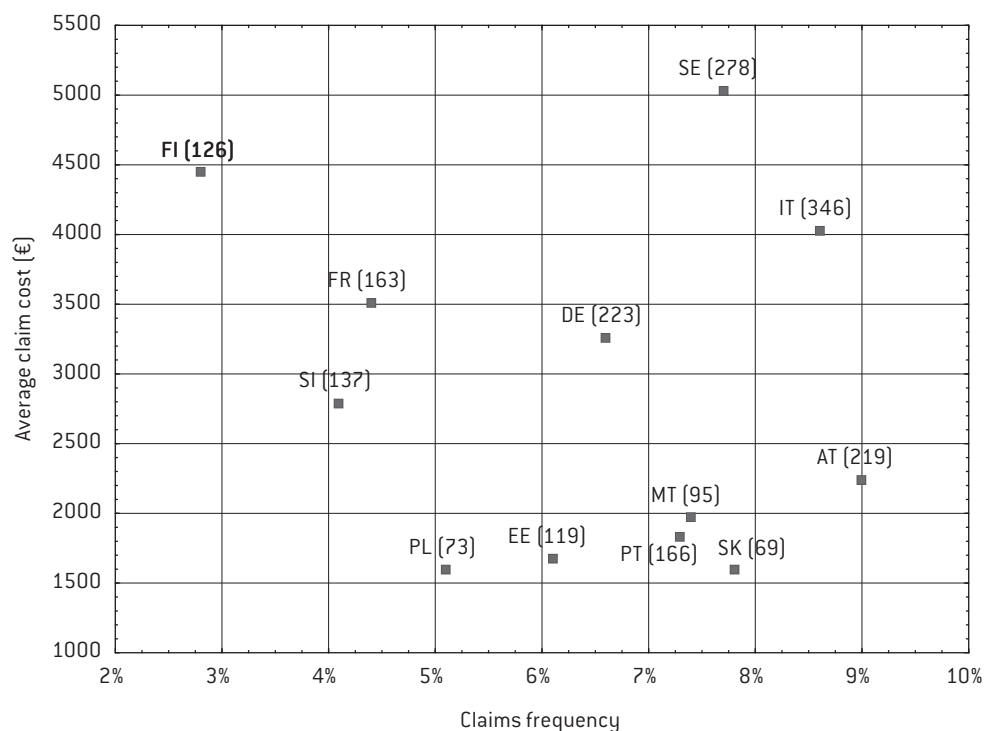
To sum up, Central and Eastern European countries are characterized by larger male-female differences in mortality (Figure 1 and Table 1), so as a result, the introduction of the ban on the use of gender as a risk factor in insurance will cause relatively greater changes in net premiums in these countries (Table 2). The calculations have been done on demographic data concerning the selected EU countries. Due to the selection made by insurers in the underwriting process, the diversity of populations in male-female differentials in mortality can be smaller, but cannot be avoided. The presented calculations show the maximum span of changes for monthly premiums in life insurance and monthly payments for whole life annuities.

4. Gender as a risk factor in motor insurance

For motor insurance, first of all, insurers face the risk that an insured driver causes an accident. Due to the fact that the MTPL insurance is obligatory in all the EU countries, this type of non-life insurance plays the most important role on the insurance market. Premium calculations in non-life insurance are coupled with claim costs. Claim costs depend on the probability that an insured

driver makes a claim and on the average cost of a claim. Multiplying the average claim cost by the claims frequency makes it possible to determine the net risk premium. The net premium plus operating expenses is equal to the total premium. The price paid by the policyholder is also affected by different national taxes and levies and other country-specific legislation.¹⁵ Net risk premiums show disparities between the countries (Figure 5).

Figure 5. The average claim cost (€), claims frequency and net risk premium (in brackets) for both male and female drivers in the selected EU countries (CEA members) in 2007



Source: own elaboration on the basis of "The European Motor Insurance Market," CEA Statistics N°38, February 2010, 37.

Different levels of the net risk premium may result from different claim frequencies or different average claim costs. Therefore, a decrease in one of the two factors may have a different impact on the net risk premium in the investigated countries, depending on the level of the other factor. The task of insurers is to precisely evaluate these two factors. By accumulating statistical data, insurance companies find out that some characteristics are associated with a systematically more frequent occurrence of the risk they wish to insure.

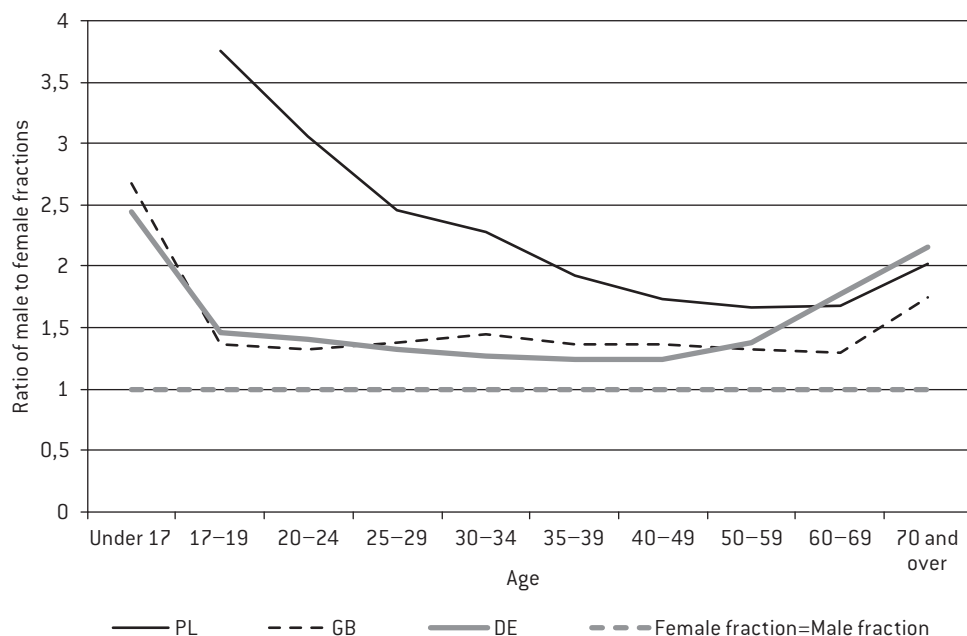
Insurance companies use numerous risk factors in pricing motor insurance. These factors are vehicle properties, environmental factors and the characteristics of the driver. Among the last ones, a driver's claims history, age and gender have been employed most frequently. Statistical

15. CEA Insurers of Europe, "The European Motor Insurance Market," *CEA Statistics* 38 (2010): 37.

data provide evidence that age and gender taken together are one of the most important risk factors for motor insurance¹⁶

Figure 6 shows the ratio of male to female fractions of drivers causing accidents in three countries: Poland, Great Britain and Germany. The last two countries have been chosen because they are the biggest insurance markets in Europe. The fractions of drivers causing accidents are quotients of the number of drivers causing accidents and the number of issued driving licences. The data for the UK and Germany are from the year 2009, and for Poland from the year 2006. As it is shown in Figure 6, male drivers have a higher frequency of claims than female ones in all age groups. In Poland the frequency of accidents caused by 17–19-year-old drivers is 3.7 times higher than for female drivers at the same age. In Germany and Great Britain the above ratio is much smaller and equals 1.3 and 1.4 respectively. The lowest ratio is for the age group of 19–69 for Germany and Great Britain. For Polish drivers the ratio decreases until the age of 69 and then increases. Therefore, besides gender, age is also a crucial risk factor. As it is shown in the report prepared by Oxera¹⁷ both young drivers (under 25 years) and elderly drivers (above the age of 70) have a higher frequency of claims and a higher average cost per claim. The conclusion is that male drivers, especially the young ones, should pay higher premiums.

Figure 6. The ratio of male/female fractions of drivers causing accidents in the United Kingdom, Germany and Poland



Source: own calculations based on data from national statistics.

16. Oxera, "Why the use of age and disability matters to consumers and insurers," [Oxera, 2012], 30, cf. "The impact of a ban on the use of gender in insurance," European study conducted by Oxera, December 2011, www.oxera.com.

17. Oxera, "Why the use," 30.

Until December 2012, in most of the EU countries, insurers charged higher premiums from young male drivers than from female drivers at the same age. For instance, for a twenty-year-old male driver the increase in premium was from 19 per cent in Germany to 60 per cent in the UK (as compared to a female driver at the same age).¹⁸ In comparison to a forty-year-old driver, the increase for a twenty-year-old male driver was 60 per cent in Germany and 12 per cent in the UK; whereas for the female driver the figures were 40 per cent and 50 per cent, respectively. Belgium and the Netherlands were pioneers in unisex pricing. They introduced the ban in 2008. As a result, insurers put greater emphasis on age as a risk factor, increasing the difference in premiums between young and older drivers. Moreover, unisex premiums were not calculated as the average of the premiums previously imposed on males and females but rather approximated the highest values. Irrespective of unisex pricing, there are differences in the frequency of accidents and their severity for males and females.¹⁹ Hence, the ban on the use of gender in determining motor insurance premiums would result in a redistribution of premiums, with lower-risk consumers paying more. The range of the differences in particular countries will depend on the percentage of female drivers and their driving habits.

Conclusions

In life and motor insurance gender is a significant risk factor. The risk of death in life-insurance is higher for males than for females. Demographic data show high excess of male mortality at the age from 20 to 80 years. In motor insurance the risk of causing a car accident is much greater for young male drivers than for female drivers at the same age. Statistics concerning different countries confirm this hypothesis. Moreover, the unisex pricing of premiums and benefits will cause various levels of changes in the EU countries. As it is shown in the above-mentioned examples, the greatest effects can be observed in Central and Eastern Europe. Gender equal treatment legislation can have the effect of hindering sound risk management by companies that offer protection against the hazards of life.²⁰

It is worth mentioning that the example of US mortgage loans crisis shows that public policies against discrimination have actually been one of the factors contributing to the current recession.²¹ In some EU countries this lesson should be treated more seriously than in others.

References

- Bowers, N. L., Gerber H.U., Hickman J., Jones D., and Nesbitt C. J., "Actuarial mathematics," Schaumburg, Illinois: The Society of Actuaries, 1997.
- Brown, R. L., "Introduction to the Mathematics of Demography," Winsted, Connecticut: AXTEX Publications, 1993.

18. Oxera, "The impact," 18.

19. Ibidem.

20. V. Petkantchin, "EU anti-discrimination policy's impact," 155.

21. Ibidem, 155.

- 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 *Official Journal of the European Union*, 21 Dec. 2004, L 373.
- Doeringhaus H. L., Schmit J.T., and Yeh J., "Age and Gender on Auto Liability Insurance Payouts," *The Journal of Risk and Insurance* 75 3 (2008): 527–550.
- "Fahrerlaubnisse. Fahrerlaubniserteilungen in Jahr 2011," Kraftfahrt-Bundesamt, KBA, 2012.
- Finkelstein A., and Poterba J., "Adverse Selection in Insurance Markets: Policyholder Evidence from the U.K. Annuity Market," *NBER Working Paper* 8045 (2000).
- Ernst & Young, "Gender-neutral insurance," March 2012. www.ey.com.
- Gerber H.U., "Life Insurance Mathematics", Zurich: Springer, 1990.
- Glei D. A., and Houriuchi S., "The narrowing sex differential in life expectancy in high-income populations: Effects of differences in the age pattern of mortality," *Population Studies* 61, 2 (2007): 141–159.
- Jackowska B., and Wycinka E., "Znaczenie wyroku Trybunału Sprawiedliwości Unii Europejskiej z dnia 1 marca 2011 r. w wybranych ubezpieczeniach życiowych i majątkowych," *Wiadomości Ubezpieczeniowe* 3 (2012): 5–15.
- Lonczak H.S., Neighbors C., and Donovan D.M., "Predicting risky and angry driving as a function of gender," *Accident Analysis and Prevention* 39 (2007): 536–545.
- Petkantchin V., "EU anti-discrimination policy's impact on insurance risk management: A parallel with the US sub-prime crisis," *Pensions* 15, 3 (2010): 155–160.
- CEA Insurers of Europe, "The European Motor Insurance Market," *CEA Statistics* 38 (2010): 37.
- The Human Mortality Database*. www.mortality.org.
- Oxera, "The impact of a ban on the use of gender in insurance," *European study conducted by Oxera*, December, 2011. Accessed September 10, 2012. www.oxera.com.
- Thierry Y., and Van Schoubroeck C., "Fairness and Equality in Insurance Classification," *The Geneva Papers* 31 (2006).
- Torella E., "On lies and statistics: the relationship between gender equality and insurance," *ERA Forum* 12 (2011): 59–70.
- "Trwanie życia w 2011 r.," Warszawa: GUS, 2012.
- "Verkehr. Verkehrsunfälle 2011," Wiesbaden: Statistisches Bundesamt, 2012.
- Oxera, "Why the use of age and disability matters to consumers and insurers," Oxera, October 2012. Accessed June 18, 2013. www.oxera.com.

Porównanie efektu ujednolicenia ze względu na płeć składek i świadczeń ubezpieczeniowych w Polsce i wybranych krajach Unii Europejskiej

21 grudnia 2012 r. wprowadzony został w Unii Europejskiej zakaz różnicowania składek i świadczeń ubezpieczeniowych ze względu na płeć. Spodziewano się, że wprowadzenie zakazu spowoduje negatywne konsekwencje zarówno dla rynku ubezpieczeń, jak i dla samych ubezpieczonych. W celu oszacowania potencjalnych skutków zmian, które niesie za sobą wprowadzenie zakazu, przeprowadzonych zostało szereg badań empirycznych. W niniejszym artykule poddano analizie terytorialne zróżnicowanie efektów stosowania jednakowych składek i świadczeń w ubezpieczeniach na życie oraz w ubezpieczeniach komunikacyjnych. Różnice w umieralności analizowano w 22 krajach UE na podstawie danych

demograficznych z *The Human Mortality Database* oraz Głównego Urzędu Statystycznego. Ryzyko spowodowania wypadku komunikacyjnego oceniano na podstawie danych statystycznych dotyczących liczby kierowców powodujących wypadki drogowe oraz liczby czynnych praw jazdy w trzech wybranych państwach: Polsce, Niemczech i Wielkiej Brytanii.

W artykule wykazano, że kraje Europy Środkowo-Wschodniej charakteryzują się wyższą nadumieralnością mężczyzn, co powoduje większe zmiany składek netto wyznaczanych bez względu na płeć w porównaniu do składek wyznaczanych dla obu płci oddzielnie. W ubezpieczeniach komunikacyjnych prawdopodobieństwo spowodowania wypadku drogowego oraz średni koszt szkody są zróżnicowane regionalnie. We wszystkich analizowanych krajach ryzyko spowodowania szkody jest większe dla młodych mężczyzn niż kobiet, natężenie tego zjawiska jest jednak zróżnicowane terytorialnie. Wprowadzenie zakazu różnicowania składek komunikacyjnych ze względu na płeć może skutkować różnym poziomem zmian wysokości składek dla kobiet i mężczyzn w poszczególnych państwach. W powyższych analizach nie uwzględniono efektów innych potencjalnych zmian procedury oceny ryzyka, które mogą zostać wprowadzone przez zakłady ubezpieczeń w odpowiedzi na zakaz różnicowania składek i świadczeń ze względu na płeć.

Słowa kluczowe: ryzyko ubezpieczeniowe, płeć, ubezpieczenia na życie, ubezpieczenia komunikacyjne.

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Factors affecting the demand for index-based agriculture insurance in Poland¹

The growing number of catastrophic occurrences is leading more and more insurance companies to refrain from offering traditional insurance products. The purpose of this study is to examine the factors affecting Polish farmers' acceptance of a completely new proposition on the Polish market – index-based insurance against drought. Farmers' acceptance was identified on the basis of a two-stage direct survey, the first covering opinions about the new structure of insurance products, and the next looking at purchasing decisions. A correlation between the area of residence and the level of interest in the new product was detected thanks to a multinomial logit model. On the other hand, the survey indicates hardly any correlation between farmers' decisions and numerous other particular variables – thus suggesting that their approach to drought is very individualistic. Acceptance of the index structure was much higher than willingness to purchase it. The government's engagement in index-based insurance in the form of a premium subsidy seems therefore indispensable.

Key words: drought, insurance in Poland, index-based insurance, contingent valuation, willingness to buy.

Introduction

Recently, the expectations of Polish farmers regarding crop insurance have been rising due to hard-to-accept variability in weather conditions (water shortages on the one hand, excessive humidity on the other). There are more and more common demands for well-structured insurance against drought. At the same time, as insurance companies face these new risks they are asking for higher insurance premiums. Further affecting the raise in premiums are difficulties in claims settlements. The proper calculation of compensation depends on when the drought occurred, whether

1. This article was created within the framework of the implementation of the research project No. N N113 432037, financed by the NCN.

it was drought alone that affected the yield and deciding what the yield for a particular crop to be expected in a given year should be considered².

Therefore, due to numerous possible complications, index-based insurance is becoming an increasingly popular option considered in many countries, including Poland³.

What must be emphasized is that many types of agricultural insurance result in tremendous losses to insurance companies in particular years. The last three years [2009–2012] in Poland are a very good example. The total number of claims made in each of these years on agricultural insurance exceeded 50,000 cases, and the total payout was much higher than the level of collected premiums (in crop insurance). Making things worse was the fact that in Poland loss calculation and payment must occur within 30 days of a claim.

Aligned with the Common Agricultural Policy (CAP), both Polish and other European governments have invented a range of various instruments to support and subsidise farmers⁴. There are direct subsidies based on the number of arable hectares, as well as other instruments allowing farmers to consciously manage risk⁵. Since 2006, the government has been subsidising 50 per cent of the premiums paid by farmers, which has resulted in a significant rise in the number of farmers ready to buy insurance. To illustrate this, it is enough to mention that in 2005 there were 36,000 crop insurance contracts⁶, while after the introduction of subsidised insurance in 2006 this number increased to 50,000⁷, 99,500 in 2007⁸, at least as many as 1.7 million in 2011⁹. The subsidy is applied, however, only if the premium rate does not exceed 6 per cent of the crop value. In the case of drought insurance, insurers offer as much as 10 per cent of the crop value, which is often far beyond the farmers' budgets¹⁰.

In 2008, there was a catastrophic drought in Poland. According to the estimates of the Institute of Soil Science and Plant Cultivation (IUNG) in Puławy, in one of the six-decade periods for which climatic water balance index is calculated, 58 per cent of spring crops area and 42 per

2. M. Kaczala, K. Lyskawa, "Ubezpieczenia z dopłatami z budżetu państwa jako instrument ochrony gospodarstw rolnych przed skutkami ryzyka," in: *Gospodarka i finanse*, red. W. Przybylska Kapuścińska, Wyd. Uniwersytetu Ekonomicznego w Poznaniu 2008, s. 123–145.
3. J. Preś, "Zarządzanie ryzykiem pogodowym," CeDeWu, Warszawa 2007.
4. E. Berg, J. Kramer, "Policy options for risk management, in: *Income stabilisation in European agriculture. Design and economic impact of risk management tools*," red. M.P. Meuwissen, M.A.P.M. van Asseldonk, R.B.M. Huirne, Wageningen Academic Publishers, 2008.
5. "Managing Risk in Agriculture. Policy assessment and design," OECD, Paris 2011.
6. "Biuletyn roczny. Rynek ubezpieczeń 2005 (dane zweryfikowane)," cz. D: *Sprawozdanie statystyczne*, KNUiFE, Warszawa 2005, http://www.knf.gov.pl/opracowania/rynek_ubezpiezen/Dane_o_rynku/Dane_roczne/%20rocznik3.html.
7. "Biuletyn roczny. Rynek ubezpieczeń 2006," cz. I: *Przegląd rynku*, KNF, Warszawa 2006, http://www.knf.gov.pl/opracow-%20ania/rynek_ubezpiezen/Dane_o_rynku/Dane_roczne/archiwum.html.
8. "Biuletyn roczny. Rynek ubezpieczeń 2007," cz. 5: *Sprawozdanie statystyczne KNF-02*, KNF, Warszawa 2007, http://www.knf.gov.pl/opracowania/rynek_ubezpiezen/Dane_o_rynku/Dane_roczne/archiwum.html.
9. A. Janc, "Trudności w funkcjonowaniu ubezpieczeń upraw i zwierząt gospodarskich w Polsce w latach 2006–2012," referat wygłoszony na konferencji *Trendy w ubezpieczeniach rolnych w Europie. Ubezpieczenia ryzyka suszy w Polsce*, Warszawa 5.11.2012.
10. A. Szelałowska, "Financial Provisions and Capabilities of The State and EU Budget as Regards Supporting The Agriculture Insurance System," prezentacja na *Conferencia Internacional Gestión de riesgos y crisis en el seguro agrario*, Madryt 2010, <http://www.agroinsurance.com/files/publications/ALEXANDRA%20SZELAGOWSKA.pdf>.

cent of winter crops area was threatened with drought. The time between 11 May and 10 July, when plants' demand for water is the highest, was extremely difficult. In many regions, plants did not propagate properly or could not develop spikes. Farms located on weak soil suffered the greatest losses.

This is why it is necessary to look for solutions that will make it possible to establish a kind of insurance enabling farmers to consciously manage risk on their farms. At the same time, the new insurance should allow insurers to function for the long-term in the crop insurance market with suitable profitability.

What makes drought insurance difficult is the fact that, due to climate change, drought occurrence in some regions of Poland is almost a certainty. According to IUNG analyses, in some parts of Poland where the soil quality is poor, drought is due to occur every two years. Therefore, insurance companies will not offer any insurance at all or the premium will be too high for farmers to accept.

Index-based insurance provides a plausible tool to solve the problem of drought insurance or insurance of animal and plant production. Some countries¹¹, including Austria, Mongolia and Mexico, have already implemented such a system. The first step is always to define the parameters to serve as the basis for compensation payment. These are usually determined by various external bodies, such as administrative bodies or scientific institutes. In the case of drought, the parameters might be, for instance, the actual amount of rainfall over a period of time, air temperature over a given period or, like in Poland, the value of climatic water balance. When the indicator falls below a determined level, it results in crop losses and accordingly leads to a payment of a flat-rate benefit, which unfortunately may not cover the whole of the loss.

Index-based insurance, above all, has quite a few undeniable advantages. Underwriting and administrative costs are lower due to the fact that individual farms do not have to be inspected. Also, there is no need for profit or crop loss adjustment because it is enough to measure the index. Another merit is that interested customers range from farmers to suppliers, banks and consumers; in other words, all parties whose profit is related to the amount of rainfall. As a result, index-based insurance may cover otherwise uninsurable occurrences or minimise the cost of insurance.

The key element for a proper index-based insurance system to be established is to obtain detailed historical data concerning an examined phenomenon. In the course of building the model and calculation of the assumed crop loss, it is crucial to consider both global and local climatic and weather trends, as well as seasonal weather trends.

The main problem connected with the use of index-based insurance is the "basis risk", which denotes the discrepancy between product basis and the genuine risk parameters that a particular entity is to be protected from¹². In this article, the product basis is the climatic water balance index that has been calculated by IUNG since 2006.

11. P. Hazell, J. Skees, "Insuring against Bad Weather. Recent Thinking," styczeń 2005, http://www.spanish.microfinancegateway.org/files/40424_file_34.pdf.

12. L.L. Golden, W. Mulong, C.C. Yang, "Handling Weather Related Risk Throughout the Financial Markets: Considerations of Credit Risk, Basis Risk, and Hedging," *The Journal of Risk and Insurance*, 2007, vol. 74, no.2, s 319–346.

1. The climatic water balance and description of data collection

The Climatic Water Balance (CWB) index is the main drought-monitoring tool in Poland, additionally including soil's water retention qualities. The CWB index meets the requirements of index-based insurance systems because it defines the potential yield losses against the average conditions. Soil conditions must also be considered because Poland is strongly diversified, especially regarding soil water retention qualities. Consequently, identical rainfall deficit and growth of plants can vary dramatically depending on the soil category¹³.

CWB expresses the difference between precipitation and potential evapotranspiration.

$$\text{CWB} = P - \text{ETP} \quad (1)$$

Where:

CWB – Climatic Water Balance

P – precipitation in a given period (2)

ETP – Penman evapotranspiration in a given period (3)

Meteorological stations measure precipitation while the value of potential evapotranspiration (expressed as approximate capacity of the evaporation of the water from living short grass) is calculated by means of the Penman method. This value can also be precisely evaluated by the use of simplified models, which include meteorological elements that are normally measured by meteorological stations in Poland.

In order to classify agricultural drought, the entire complex of weather and soil conditions is taken into consideration.

According to the definition specified in the Act, drought is defined by damage caused by the occurrence of a climatic water balance (CWB) below a defined value for an individual species or groups of cultivated plants as well as the soil category in any (60 day) period from 1 April to 30 September of that year¹⁴.

The drought index product has been set up on the basis of CWB indications, thus meeting the following requirements:

Threshold = CWB reaches the defined value, which causes damage exceeding 50%, of the 10 year average yield for a given crop in a province (1)

Claim payment per 1 ha = 10 year average price for 1 t of a given crop in a province*claim payment rate (2)

Claim payment rate = $\begin{cases} 1 & \text{for wheat} \\ 10 & \text{for sugar beets} \\ 0,75 & \text{for rapeseed} \end{cases}$ (3)

13. J. Kozyra, et.al. "Agricultural Drought Monitoring Systems (ADMS) – including crop specific requirements and soil map for the detection of areas affected by drought in Poland," w: *Impact of Climate Change and Adaptation in Agriculture. Extended Abstracts of the International Symposium*, red. J. Eitzinger, G. Kubu, University of Natural Resources' and Applied Life Sciences (BOKU), Vienna 2009, s. 37–39, <http://www.boku.ac.at/met/report>.

14. System monitoring suszy rolniczej 2011. Serwis internetowy prowadzony przez Instytut Uprawy Nawożenia i Gleboznawstwa – Państwowy Instytut Badawczy (IUNG-PIB) na zlecenie Ministerstwa Rolnictwa i Rozwoju Wsi, <http://www.susza.iung.pulawy.pl/>.

This is what was presented for the farmers to evaluate. Primary data was gathered on the basis of a survey conducted in March 2012 by means of CATI method, using the structured questionnaire schedule, on a focus group of 750 farmers across Poland who cultivate plants. The representative sample was selected on the basis of location and farm size. There were three stages of the level of product acceptance: firstly, overall acceptance of index insurance concept was examined (OA), secondly, the acceptance when the price is given (OAP) and finally, the farmers willingness to buy the product (WTB). The sample product offered to farmers for acceptance was adapted to their primary crop.

The main problem concerning identification of factors affecting respondents' answers as well as relevance of these factors' influence, resulted from their qualitative character. It was due to the fact that both answer variants and respondents' profiles were expressed by means of different qualitative variables: binary variables, polynomial variables – both nominal and also ordinal ones.

2. Methodology

2.1 Dependent variables

According to the purpose of the study, a dependent variable was defined as the level of acceptance of the new product. Acceptance was surveyed as overall acceptance of the index insurance concept, acceptance when the price was given, and finally the farmers' willingness to buy the product at the given price. The measurement of the dependent variables is presented in table 1.

Table 1. Description of dependent variables

Dependent variables	Explanation	Measurement
Overall Acceptance (OA)	Acceptance of a new index-based insurance product concept	0 – I don't like it at all or I like it a little 1 – I quite like it, I like it, I like it very much, I extremely like it
Overall acceptance when the price was given (OAP)	Acceptance of the new concept of index-based crop insurance when the price was given for this insurance	0 – I don't like it at all or I like it a little 1 – I quite like it, I like it, I like it very much, I extremely like it
Willingness to buy (WTB)	Willingness to buy the product for the farmer's dominant crop	1 – I will definitely not buy it or would rather not buy it 2 – I am not sure if I will buy it or not 3 – I might buy it or I will definitely buy it

Source: the authors' own research.

2.2 Explanatory variables

Based on the literature and our own experience, twelve factors influencing OA, OAP and WTB were selected. A detailed list of these variables, their measurement and the hypothesized relationship with the dependent variables are shown in table 2.

Table 2. Description of independent variables and hypothesized relationship

Variables	Explanation	Measurement	Hypothesized Relationship
Geographical location LOCATION P_DOLN P_KUJ P P_LUBEL P_LUBUS P_LODZ P_MALOP P_MAZOW P_OPOL P_ODKARP P_ODLAS P_OMOR P_SLAS P_SWIET P_WAR_MAZ P_WLKP P_ZACHPO	Farm location { 16 provinces): Lower Silesia, Kujawy-Pomerania, Lublin, Lubuskie, Łódź, Małopolska, Mazovia, Opole, Podkarpacie, Podlasie, Pomerania, Silesia, Świętokrzyskie, Warmia-Masuria, Wielkopolska, West Pomerania	1 – if a farm is located in a given province 0 – otherwise	Location of a farm in one of the nine provinces: Lower Silesia, Kujawy-Pomerania, Lubuskie, Łódź, Mazovia, Podlasie, Świętokrzyskie, Wielkopolska, West Pomerania increases OA, OAP and WTB levels
Farm size FARM_SIZE	Number of hectares owned	<1 ha-7 ha) <7 ha-20 ha) above 20 ha	The larger the farm size, the higher the OA, OAP and WTB levels
Acceptable level of yield loss against the target ACCEPT_LOSS	The level of yield loss that the farmer considers as unthreatening to the farm's operations	0 – No loss is acceptable 1 – up to 10% of yield loss 2 – <10%-30% of yield loss 3 – <30%-50% of yield loss 4 – over 50% of yield loss	The lower the level of yield loss acceptance, the higher OA, OAP and WTB levels
The level of yield loss leading to bankruptcy NACCEPT_LOSS	The level of yield loss that the farmer considers to be the reason for the bankruptcy of the farm	0 – No loss is acceptable 1 – up to 10% of yield loss 2 – <10%-30% of yield loss 3 – <30%-50% of yield loss 4 – over 50% of yield loss	The lower the level of loss absorbable by the farm, the higher the OA, OAP and WTB levels
Core production SPECIALIZ SPEC_PLANT SPEC_MILK SPEC_LIVEST	Farm specialization: plant, milk or livestock Core production of the farm: plants, milk, livestock, no dominant production	1 – if a farm is specialized 0 – otherwise 1 – if a farm is specialized in a given area 0 – otherwise	Farm specialization in at least one area increases the OA, OAP and WTB levels Plant specialization increases the OA, OAP and WTB levels
Age of farmer AGE	Age of the farmer	≤40 {40–50> {50–60> >61	The lower the age, the higher OA, OAP and WTB levels
Level of education EDU_LEV	Farmer's educational background	1 – secondary or tertiary 2 – vocational 3 – lower secondary or none	Higher education level increases OA, OAP and WTB levels

Variables	Explanation	Measurement	Hypothesized Relationship
Farming loss experience N_PLANT_DIS N_DROUGHT N_FLOOD N_HAIL N_SPRING_FR N_WINTERKILL N_STORM N_FIRE	How many times the following types of crop damage occurred in the farm in the last 10 years: plant diseases, pest, drought, flood, hail, spring frost, winterkill, storm, fire	A discrete quantitative measure	The larger the number of flood-related damages, the lower OA, OAP and WTB levels. The larger the number of other events, the higher OA, OAP and WTB levels
Potential area of drought DROUGHT_AREA	Farm location in a drought prone area in Poland, i.e. in certain municipalities	1 – if a farm is located in a drought area 0 – otherwise	Location of a farm in the drought-prone area increases OA, OAP and WTB levels
Insurance history ANY_INSUR INSUR_DROUGHT INSUR_HAIL INSUR_WK INSUR_SFROST INSUR_FIRE INSUR_FLOOD	Crop insurance in the previous year Types of perils insured: drought, hail, winterkill, spring frost, fire, flood	1 – if the farmer insured the crops in the previous year 0 – otherwise 1 – if insurance covered the peril 0 – otherwise	Having traditional crop insurance increases OA, OAP and WTB levels Having drought and spring frost insurance increases OA, OAP and WTB levels
Type of crop: RAPE WHEAT W_BARLEY TRITICA RYE OATS S_BARLEY MAIZE S_BEETS	Range of cultivated crops, i.e., rapeseed, winter wheat, winter barley, winter triticales, rye, oats, spring barley, maize, sugar beets in the last two years	1 – if the farmer cultivated a given crop 0 – otherwise	Cultivation of rapeseed, winter wheat or sugar beets increases OA, OAP and WTB levels
Sources of living SOURCELIV	Amount of farming income within the total income of the farm	A continuous quantitative measure of <0, 100> range	The higher the amount of farming income in the total income, the higher OA, OAP and WTB levels

Source: authors' own research.

2.3. Research procedure and methodology

The research was carried out in two stages. The aim of the first phase was to verify the initially proposed hypotheses about existence of factors influencing:

- the respondents' opinions [OA, OAP] regarding the new form of drought insurance
- the decision whether or not to buy it [WTB].

The identification of these factors validates the attempt to create a tool that will enable classification of farmers into those who are likely to become interested in the new product and those who will not show any interest at all. Such an attempt was made during the second stage of research, and its quality was evaluated on the basis of hit ratio and the usability of this tool for insurance companies.

Because the variables analysed were mainly qualitative, the classical measures of correlation could not be used (or applied) in the first stage of the study. The classical matrix of mutual correlations was

replaced by a matrix of research results referring to dependence between two particular variables, and methods of testing for independence between these variables were adapted to their character.

As for all the potential qualitative variables measured either on the nominal or ordinal scales, the test of independence was applied, $\chi^2 z (K1-1)*(K2-1)$ where $K1$ and $K2$ mean the number of possible qualitative variables > variants, whose correlation is examined. Hence, it was possible to show which characteristics of respondents (including their farms) affect their opinion about the insurance product.

Whenever qualitative variables were either nominal or ordinal, the chi-squared test for independence was applied (where test statistic is χ^2 with $(K1-1)*(K2-1)$ degrees of freedom, where $K1$ and $K2$ mean the number of possible qualitative variants of variables). Hence, it was possible to show which characteristics of respondents (including their farms) have significant influence on their opinion about the insurance product.

The strength of this correlation was established on the basis of Cramer's coefficient, which relies on empirical value of χ^2 -statistics¹⁵.

When dependence between the opinion about the product and the quantitative variables (e.g., the number of losses for different reasons, the amount of income obtained from farming) was established, the applied methods depended on the number of possible opinion variants. When there were two variants of opinion (whether they liked the notion or not – in OA and OAP case), the parametric t-test for equality of means was applied to decide about the relevance of the relationship between the opinion about the product and the value of quantitative variable. As the distribution of quantitative variables was unknown (and might not be normal), the nonparametric Mann-Whitney's U-test was additionally applied.

If there were three variants of opinion (won't buy / don't know / will buy - as it was with WTB), an ANOVA analysis based on F statistics was applied to decide about the significance of the influence of a given variable on a customer – ANOVA provides a statistical test of whether or not the means of several groups are all equal, and therefore generalizes a t-test to more than two groups¹⁶. And similarly, a non-parametric equivalent of ANOVA, the Kruskal-Wallis test, was used as supplementary to parametric tests.

In all cases, the direction of correlation was established either on the basis of empirical numbers against hypothetical numbers (when the chi-squared test was applied) or on basis of the average values of a feature (when one variable was qualitative).

The choice of method in the second stage of research (creating a tool for farmer classification) was strictly related to the fact that explanatory variables were not normally distributed (most of the factors were ultimately described by means of qualitative variables, including dummy and binary ones). Thus the choice of the classifying tool was rather limited. In particular the application of linear discriminant analysis had to be given up, and the selection was made up of classification methods that do not require a specific distribution of variables describing the classified objects. A decision was made to use the probability model, specifically the binomial logit model (for OA and OAP) and the polynomial logit model for ordinal categories (in the case of WTB) – with the awareness that it was also possible to obtain similar results using the probit model. The models were estimated with use of the maximum-likelihood method in GRETl and variable selection was based

15. H. Cramer, "Metody matematyczne w statystyce," PWN, Warszawa 1958 oraz Y.M. Bishop, S.E. Fienberg, P.W. Holland, "Discrete Multivariate Analysis: Theory and Practice," M.I.T. Press, Cambridge 1975.

16. A.D. Aczel, "Complete Business Statistics," PWN, Warszawa 2000, s. 388–454.

on a backward stepwise variable selection procedure, where a 10 per cent level of significance was assumed. The evaluation of model quality was made on the basis of the hit ratio (HR) in the training set. In each case it was verified whether the calculated hit ratio was higher than what could be achieved by chance – for this purpose the t-statistic was properly calculated and marked as t_{HR} .

It should be noted that there are numerous examples of research where application of these models has resulted in accurate classifications¹⁷.

3. Empirical results

The results obtained to verify the influence of the first seven factors on the level of product acceptance are presented below (Table 3). In the course of this data analysis, it should be remembered that wherever the p-value level was low (and the trust level equals $1 - \{p\text{-value}\}$), one could conclude that a given factor did have an influence on the opinion about the insurance product. It was noticed that 46.7 per cent of all farmers in this research accepted this concept of index insurance (OA). After the price information, the acceptance rate fell to 43.7 per cent (OAP). However, willingness to buy the product was declared only by 6.7 per cent of farmers.

Table 3. P-values for the chi-squared test for independence between product acceptance and particular variables

Study variant	Variable													
	LOCATION		FARM_SIZE		ACCEPT_LOSS		NACCEPT_LOSS		SPECIALIZ		AGE		EDU_LEV	
	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient	p-Value	Cramer's coefficient
OA	0.003	0.214	0.711	0.030	0.392	0.076	0.142	0.085	0.488	0.068	0.022	0.123	0.004	0.133
OAP	0.152	0.166	0.367	0.052	0.371	0.078	0.026	0.111	0.034	0.118	0.709	0.054	0.005	0.132
WTB	0.217	0.154	0.110	0.070	0.194	0.089	0.993	0.022	0.186	0.087	0.198	0.086	0.527	0.058

Source: the authors' own research.

First of all, the connection between a farm's location and the opinion about the new construction of insurance product turned out to be statistically relevant, but not highly relevant (based on Cramer's V coefficient). At the same time, the more information was given to the respondents, the less important the studied correlation turned out to be. Ultimately, there was no influence of farm location on the purchase decision. On the basis of the detailed analysis of the number of positive opinions against all opinions (not included in the article due to volume requirements) it could be asserted that the differentiation of opinions in various provinces was mainly due to seven out of the sixteen provinces, six of which were located in the drought area. This is where the evaluation of the concept itself was definitely well above the average.

Secondly, one can state that farm size was of no statistical relevance to the level of product acceptance. A low p-value level was gained only in the case of WTB, which may lead to a conclusion about its

17. A.M. Hackert, J.G. Tokle, "Foreign currency risk management with probit analysis", *Journal of Business Forecasting*, 1993, vol. 12, no. 1, s. 15–18; M.L. DeFond, C.W. Park, "The effect of competition in CEO turnover", *Journal of Accounting and Economics*, 1999, no. 27 [1], s. 35–56; D.G. Blanchflower, D.P. Levine, D.J. Zimmerman, "Discrimination in the Small Business Credit Market," *Review of Economics and Statistics*, 2003 no. 85 [4], s. 930–943.

correlation with the 90 per cent level of trust. It has to be said as well that the percentage of “I’ll buy” answers was the highest for the largest farms [18 per cent], and the lowest for the smallest ones [9 per cent].

Thirdly, there was no statistically relevant correlation between the opinion about the product and the level of yield loss considered as safe by the farmer. However, the level of unacceptable crop loss that could lead to a farm’s bankruptcy does have an effect on the acceptance of the index-based product. The detailed analysis of the data [also not included] allows the assertion that the highest number of positive opinions about the concept (with and without the price) was noticed for farms where the level of unacceptable loss in yield was 31–50 per cent and not above 50 per cent. A similar correlation could be noticed in willingness to purchase the product.

The further analysis of the table leads to an observation that a large influence on the level of acceptance is exerted by a farm’s specialization, which has a smaller influence on willingness to buy the product. Consequently, the detailed analysis (not included in the article) points out that focusing on plant production or milk clearly increases the chance of the product along with acceptance of the given price, while the lack of specialization evidently reduces it. Willingness to buy the product is affected by a similar correlation.

It turns out that the factors characterizing the respondent are also of significant importance (not only the information about the farm). Firstly, the concept of acceptance and (to a smaller extent) the willingness to buy an index-based product is related to the respondent’s age. It is the highest with the under 40 group and lowest with people over 61 years of age. Secondly, a higher educational background is clearly conducive to product acceptance. Unfortunately, it does not affect willingness to buy the product, which might be caused by the fact that in general very few respondents expressed the willingness to buy the product in its present form, even though it was accepted by half of them. So, it can be inferred that it is mainly financial factors that are of primary importance here.

Table 4 presents (among other data) the results of examining the correlation between the opinion about the product and the farm’s experience in terms of various occurrences. Based on that, it can be said that the opinion about the product is affected by (in the order of strength of the influence): frequency of drought, winterkill, spring frosts, hail and flood. Frequent occurrences of the first four events are conducive to positive opinions, while flood is more likely to entail a negative opinion. If the product price was given, however, it was only drought and flood frequency that mattered.

Table 4. The results of tests for equality of means of different loss experience –OA and OAP case

Frequency of occurrence	Average value of the feature in the case of “I don’t like it”		Average value of the feature in the case of “I like it”		t-Student empirical value		p-value		p-value for U-test (Manna-Whitney)	
	OA	OAP	OA	OAP	OA	OAP	OA	OAP	OA	OAP
N_PLANT_DIS	4.108	3.911	3.905	4.093	0.762	–0.680	0.446	0.496	0.775	0.145
N_DROUGHT	2.663	2.723	3.168	3.100	–3.160	–2.349	0.002	0.019	0.003	0.006
N_FLOOD	0.951	1.019	0.747	0.689	1.764	2.853	0.078	0.004	0.036	0.000
N_HAIL	0.733	0.806	0.931	0.859	–2.177	–0.575	0.030	0.566	0.193	0.988
N_SPRING_FR	3.809	3.244	3.533	3.370	–2.663	–0.741	0.008	0.459	0.001	0.075
N_WINTERKILL	2.563	2.720	3.061	2.902	–3.062	–1.114	0.002	0.265	0.001	0.042
N_STORM	0.385	0.396	0.317	0.308	0.899	1.144	0.369	0.253	0.742	0.633
N_FIRE	0.026	0.030	0.040	0.036	–0.786	–0.343	0.432	0.731	0.393	0.471

Source: the authors’ own research.

Table 5, in turn, presents the results of tests aimed at evaluation of the influence of the frequency of particular occurrences on the willingness to buy the product. Both parametric and non-parametric tests corroborate the high relevance of drought occurring on a farm. hail and hurricanes were also mentioned among the events that present some importance. In all the cases, the higher the frequency of occurrence was, the greater the seeming willingness to buy the product. Interestingly, only in the case of flood was the correlation the reverse: the higher number of positive answers was connected with a lower frequency of flood occurrence and vice versa, which is in fact statistically irrelevant.

Table 5. The results of tests for equality of means of loss experience – WTB case

Frequency of occurrence	ANOVA	Kruskal-Wallis test
	p-value for F statistic	p-value for H statistic
N PLANT DIS	<u>0.161</u>	<u>0.137</u>
N DROUGHT	0.000	0.000
N FLOOD	0.285	0.557
N HAIL	<u>0.044</u>	<u>0.109</u>
N SPRING FR	0.497	0.540
N WINTERKILL	0.487	0.237
N STORM	0.723	0.046
N FIRE	<u>0.078</u>	<u>0.150</u>

Source: authors' own research.

Table 6 presents the correlation of opinion about the product and the willingness to buy it and the farm's location in the drought area, as well as the insurance experience of the farm in terms of various adverse events. It can be concluded that the farm's location has a definite influence on the acceptance and willingness to buy the index-based product. The detailed data analysis (not included here) suggests that the farm's location in the drought area is definitely conducive to the acceptance and willingness to buy the product.

It was also the interdependence between owning traditional crop insurance (regardless of the coverage) and the evaluation of the new insurance concept that was of statistical importance, and even more so, with regard to the willingness to buy the index-based product. Seventeen per cent of those who had purchased some form of crop insurance were ready to buy the product, as opposed to 8 per cent of the farmers who weren't insured. xperience with traditional drought and spring frost insurance was of primary importance here, with 71 per cent of those who had been insured against drought stating that they liked the concept as opposed to 49 per cent of those who had never been insured against this peril.

Table 6. P-values for the chi-squared test for independence between product opinions, drought area and insurance experience

Research variant	DROUGHT AREA	INSURANCE HISTORY						
		ANY INSUR	INSUR DROUGHT	INSUR HAIL	INSUR_WK	INSUR_FROST	INSUR_FIRE	INSUR_FLOOD
OA	0.003	0.00047	0.0024	0.629	0.065	0.007	0.032	0.1369
OAP	0.00013	0.0001	0.0149	0.428	0.349	0.288	0.727	0.317
WTB	0.00002	0.0009	0.129	0.209	0.996	0.0003	0.972	0.708

Source: the authors' own research .

Table 7 presents p-values for the independence test between product acceptance and the willingness to buy it and the type of crop.

Table 7. P-values for the chi-squared test for independence between product acceptance and crop type

Research variant	Crop								
	RAPE	WHEAT	W BARLEY	TRITICA	RYE	OATS	S BARLEY	MAIZE	S BEETS
OA	0.273	0.619	0.406	0.543	0.697	0.844	0.727	0.798	0.190
OAP	0.277	0.317	0.535	0.232	0.323	0.363	0.507	0.088	0.680
WTB	0.002	0.184	0.579	0.206	0.035	0.574	0.089	0.566	0.099

Source: the authors' own research.

The cultivation of rape and sugar beets evidently increases overall acceptance for the idea of index insurance. The cultivation of maize increases the acceptance of the concept when the price is given. The cultivation of rape, beets and barley clearly raises willingness to buy the index-based product, but the cultivation of rye has the opposite effect.

From the data presented in Table 8, one can infer that the acceptance level of the index-based concept, including when the price was given, was not affected by the income structure of the farm. The only result of statistical relevance regarded the willingness to buy the product (WTB). In the ANOVA analysis, the p-value for F statistics amounted to 0.026, while in the case of the Kruskal-Wallis test, the p-value for H statistics was 0.034. The lowest average amount of income from farming in the grand scheme of the farm's income was noticed in the "will not buy" group, while the highest income was found in the "I do not know" group. Thus, the direction of the influence is ambiguous.

Table 8. Collective test results for equality of means of SOURCELIV variable - OA and OAP case

Frequency of occurrence	Average feature value in the case of "I do not like it" opinion		Average feature value in the case of "I like it" opinion		t-Student empirical value		p-value		p-value for U-test (Manna-Whitney)	
	OA	OAP	OA	OAP	OA	OAP	OA	OAP	OA	OAP
SOURCE LIV	68.663	66.584	67.219	69.185	0.615	-1.107	0.539	0.269	0.401	0.344

Source: the authors' own research.

Summing up, one can say that a number of factors with a statistically relevant influence on the acceptance level and willingness to buy the product have been identified. In the OA case, hypotheses regarding the influence and its direction of the following variables were corroborated: LOCATION, P_DOLN, P_KUJ_P, P_LUBUS, P_LODZ, P_PODLAS, P_ZACHPO, AGE, EDU_LEV, N_DROUGHT, N_FLOOD, N_HAIL, N_SPRING_FR, N_WINTERKILL, DROUGHT_AREA, ANY_INSUR, INSUR_DROUGHT, INSUR_SFROST, RAPE, S_BEETS and NACCEPT_LOSS (lacking a single direction). Regarding OAP, the hypotheses were corroborated as for the influence and its direction of the following variables: SPECIALIZ, SPEC_PLANTS, EDU_LEV, N_DROUGHT, N_FLOOD, DROUGHT_AREA, ANY_INSUR, INSUR_DROUGHT, as well as NACCEPT_LOSS (lacking a single direction). As for WTB, the influence and its direction were corroborated regarding the following variables: SPECIALIZ, SPEC_PLANTS, AGE, N_DROUGHT, N_HAIL, N_STORM, DROUGHT_AREA, ANY_INSUR, INSUR_DROUGHT, INSUR_SFROST, RAPE, S_BEETS, and SOURCE LIV (lacking a single direction). It has to be made clear, though, that despite its statisti-

cal relevance, Cramer's coefficients were not very high (as much as 0.2), so it makes it possible to infer that accurate predictions concerning a farmer's opinion about the product and his willingness to buy couldn't be made based on one variable alone. The information collected in particular variables in a single model would have to be aggregated, which would make it possible to forecast a qualitative variable, such as the customer's opinion.

In order to establish the character of the customer's opinion about the product, the qualitative variable should be expressed as a Bernoulli variable within a probability model: $Y_i = 1$ if the i -respondent's opinion is positive, $Y_i = 0$ if otherwise. The relevant independent variables and their parameters for the probability model regarding overall acceptance of the product are presented in Table 9.

Table 9. The estimates of Logit model parameters – OA case

LP	Variable	Coeff.	Std. Dev.	LP	Variable	Coeff.	Std. Dev.
1	Const.	-0.744	0.583	11	INSUR_HAIL	-0.637	0.305
2	DROUGHT_AREA	0.777	0.227	12	AGE	-0.149	0.084
3	ACCEPT_LOSS	0.345	0.136	13	EDU_LEV	0.349	0.112
4	NACCEPT_LOSS	-0.21	0.121	14	SOURCE_LIV	-0.006	0.003
5	N_PLANT_DIS	-0.057	0.023	15	P_LUBEL	0.652	0.361
6	N_DROUGHT	0.123	0.048	16	P_LODZ	-0.968	0.242
7	N_WINTERKILL	0.090	0.038	17	P_PODLAS	0.864	0.422
8	N_STORM	-0.155	0.079	18	P_WAR_MAZ	1.308	0.697
9	ANY_INSUR	0.542	0.279	19	P_WLKP	-0.526	0.250
10	INSUR_DROUGHT	0.782	0.329				
Chi-square(18) = 95,2046 [0,0000]							

Source: the authors' own research.

If the acceptance probability was above 0.5 the farmer was assigned to the accepting group, the hit rate was assumed to be about 65 per cent. However, from a practical point of view, the cost of misclassification could be rather high. Therefore, it was decided to set the level of acceptance probability as a minimum of 0.75, and if the probability was 0.25 or below, the farmer was classified as "not accepting" the product. Hence, assuming the range between 0.25 and 0.75 as uncertain, the following classification matrix was obtained: (Table 10)

Table 10. OA classification table

Actual affiliation	Classification		WT (%)
	Like it	Don't like it	
Like it	56	8	88%
Don't like it	14	40	74%
t-Stud _{WT}	6.98 [0,000]	WT >> 50%	81%

Source: authors' own research.

In the logit model, the relevant descriptive variables regarding the probability of acceptance of a product if the price is given (OAP) are presented in table 11 along with the evaluation of these parameters.

Table 11. The estimates of Logit model parameters – OAP case

LP	Variable	Coeff.	Std. Dev.	LP	Variable	Coeff.	Std. Dev.
1	Const.	-1.1636	0.3140	7	INSUR_SFROST	0.4580	0.2597
2	DROUGHT_AREA	0.9801	0.1958	8	EDU_LEV	0.3758	0.1061
3	OATS	0.3577	0.1596	9	P_LODZ	-0.6546	0.2282
4	N_FLOOD	-0.1221	0.0495	10	P_WLKP	-0.7622	0.2389
5	INSUR_DROUGHT	0.6152	0.2951	11	SPECIALIZ	-0.3723	0.1805
6	INSUR_HAIL	-0.7154	0.2565				
Chi-square(10) = 66,9775 [0,0000]							

Source: authors' own research.

Assuming the uncertainty range as 0.3–0.7, the following matrix was built:

Table 12. OAP classification table

Actual affiliation	Classification		WT (%)
	Like it	Don't like it	
Like it	73	3	96%
Don't like it	22	44	67%
t-Stud _{WT}	7,72 (p = 0,000)	WT >> 50%	82%

Source: the authors' own research.

After the estimation of the polynomial logit model along with ordinal categories, it turned out that one of the cut points was irrelevant. Therefore, the number of classes was reduced. Two classes remained: "will not buy" (1) and "I'm not sure / I'll buy" (2). The relevant descriptive variables and their parameters can be seen in Table 13.

Table 13. The estimates of Logit model parameters - WTB case

LP	Variable	Coeff.	Std. Dev.	LP	Variable	Coeff.	Std. Dev.
1	Const.	-0.0955	0.3781	5	N_DROUGHT	0.1923	0.0368
2	SPECIALIZ	-0.3126	0.1778	6	N_FIRE	1.0601	0.4679
3	ACCEPT_LOSS	0.3060	0.1304	7	S_BEETS	0.7243	0.3392
4	NACCEPT_LOSS	-0.2541	0.1169				
Chi-square(6) = 48.4784 [0.0000]							

Source: authors' own research.

Assuming the uncertainty range as 0.3–0.7, the following matrix was built:

Table 14. WTB classification table

Actual affiliation	Classification		WT (%)
	Like it	Don't like it	
Like it	37	3	93%
Don't like it	14	7	33%
t-Stud _{WT}	5,27 (p = 0,000)	WT >> 50%	72%

Source: authors' own research.

The verification of the hypothesis that the resulting hit ratio is equal to the random classification ratio (against the alternative hypothesis that it is much higher) was carried out by means of t-Student statistics¹⁸.

Conclusions

Solving the drought problem in Poland is a crucial issue for three groups of entities: the government, insurance companies and farmers. This article focuses on the results of research looking into factors affecting the levels of new product acceptance – index-based drought insurance.

According to the research findings, rather high interest in the new product was noticed (OA, OAP) as well as the willingness to buy the product (WTB) in particular areas – either those having suffered from drought in the past years or particular districts (overlapping the drought areas or neighbouring them). What might be surprising is the lack of correlation between the type of crop and the willingness to buy the product (WTB), despite the fact that some types of plants are particularly susceptible to drought in Poland (wheat, beets).

It would make sense to explain why farmers differentiate between the overall acceptance for the product and the acceptance when the price has been given. This might mean that the way in which they perceive the peril of drought is very individualistic¹⁹ (Arnoldi 2009). Other reasons may be the lack of acceptance for the offered price or possibly a varied approach to the problem of financing the consequences (it is unnecessary to purchase the index-based product because the farmer expects a different form of assistance – e.g., a compensation from the state budget).

The fact that more than half of the respondents rejected the concept of index-based insurance means that the “principle of completeness” still plays a key role. In the former socialist countries, expectations for agricultural insurance are historically established. Since full compensation in the area of agriculture was, in fact, a common practice, farmers are still used to being fully compensated for any incurred loss (e.g. expecting that compensation for hail damaged corn should correspond to the values for which the seed could be sold by the farmer).

However, one can say that a prevailing acceptance of the concept has been seen, which might open the door to its possible implementation within a government-based catastrophe-assistance programme. This research also enables us to mark any farmer as possibly or certainly interested in the index concept with 80 per cent accuracy. The main task for insurance companies would be to arrive at the final product shape depending on various factors (price, level of compensation, CWB level activating the payment). To do this, another conjoint method research²⁰ will have to be conducted, and indeed this is what the authors intend to do in the weeks to come.

18. Jr. J.F. Hair, R.E. Anderson, R.L. Tatham, W.C. Black, “Multivariate Data Analysis with Readings,” Prentice-Hall, New Jersey 1995.

19. J. Arnoldi, “Risk,” Polity Press, Cambridge 2000.

20. S. Heenkenda, “Prospective Demand for an Index-Based Microinsurance in Sri Lanka,” *Asia-Pacific Journal of Social Sciences*, 2011, vol. 1, no. 3, s. 1–31.

References

- Aczel A.D., "Complete Business Statistics," PWN, Warszawa 2000.
- Arnoldi J., "Risk," Polity Press, Cambridge 2000.
- Berg E., Kramer J., "Policy options for risk management," w: *Income stabilisation in European agriculture. Design and economic impact of risk management tools*, red. M.P. Meuwissen, M.A.P.M. van Asseldonk, R.B.M. Huirne, Wageningen Academic Publishers, 2008.
- Bishop Y.M., Fienberg S.E., Holland P.W., "Discrete Multivariate Analysis: Theory and Practice," M.I.T. Press, Cambridge 1975.
- "Biuletyn roczny. Rynek ubezpieczeń 2005 [dane zweryfikowane]," cz. D: *Sprawozdanie statystyczne*, KNUiFE, Warszawa 2005, http://www.knf.gov.pl/opracowania/rynek_ubezpieczen/Dane_o_rynku/Dane_roczne/%20rocznik3.html.
- "Biuletyn roczny. Rynek ubezpieczeń 2006," cz. I: *Przegląd rynku*, KNF, Warszawa 2006, http://www.knf.gov.pl/opracow-%20ania/rynek_ubezpieczen/Dane_o_rynku/Dane_roczne/archiwum.html. *Biuletyn roczny. Rynek ubezpieczeń 2006*, cz. I: *Przegląd rynku*, KNF, Warszawa 2006, http://www.knf.gov.pl/opracow-%20ania/rynek_ubezpieczen/Dane_o_rynku/Dane_roczne/archiwum.html.
- "Biuletyn roczny. Rynek ubezpieczeń 2007," cz. 5: *Sprawozdanie statystyczne KNF-02*, KNF, Warszawa 2007, http://www.knf.gov.pl/opracowania/rynek_ubezpieczen/Dane_o_rynku/Dane_roczne/archiwum.html.
- Blanchflower D.G., Levine D.P., Zimmerman D.J., "Discrimination in the Small Business Credit Market," *Review of Economics and Statistics* 2003 no. 85 [4].
- Cramer H., "Metody matematyczne w statystyce," PWN, Warszawa 1958.
- Golden L.L., Mulong W., Yang C.C., "Handling Weather Related Risk Throughout the Financial Markets: Considerations of Credit Risk, Basis Risk, and Hedging," *The Journal of Risk and Insurance* 2007, vol. 74, no. 2.
- Hackert A.M., Tokle J.G., "Foreign currency risk management with probit analysis," *Journal of Business Forecasting*, 1993, vol. 12, no. 1, s. 15–18; M.L. DeFond, C.W. Park, "The effect of competition in CEO turnover," *Journal of Accounting and Economics*, 1999, no. 27 [1].
- Hair Jr. J.F., Anderson R.E., Tatham R.L., Black W.C., "Multivariate Data Analysis with Readings," Prentice-Hall, New Jersey 1995.
- Hazell P., Skees J., "Insuring against Bad Weather. Recent Thinking," styczeń 2005, http://www.spanish.microfinancegateway.org/files/40424_file_34.pdf.
- Heenkenda S., "Prospective Demand for an Index-Based Microinsurance in Sri Lanka," *Asia-Pacific Journal of Social Sciences*, 2011, vol. 1, no. 3.
- Janc A., "Trudności w funkcjonowaniu ubezpieczeń upraw i zwierząt gospodarskich w Polsce w latach 2006–2012," referat wygłoszony na konferencji *Trendy w ubezpieczeniach rolnych w Europie. Ubezpieczenia ryzyka suszy w Polsce*, Warszawa 5.11.2012.
- Kaczala M., Łyskawa K., "Ubezpieczenia z dopłatami z budżetu państwa jako instrument ochrony gospodarstw rolnych przed skutkami ryzyka," w: *Gospodarka i finanse*, red. W. Przybylska Kapuścińska, Wyd. Uniwersytetu Ekonomicznego w Poznaniu 2008.
- Kozyra J., et.al. "Agricultural Drought Monitoring Systems (ADMS) – including crop specific requirements and soil map for the detection of areas affected by drought in Poland," w: *Impact*

of Climate Change and Adaptation in Agriculture. Extended Abstracts of the International Symposium, red. J. Eitzinger, G. Kubu, University of Natural Resources' and Applied Life Sciences [BOKU], Vienna 2009, <http://www.boku.ac.at/met/report>.

"Managing Risk in Agriculture. Policy assessment and design," OECD, Paris 2011.

Preś J., "Zarządzanie ryzykiem pogodowym," CeDeWu, Warszawa 2007.

System monitoring suszy rolniczej 2011. Serwis internetowy prowadzony przez Instytut Uprawy Nawożenia i Gleboznawstwa – Państwowy Instytut Badawczy (IUNG-PIB) na zlecenie Ministerstwa Rolnictwa i Rozwoju Wsi, <http://www.susza.iung.pulawy.pl/>.

Szelągowska A., "Financial Provisions and Capabilities of The State and EU Budget as Regards Supporting The Agriculture Insurance System," prezentacja na Conferencia Internacional *Gestión de riesgos y crisis en el seguro agrario*, Madryt 2010, <http://www.agroinsurance.com/files//publications/ALEXANDRA%20SZELAGOWSKA.pdf>.

Czynniki wpływające na popyt na indeksowe ubezpieczenia rolne w Polsce

Rosnąca liczba zdarzeń katastroficznych sprawia, że coraz więcej zakładów ubezpieczeń powstrzymuje się od oferowania tradycyjnych produktów ubezpieczeniowych. Celem niniejszej pracy jest analiza czynników wpływających na akceptację przez polskich rolników zupełnie nowej propozycji na polskim rynku – indeksowych ubezpieczeń suszy. Dokonano jej na podstawie dwuetapowego bezpośredniego badania: pierwszy etap obejmował opinie na temat nowej struktury produktu ubezpieczeniowego, natomiast drugi decyzję dotyczącą zakupu. Dzięki zastosowaniu logitowego modelu regresji wielorakiej zidentyfikowano korelację między obszarem zamieszkania a zainteresowaniem nowym produktem. Z drugiej strony, badanie nie wykazało prawie żadnej korelacji między decyzją rolników i licznymi zmiennymi szczegółowymi, co sugeruje, że ich podejście do suszy jest bardzo indywidualne. Akceptacja struktury indeksowej była dużo wyższa od chęci zakupu ubezpieczenia. W związku z tym zaangażowanie rządu w ubezpieczenie indeksowe w formie dopłaty do składki wydaje się niezbędne.

Słowa kluczowe: susza, ubezpieczenia w Polsce, ubezpieczenia indeksowe, wycena warunkowa, chęć zakupu.

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EWA WIERZBICKA

The significance of customer value for an insurance company

The purpose of this article is to demonstrate the importance of the impact of customer value on the value of the insurer (insurance company). Customers generate cash flow and largely determine the profitability of an insurance company. Therefore, it is necessary to identify and quantify the needs of insurance company customers and their level of satisfaction with product and service quality. Customer value for the insurer should be measured and maximized by, for example, matching products to the changing needs of the customer life cycle. Loyal and satisfied customers create value for insurance companies.

Key words: customer value, insurer, loyalty, customer relationship management CRM, customer lifetime value CLV.

Introduction

The value of an insurance franchise (insurance company or insurer) hinges on properly defining the strategically important customer segments and correctly identifying the value of these customers, as well as by skilfully managing this value.

The experience of the financial crisis and changes in the financial services justify the hypothesis that the value of financial institutions, including insurance companies, is determined not only by the quantity of capital and the potential of sales in the traditional sense (e.g., the number of branches and the number of insurance agents). Today, the key determining factors for an insurer's value are:

- the value of market segments (current and future),
- customers value (current and future),
- the ability of the insurance company to reproduce and to increase this value in subsequent cycles of the sale of insurance products.

In his book entitled *Marketing Management: Analysis, Planning, Implementation, and Control*, Philip Kotler wrote, "Appreciating and satisfying customer needs are key to success. Focusing

on customers and creating loyal relationships are very important in a world characterized not by a shortage of goods but by a shortage of customers.”¹

1. The Unique Qualities of an Insurance Undertaking as a Financial Intermediary

Insurers (insurance undertakings) are active financial intermediaries that develop proprietary products in the form of insurance services.² The operations of insurers as institutions of public trust are subject to special legal regulations and financial supervision. In Poland, the insurance sector is supervised by a state regulatory institution called the Polish Financial Supervision Authority. Its primary purpose is to enhance the safety of the operation of insurance undertakings.³ Insurers offering commercial lines, that is institutions offering life, property and casualty insurance⁴, are the subject of interest in this paper.

Commercial lines consist of, above all, non-compulsory insurance with respect to which the customer as the policyholder unilaterally determines what insurance needs they have. Compulsory insurance also exists. In this case, there is a legal requirement to take out insurance. This applies to business's liability or property insurance.

Insurance is a financial instrument whose purchase, involving the execution of a contract and the remittance of a premium, provides the insured with insurance coverage. The insurance undertaking assumes the policyholder's risk of incurring adverse economic effects of specific acts of God. An insurance policy facilitates risk transfer to an insurer. Insurers provide insurance services solely by entering into insurance contracts. Insurance products are sold directly by an insurance undertaking's employees or indirectly through other channels of distribution. Insurance agents and brokers are conventional sales intermediaries. Non-conventional channels of distribution include the sales of insurance through banks, travel agencies, car dealers, etc. Insurance is frequently offered in direct form via phone or the web, which enhances availability while attenuating the costs of distribution.

To afford financial protection to customers of insurance undertakings, there is a statutory division of insurance into life insurance (section I) and personal and casualty insurance (non-life insurance [section II]). Insurers cannot concurrently offer insurance products in both areas, as life and non-life must be separate from one another⁵. In the context of this paper, this division is of great significance as there are material differences between the customer life cycles in these two areas of insurance. In life insurance, contracts are most frequently executed for longer periods, whereby customers are attached to insurers for the long-term. At the same time, prematurely terminating these insurance contracts is

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1. P. Kotler, "Marketing Management: Analysis, Planning, Implementation, and Control," 7th Edition (Englewood Cliffs, NJ: Prentice-Hall Inc., 1991).
 2. Z. Polański, "Wprowadzenie, System finansowy we współczesnej gospodarce rynkowej," in vol. 1 of *System finansowy w Polsce*, ed. B. Pietrzak, Z. Polański and B. Woźniak (Warszawa: PWN, 2008), 32. The author classifies banks, insurance companies and mutual funds as active financial institutions and brokerage houses, factoring companies and money exchange counters as passive financial institutions.
 3. The operations of insurers are licensed. In the EU, the single-licence principle is in force.
 4. We divide insurance into social (public) and commercial (private). Social insurance is always compulsory and personal and constitutes an instrument of the state's social policy.
 5. The Insurance Activity Act of 22 May 2003, Journal of Laws No. 134, item 1151, as amended, divides insurance into two sections: life insurance (Section I) and property and casualty insurance (Section II).

very unfavourable to customers. The exit barriers and costs borne by customers are therefore higher, for instance in unit-linked life insurance. In turn, in non-life insurance, annual contracts prevail. That is why, the customer turnover rate is higher as customers may switch to the competition, or switch products or even abandon some products (temporarily or permanently). To prevent this, insurers utilize financial incentive systems. Even so, the turnover risk contributes to a lower customer value. This compels insurers to compute their retention rates for specific customer segments and groups.

The retention rate enables insurers to estimate the duration of customer loyalty. This is the ratio stated as a percentage of the number of customers at the end of a given period, for example a year, to the number of customers at the beginning of the period. On the basis of this rate one may deduce how many customers have switched to the competition. In turn, it indirectly enables one to assess the number of customers who have remained after having accepted the conditions of cooperation with a given insurer.

Despite the fierce competition on the Polish insurance market and the extensive availability of products offered by a host of insurers, the transparency of the insurance market is deteriorating from the vantage point of the consumers and customers of insurance undertakings. This is primarily the case on account of the advent of a growing number of new and difficult to comprehend insurance products covering new types of risks or a different way of insuring conventional risks.

2. The interaction between customer value, value of a customer and an insurer's value

Different valuation methods may be applied to an insurer as an insurance franchise. Choosing the valuation method depends on the purpose of the valuation, the type of franchise, the individual nature of the industry and the information available. The following valuation methods have been distinguished: asset-based, income-based, mixed and comparative valuations. Asset-based methods are amongst the oldest, which include, for example, book value. The widely used income-based methods may prove to be unreliable during an economic crisis when the income generated by a franchise falls. Corporate valuation of an insurer or a bank rendering financial services is of importance, especially in the following circumstances: prior to an IPO, during a corporate sale, merger or acquisition, when investing funds in a given company, or during privatization. Using a conventional approach to valuation may prove to be insufficient. Increasingly more often, the value of a franchise is thought to be largely driven by factors such as market position, reputation, and the capability to generate positive cash flow on customer relations. It is, therefore, important to identify the factors affecting an insurer's value as a financial intermediary and then to manage this value.⁶

The strategies pursued by insurance undertakings, just as the ones pursued by other financial institutions operating in a competitive market, must be customer-focused to meet customer needs and preferences and the conditions in which insurers operate.⁷ Insurance products must be aligned to the needs of the particular customer groups. At the same time, channels of distribution

6. P. Masiukiewicz and E. Wierzbicka, "Specifics of customer value models in financial institutions," in *Customer Value Creation, theory and practice*, ed. B. Dobiegała-Korona and P. Masiukiewicz, (Warszawa: Warsaw School of Economics Press, 2012), 141.

7. A. Szablewski, "Klient jako najważniejsze aktywo przedsiębiorstwa," *CEO: Magazyn Top menedżerów*, accessed April 3, 2011, <http://eco.cxo.pl/artykuly/druk/52077/klient.jako.najwazniejsze.aktwo.przedsiębiorstw...>

suited to the customer's convenience must be used. Multi-channel distribution produces robust results as it combines conventional sales channels with channels using a variety of intermediaries. Both areas of distribution are supported by ever more sophisticated electronic platforms through which they can communicate with customers and offer insurance products. One way of deriving a competitive edge is for an insurer to form a durable bond with its customers.⁸ Focusing on long-term customer relations, however, entails not just market segmentation and targeting customer groups, but also increasingly customization.

Customer preferences change over time as the level of income, family status, place of work, age and job vary. A financial intermediary should be able to survey customer needs precisely in order to be able to prepare a product offer fitted to the customer's life cycle. Intermediaries are more frequently acting as tutors and advisors in the selection of investment and protection strategies for their customers. To achieve a competitive edge over other insurance undertakings, therefore, requires continuous quality control and adjusting services to customers' changing financial needs and capabilities, which makes it possible to achieve customer satisfaction. At the same time, every change of product, change of customer contact method, etc., generates costs for insurance undertakings.

According to Ph. Kotler, total customer value consists not just of product value but also of the value of the company's image, staff and service.⁹

The value a customer derives is the difference between the value a product provides to a customer and the cost he or she must incur to acquire a given product. The cost incurred by a customer consists of the price, the cost of the time spent, the cost of energy consumed and the cost of mental commitment. That is why customer value should be measured by the ratio of benefits stemmed from needs satisfaction to the costs.¹⁰ The fundamental cost customers of an insurance undertaking incur is the premium, which represents the policyholder's share in covering future payments of claims and benefits.

According to Maja Szymura-Tyc, the final test which must be administered to a company's resources and competencies is the company's capability of generating "customer value – the excess benefits a customer obtains as a result of buying a product or service on top of the costs he or she must incur to acquire a given product."¹¹ In the opinion of Barbara Dobiegała-Korona, "Customer value means all the benefits a customer may capture by accepting an offer or entering into a relationship with a company."¹² To establish long-term customer relationships, insurance undertakings should enrich the range of services provided, introduce innovations and adjust them to changing customer needs, enhance product quality and the quality of service from the time of sale to claims handling or adjustment (which should proceed swiftly and seamlessly), including after-sales service. They may also incentivize customers to buy their products by employing lower prices than the competition has, including various types of relief and discounts, or they may attract customers by improving the quality of service and adjusting it to meet customer expectations for a given type of insurance service.

8. M. Mazurek-Łopucińska, "Orientacja na klienta w przedsiębiorstwie," (Warszawa: PWE, 2002), 16.

9. P. Kotler, "Marketing," (Warszawa: Rebis sp z o.o., 2005), 60.

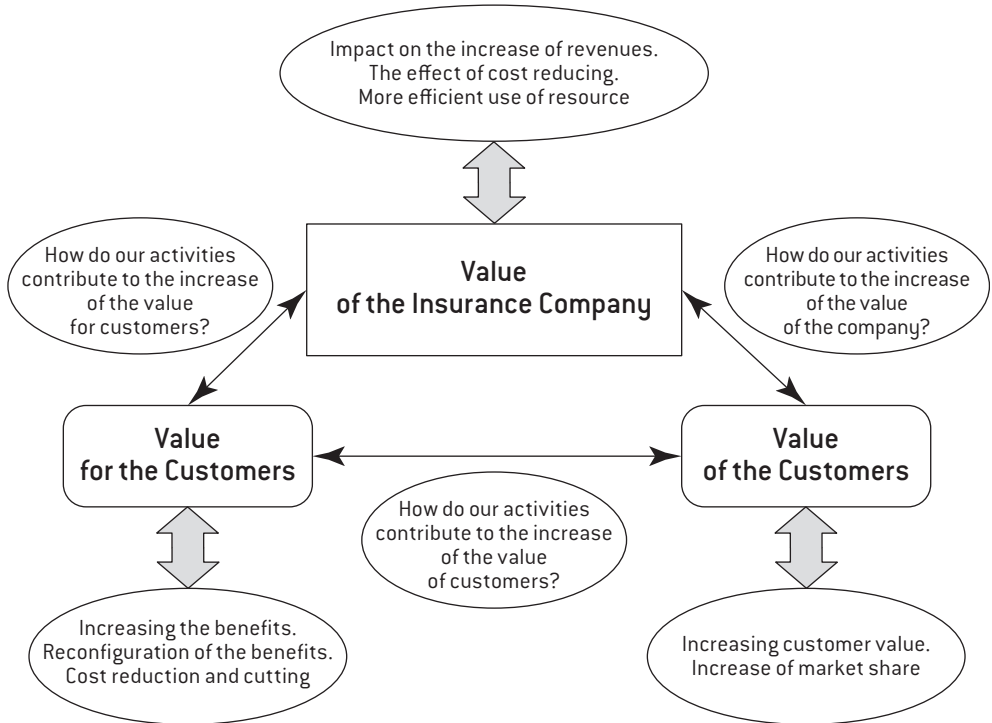
10. B. Dobiegała-Korona, "Wartość dla klienta a pozycja konkurencyjna przedsiębiorstwa," in *Zarządzanie wartością klienta, pomiar i strategię*, ed. B. Dobiegała-Korona and T. Doligalski, (Warszawa: Poltext, 2010), 234.

11. M. Szymura-Tyc, "Zarządzanie przez wartość dla klienta – budowa wartości firmy," *Instytut ZTI*, accessed March 10, 2013, http://www.zti.com.pl/instytut/pp/referaty/ref4_full.html.

12. B. Dobiegała-Korona, "Budowa kapitału klienta," in *Value Based Management, koncepcja, narzędzia, przykłady*, ed. A. Szablewski, K. Pniewski and B. Bartoszewicz, (Warszawa: Poltext, 2008), 239.

Figure 1 depicts the value spiral, including the value a company offers to its customers, the value customers generate for a company and the value of the company itself, which is driven by the value of the customers.

Figure 1. The complementary nature of value in terms of finance and marketing



Source: author's own figure inspired by: A. Adamska and T. Dąbrowski, "Marketing i finanse w przedsiębiorstwie," [Warszawa: C.H. Beck, 2007], 203.

Contemporary theories of management and marketing treat customers as a special type of capital and emphasize that the value customers provide to a company affects corporate value for all stakeholders, including owners, managers and employees.

3. The Impact Exerted by Customer Value on an Insurance Undertaking's Value

An insurer is a producer and provider of insurance services. The policy of shaping an insurer's value as a financial intermediary institution demands that the methods for valuing such an insurance franchise are properly selected. One of the contemporary methods used is to assess an insurer's value based on customer value.¹³ Customer value or Consumer Lifetime Value, CLV, signifies a customer's value over time, that is the sum total of the discounted net cash flow associated

13. I. Jędrzejczyk, "Kształtowanie wartości zakładu ubezpieczeń," in *Finansowe narzędzia zarządzania zakładem ubezpieczeń*, ed. T. Sangowski, [Warszawa: Poltext, 2005], 254.

with a given customer. By focusing on effective long-term relationships with its insured customers, an insurance franchise grows its corporate value. In insurance one may also apply the term Policyholder Lifetime Value or PLV.¹⁴

Customer value is the sum total of the discounted revenues generated by customers, adjusted by the costs an insurer incurs to acquire and retain customers. It is relatively easy to compute customer-generated revenues, especially when a firm such as an insurer has a system to track all customer transactions.¹⁵ Insurance activity expenses entail customer acquisition costs related to executing and renewing insurance contracts also including commissions for insurance intermediaries and the costs of advertising and promoting insurance products plus administrative expenses.¹⁶ To operate effectively insurers must forecast the costs of future claims and benefit payments and control and manage risk (risk management), set premiums and provisions suitable to the level of risk taken, transfer risk by insuring a larger number of customers with similar parameters. The areas of costs that have the greatest impact on an insurance undertaking's value are operating activity, distribution, tariff policy, underwriting, claims handling and investment policy.¹⁷

The objectives of insurance companies' marketing efforts are focused on identifying customer needs and expectations pertaining to insured risks, and developing new products addressed to prospective and previously-acquired customers to procure their fidelity and loyalty. It is usually more expensive for a company to acquire a new customer than it is to retain a current customer. This is why insurers craft loyalty programs to solidify long-term customer bonds and to procure customer satisfaction. An insurer may communicate with its customers through advertising, personal promotions, sales promotions, public relations, direct promotions, and enhancing the skills of its employees charged with customer contact.¹⁸ The skills that employees of insurance undertakings and other insurance intermediaries, such as agents and brokers, have are important. Likewise, providing information with integrity about the rights and duties of the parties to an insurance contract is of importance, as are the courtesy and respect paid to customers. The objective of a customer-focused strategy is to build long-term relationships with the most profitable customers and customer segments. An important channel of communication with customers involves using specialized intermediaries, such as insurance agents. An insurer's value is built in this manner on the basis of customer value growth.

Customer lifetime value (LTV) is a method of measurement or a measure according to which one may anticipate the actions and future results of customer groups based on their current and

14. Ibidem, 255.

15. T. Doligalski, "Wartość portfela klienta," in *Współczesne źródła wartości przedsiębiorstwa*, ed. B. Dobiegała-Korona and A. Herman, [Warszawa: Difin, 2007], 434.

16. The commissions that are charged by reinsurers and thus reduce revenues (net earned premium) affect the revenues forming the basis for the current and future valuation of customers. Conversely, reinsurance as a way of diversifying risk reduces the risk of generating a loss on a customer. Effective reinsurance programs contribute to the value of an insurance franchise.

17. M. Chmielowiec-Lewczuk, "Zarządzanie kosztami a zarządzanie wartością zakładu ubezpieczeń," in *Inwestycje finansowe i ubezpieczenia – tendencje światowe a polski rynek*, ed. K. Jajuga and W. Ronka Chmielowiec, [Wrocław: Wyd. Uniwersytetu Ekonomicznego we Wrocławiu, 2009], 55.

18. H. Mruk, "Sposoby skutecznego komunikowania się zakładu ubezpieczeń z rynkiem," *Zeszyty Naukowe, Uniwersytet Ekonomiczny w Poznaniu* 127 (2009): 668.

future purchasing behaviour. LTV is the product of a customer's average spend and the number of periods in which a given person continues to be a customer of the company.¹⁹

To compute an insurance undertaking's customer value, one may apply a simple method of measurement proposed by P. Doyle, who defines customer value during the period of service as the sum total of net discounted cash flow during the entire period of an insurance undertaking's relationship with a customer.²⁰ Both the period over which an insurer shares relations with a customer and the cost a firm must incur to acquire and retain a customer are important. Most of them present a sum total of discounted flow. Nonetheless, additional parameters are frequently added to define the type of cash flow with great precision. The formula used by Bauer and Hammerschmidt may be used by insurers as it illustrates the various types of figures that affect customer value.²¹

The value of a customer in an insurance institution may be computed using the formula below

$$CLV_i = -AC_i + \sum_t \left(r_{ti} \times \frac{(AR_{ti} + UR_{ti} + CR_{ti} + RV_{ti}) - (SC_{ti} + MC_{ti})}{(1+d)^t} - r_{ti}^{t-1} \times (1-r_{ti}) \times \frac{TC_i}{(1+d)^t} + r_{ti}^t \times \left\{ \frac{InfoV_{ti} + CoopV_{ti} + InnoV_{ti}}{(1+d)^t} \right\} \right)$$

where:

CLV – value of insurer's customer i (net current value of future earnings generated by that customer),
 AC – insurer's cost to acquire customer i , r – retention rate of customer i in period t , AR – basic revenue generated by customer i in period t , UR – up-selling revenue generated by customer i in period t , CR – insurer's cross-selling revenue generated by customer i in period t , RV – referral value produced by customer i in period t , MC – insurer's marketing costs to retain customer i in period t , SC – costs of sales of products and of service provided to customer i in period t , TC – costs of terminating an insurer's cooperation with customer i in period t , $InfoV$ – value of information an insurer receives from customer i in period t , $CoopV$ – value of an insurer's cooperation with customer i in period t , $InnoV$ – value of innovations proposed by customer i in period t , d – discount rate, T – number of periods considered (years).

The economic results and organisation of the insurance company will be reflected in:

- the value of the market segments in which the insurance company operates,
- the value of customers and the ability of the insurer to keep and increase this value,
- customer loyalty and acceptance for sale and cross-selling, which increases the competitiveness of each insurance company.

Insurance companies survey the market. To articulate their marketing strategies they monitor customer behaviour, they develop customer profiles and they properly diversify their insurance portfolio with regard for a number of criteria.²² One criterion for inclusion in various customer groups involves claims frequency and claims value versus the average. Customer data analysis, including historical behaviour, income levels, the number, value and frequency of transactions, and the costs of customer service all have a role to play in assessing total customer value. These data may be

19. A. M. Hughes, "How Lifetime Value is Used to Evaluate Customer Relationship Management," Database Marketing Institute, <http://www.dbmarketing.com/> as cited in J. Rodzinka, "Korzyści rynkowe ubezpieczycieli wynikające z posiadania grupy lojalnych klientów," *Zeszyty Naukowe, Uniwersytet Ekonomiczny w Poznaniu* 127 (2009): 137.

20. P. Doyle, *Value-Based Marketing* (John Wiley & Sons, Ltd., 2000) as cited in B. Dobiegała-Korona, "Istota i pomiar wartości klienta," ed. Dobiegała-Korona and Doligalski, "Zarządzanie wartością," 29.

21. H. H. Bauer, M. Hammerschmidt and M. Brauchler, "The Customer Lifetime Value Concept and Its Contribution to Corporate Valuation," in *Yearbook of Marketing and Consumer Research*, (2003). B. Dobiegała-Korona, "Istota i pomiar wartości klienta," ed. Dobiegała-Korona and Doligalski "Zarządzanie wartością," 36.

22. J. Jędrzejczyk, "Kształtowanie wartości," 263.

used to eliminate customers whose retention would outstrip the profits generated by an insurer and to create a database of highly profitable customers. Customer segmentation may be effected, for instance, by the costs of customer service, the margin earned on various customer groups and the added value of customers for an insurance undertaking.²³

Table 1. Customers Generating High and Low Costs of Administration

Customers Generating High Costs of Administration	Customers Generating Low Costs of Administration
Purchase customized products	Purchase standard products
Buy a limited number of products	Buy a large number of products
The timing of purchases is unpredictable	The timing of purchases is predictable
Largely unaware of their insurance needs	Highly aware of their insurance needs
Require extensive sales support (marketing resources, financial incentives)	No or limited pre-sales support
Extensive after-sales support (claims handling costs)	No after-sales support
Late payments occur	Remit premiums regularly and on a timely basis

Source: E. Nowak, "Zarządzanie rentownością klienta," in *Systemy zarządzania kosztami i wynikami, Prace Naukowe*, E. Nowak, 58 (Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 2009), 340.

When offering their services insurance undertakings should focus their efforts on creating value for individual customer groups while continuously analysing the feedback they generate to enhance the value the company derives from various customer groups. The interactions between an insurance undertaking and its customers are particularly valuable provided that they generate a profit for the insurer while producing customer satisfaction. Insurance franchises secure a competitive edge insofar as they are capable of delivering high quality service with integrity to their loyal customers and manage to build long-term positive relations with them. In turn, one may take the requisite efforts to reduce the costs of catering to groups of customers generating a high level of administrative costs. If they are unsuccessful, one can cease to cater to these customers.

4. The Significance of an Insurance Undertaking's Customer Loyalty

Insurers have been using an incentive system in the form of discounted premiums for continuing insurance, premium relief, price abatement, rebates and discounts, as well as reductions for customers purchasing bundled insurance, for instance comprehensive insurance for small and medium-sized enterprises.²⁴ By selling bundles of insurance products customers are able to optimize their premiums and spread their risk.²⁵

23. E. Nowak, "Zarządzanie rentownością klientów," in *Systemy zarządzania kosztami i wynikami, Prace Naukowe*, ed. E. Nowak, 58 (Wrocław: Wydawnictwo Uniwersytetu we Wrocławiu, 2009), 339.

24. Put differently, bonuses are premium discounts linked to a lower risk while loadings are surcharges increasing the premium to reflect above average risk.

25. Customers who buy comprehensive motor insurance including motor TPL, motor own damage and accidental insurance also receive a 24/7 assistance product. [proponuję zmianę na: "including motor TPL and cover against accidental or malicious damage also receive a 24/7 roadside assistance product"]

Loyalty programs in cooperation with specialized third parties such as banks, petrol stations, car dealers and travel agencies are being offered with increasing frequency. For instance, Link4 has several loyalty programs with Statoil (for Premium Club members), Ikea and Alior Bank.²⁶ Loyalty programs make it possible to better appreciate customer needs and income. Customers may receive more than discounts for their loyalty. For example, they may get vouchers or cash coupons for soliciting more customers for a given company. Individuals who join the Bonus Club in UNIQA receive cash coupons depending on the number of policies they have. One outcome of a loyal customer's cooperation with an insurer that poses difficulties in measurement consists of referrals of prospects.

Łukasz Skowron defines a loyal customer by citing Jill Griffin as a person who:²⁷

- 1) makes regular recurring purchases to a given company,
- 2) constantly uses the services [or products] offered by that company based on subjective feelings,
- 3) disseminates positive information about the company and recommends it to others,
- 4) is resistant to the competition's promotional activities.

For customers to be loyal to an insurance undertaking, its insurance service must accrue value to its customers stemming from the attributes of that product or a group of insurance products. For instance, this may be associated with a growing awareness of risk, with insurance coverage satisfying a specific customer need where customers accept the amount of the insurance premium in question. In addition to the service itself, customers value convenience and their own time. For this reason, insurance undertakings should employ a variety of convenient channels of distribution. The trust placed in a company's brand is also of importance to customers. A loyal customer is not always a satisfied customer. The specific nature of a product may compel customers to maintain long-term relations with their insurer. One example would be the buyers of unit-linked life insurance with respect to which lapses, especially in the first several years, entail bearing a high surrender fee.

According to Jacek Rodzinka, whose conclusions have been confirmed by empirical research, loyalty may also stem from the high costs of changing service providers. Customers may experience discomfort when mastering the rules of operation or other attributes of the competition's products. Customer loyalty may be achieved through an incentive system (discounts, presents, rebates).²⁸ In turn, maintaining long-term cooperation with customers cannot be solely predicated on permanent promotions. That is why it is indispensable to investigate the factors instilling feelings of loyalty among customers and to create databases entailing the attributes of various discrete customer segments, so as to develop new or modified products tailor-made to the changing needs in the life cycles of consumers of insurance services.

Some consumers of insurance services do not display an inclination to be loyal to their insurers. The major causes of this include their growing awareness of insurance, their ever greater requirements, their rejection of inadequate quality of service, the insufficiency of knowledge among insurance intermediaries, the length and burdensome nature of the claims handling process and the lack of any differentiating product attributes compared to less expensive products offered by the competition. Customers compare their expectations with the results and experiences they have

26. "Program lojalnościowy sposobem na zatrzymanie klienta," *Dziennik Ubezpieczeniowy* 2009/09/17.

27. Ł. Skowron, "Satysfakcja i lojalność klienta – modele i wyniki badań," ed. Dobiegała-Korona and Doligański "Zarządzanie wartością," 184.

28. J. Rodzinka, "Analiza cech determinujących lojalność klientów zakładów ubezpieczeń Działu II w województwie podkarpackim," *Wiadomości Ubezpieczeniowe* 4 (2010) 32.

during purchases and in the course of using an insurance service.²⁹ They may be disappointed by a promotion or the conditions of distribution, mistakes in the training of staff or insurance intermediaries offering insurance or a low standard of service offered by claims handlers or adjusters.

5. Customer Relationship Management

Consumers of insurance services, namely customers as policyholders or those insured, choose insurance products and insurers depending on their needs, preferences, customs and likes, among other factors. Numerous conditions affect customer decisions such as the marketing strategies pursued by insurance undertakings and banks that offer bancassurance. Insurers and banks make marketing, product and price-related decisions having in mind customer value. This signifies the need to conduct more precise research into the level of customer satisfaction and the benefits offered by the insurance acquired. The gross written premium collected by banks in Poland in selling insurance and bancassurance is growing from year to year. In conjunction with the expansion of the bancassurance market, the number of complaints filed by customers with the Insurance Ombudsman is on the rise. Most complaints pertain to mis-selling concerning policy conditions and solicitation errors, whereby consumer claims are denied and insurance fails to provide real coverage. Most conflicts pertain to mortgage insurance in the form of bridge insurance.

Conclusions

Managing customer value is becoming an important area of corporate activity, also for insurance undertakings operating on a competitive market. Growing customer value translates into growing an insurance undertaking's value for its owners and other stakeholders.

The value of an insurance company is affected by:

- customer value and customer loyalty, determined by their level of satisfaction and the skillful, effective management of maintaining relationships with them,
- position in the segments of the insurance market of increasing value. Value market segments are determined by the value of current and future customers, and consequently influence the future premiums and profits of the insurer.

The issue is whether by analysing customer satisfaction an insurance undertaking is able to conduct effective marketing efforts capable of turning a prospective buyer into a loyal long-term customer buying its products. "A financial firm cannot offer products to a customer if it does not have the information needed to estimate its suitability to a customer's needs."³⁰ Increasingly, more complicated hybrid bancassurance products are being offered to customers. For instance, structured products that are essentially not very transparent, and the possibility of generating profit is predicated on a mathematically complicated index, which is not readily comprehensible to customers.

29. Z. Wańkowski, "Problemy kształtowania lojalności nabywców," *Świat Marketingu*, Internet magazine, February [2002]. Ł. Świerżewski, "Edukacja jako wartość dla klienta," *Kwartalnik Nauk o Przedsiębiorstwie* 2 [2010] 77.

30. K. Jajuga, "Współczesny kryzys finansowy: źródła i skutki," *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Poznaniu* 127 [2009]: 748.

A customer-focused marketing strategy coupled with delivering value to customers is applicable not just to developing and selling products aligned to customer needs and expectations but also to the quality of service expected by customers.

References

- Adamska A. and Dąbrowski T., "Marketing i finanse w przedsiębiorstwie," Warszawa: Wyd. C.H. Beck, 2007.
- Bauer H.H., Hammerschmit M., and Brauchler M., "The Customer Lifetime Value Concept and Its Contribution to Corporate Valuation," *Yearbook of Marketing and Consumer Research* 1 (2003).
- Blattberg R.C., G. Getz, and J.S. Thomas, "Customer Equity. Building and Managing Relationship as Valuable Assets," [Harvard Business Review Press, 2001].
- Chmielowiec-Lewczuk M., "Zarządzanie kosztami a zarządzanie wartością zakładu ubezpieczeń," in *Inwestycje finansowe i ubezpieczenia – tendencje światowe a polski rynek*, edited by K. Jajuga, and W. Ronka Chmielowiec. Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 2009.
- Dobiegała-Korona B., "Wartość dla klientów generatorem wartości przedsiębiorstwa," in *Współczesne źródła wartości przedsiębiorstwa*, edited by B. Dobiegała-Korona, and A. Herman. Warszawa: Difin, 2006.
- Dobiegała-Korona B., "Wartość klienta," in *Metody wyceny spółki: perspektywa klienta i inwestora*, edited by M. Panfil and A. Szablewski, 81-97. Warszawa: Poltext, 2006.
- Dobiegała-Korona B., "Istota i pomiar wartości klienta," in *Zarządzanie wartością klienta. Pomiar i strategię* edited by B. Dobiegała-Korona, and T. Doligalski. Warszawa: Poltex, 2010.
- Doyle P., "Value-Based Marketing," John Wiley & Sons, Ltd. 2000.
- Gąsiorkiewicz L., "Finanse zakładów ubezpieczeń majątkowych, teoria i praktyka," Warszawa: C.H. Beck, 2009.
- Hughes A. M., "How Lifetime Value is Used to Evaluate Customer Relationship Management." Database Marketing Institute. <http://www.dbmarketing.com/>.
- Jajuga, K., "Współczesny kryzys finansowy," *Studia Ubezpieczeniowe, Zeszyty Naukowe* 127 (2009).
- Jędrzejczyk, I., "Kształtowanie wartości zakładu ubezpieczeń," in *Finansowe narzędzia zarządzania zakładem ubezpieczeń*, edited by T. Sangowski. Warszawa: Poltext, 2005.
- Kotler P., "Marketing Management: Analysis, Planning, Implementation, and Control," 7th Edition [Englewood Cliffs, NJ: Prentice-Hall Inc., 1991].
- Kotler P., "Marketing Management – Analysis, planning. Implementation, and Control," 7th edition. Englewood Cliffs. NJ.: Prentice-Hal Inc., 1991.
- Masiukiewicz P., and Wierzbička E., "Specifics of customer value models in financial institutions," in *Customer Value Creation, theory and practice*, edited by B. Dobiegała-Korona, and P. Masiukiewicz. Warszawa: Warsaw School of Economics Press, 2012.
- Mruk H., "Sposoby skutecznego komunikowania się zakładu ubezpieczeń z rynkiem." Ed. J. Hand-schke, *Studia Ubezpieczeniowe, Zeszyty Naukowe* 127 (2009).
- Nowak E., "Zarządzanie rentownością klienta," *Systemy zarządzania kosztami i wynikami, Prace Naukowe* 58 (2009).
- Polański Z., "Wprowadzenie, System finansowy we współczesnej gospodarce rynkowej," in vol. 1 of *System finansowy w Polsce*, edited by B. Pietrzak, Z. Polański, and B. Woźniak. Warszawa: PWN, 2008.

"Program lojalnościowy sposobem na zatrzymanie klienta," *Dziennik Ubezpieczeniowy*, September 17, 2009.

Rodzinka J., "Analiza cech determinujących lojalność klientów zakładów ubezpieczeń Działu II w województwie podkarpackim," *Wiadomości Ubezpieczeniowe* 4 (2010) 32.

Szablewski A., "Klient jako najważniejsze aktywwo przedsiębiorstwa," *CEO: Magazyn Top menedżerów*, accessed April 3, 2011 <http://eco.cxo.pl/artykuly/druk/52077/klient.jako.najwazniejsze.aktwywo.przedsiębiorstw>.

Szymura-Tyc M., "Zarządzanie przez wartość dla klienta – budowa wartości firmy," Instytut ZTI. Accessed March 10, 2013, http://www.zti.com.pl/instytut/pp/referaty/ref4_full.html.

Świerżewski Ł., "Edukacja jako wartość dla klienta," *Kwartalnik Nauk o Przedsiębiorstwie* 2 (2010).

The Insurance Activity Act of 22 May 2003, Journal of Laws, no. 134 item 1151 as amended.

Waśkowski Z., "Problemy kształtowania lojalności nabywców," *Świat Marketingu* 2 (2002).

Wierzbicka E., "Ubezpieczyciel wobec przemian rynku usług finansowych" in *Ubezpieczenia gospodarcze wobec wyzwań globalizacji rynków finansowych*, edited by T. Michalski. Warszawa: Oficyna Wydawnicza SGH, 2007.

Znaczenia wartości klienta dla zakładu ubezpieczeń

Celem niniejszego artykułu jest pokazanie znaczenia wpływu wartości klienta na wartości ubezpieczyciela (zakładu ubezpieczeń). Klienci generują przepływy pieniężne i w dużej mierze determinują rentowność zakładu ubezpieczeń. W związku z tym niezbędna jest identyfikacja i kwantyfikacja potrzeb klientów zakładu ubezpieczeń oraz poziomu zadowolenia z jakości produktów i usług. Wartość klienta dla ubezpieczyciela należy mierzyć i maksymalizować, na przykład poprzez dostosowywanie produktów do zmieniających się potrzeb w cyklu życia klienta. Lojalny i zadowolony klient tworzy wartość dla ubezpieczeń.

Słowa kluczowe: wartość klienta, ubezpieczyciel, lojalność, zarządzanie relacjami z klientem, wartość życiowa klienta.

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MARZANNA LAMENT

Audit as a control mechanism used by insurance companies

Auditing is used by insurance companies in the form of external audits, internal audits, and audit committees. Their principal objectives are more efficient risk management processes and adequate generation of finance and accounting information. The significance of these control mechanisms will be enhanced by the introduction of Solvency II, though their operation is also provided for by balance sheet laws. Research indicates that insurance companies have integrated these mechanisms as part of their structures, yet the rules governing them need to be streamlined, as suggested not only by the regulations of the Solvency II directive, but also insurance companies themselves.

In view of the similarity between the objectives and scopes of audits carried out by insurers, it is reasonable to strive toward assuring principles of mutual cooperation in order to increase their effectiveness and improve the implementation of audit objectives.

This paper discusses the operation of audits in the practice of insurance companies, namely as internal audits and audit committees, as well as the principles of cooperation between internal audits and external audits in light of empirical research.

Key words: insurance, accounting in insurance companies, internal audit, external audit, audit committee.

Introduction

The key reason for applying control mechanisms is the presence of diverse irregularities – intended ones, defined as financial (book-keeping) frauds, or unintended errors, which are part of the operational risks experienced by every business. Thus, they comprise all kinds of irregularities caused by processes, humans, systems or accidents. Research shows that they are a major problem for all businesses. Therefore, appropriate control mechanisms may be a key step toward the improvement of the management system and a factor contributing to improved effectiveness of business undertakings.

The application of appropriate control mechanisms, including internal controls, internal audits and risk management, is not only a duty arising from regulations and good practices, but also

a means of protecting shareholder interests against any abuses or improper disclosure of information presented in accounts. They are a part of corporate governance.

The functioning of adequate corporate governance, which is defined as a system according to which an enterprise is run and managed,¹ contributes to enhanced competitiveness, since a well-managed enterprise guided by the principles of sustainable development is better prepared to pursue a specific strategy and builds public confidence in the marketplace. Corporate governance is a method of restricting adverse practices, namely the adoption of short-term views and the acceptance of excessive risk².

Thus, adequate corporate governance,³ inclusive of control mechanisms, is expected to provide for effective management and actions, chiefly in finance and accounting. Auditing is one of such mechanisms, applied as external audits, internal audits and audit committees.⁴

This paper is intended to discuss the reasoning behind auditing as a control mechanism in insurance companies and the various forms of audits, as well as to assess the principles of their operation in the practice of insurers.

Research conducted by the Polish Insurance Association, Polish Financial Supervision Authority, Polish Institute of Directors, Deloitte, and Ernst& Young has been used in this paper.

Descriptive and comparative analyses have been applied.

1. Scope and causes of applying control mechanisms

Article 41 of the *Solvency II* Directive stipulates that insurance and reinsurance companies are required to implement management systems that will assure correct and prudent management of the business in consideration of its nature, scale and complexity. This implies the need to introduce control mechanisms to provide for sufficient information flow and regularity of continuing business.

Insurance and reinsurance companies are required to maintain written rules of risk management, internal controls, internal audits and outsourcing, to be reviewed annually, mainly in the framework of new risks identified by insurers that may affect their adequate financial standing.⁵

1. The Committee on the Financial Aspects of Corporate Governance, "The Financial Aspects of Corporate Governance," The Cadbury Report. London: Gee, 1992, 15.
2. Directorate for Financial and Enterprise Affairs, OECD Steering Group on Corporate Governance, "Corporate Governance and the Financial Crisis. Conclusions and emerging good practices to enhance implementation of the Principles," OECD paper, 2010.
3. For more information about corporate governance, see the European Commission, "The UE corporate governance framework," Green Paper presented in Brussels, Belgium, on April 5, 2011; and European Commission, "Corporate governance in financial institutions and remuneration policies," Green Paper presented in Brussels, Belgium, on June 2, 2010.
4. For more information about audit, see: W. Gabrusewicz, ed., "Audyt sprawozdań finansowych," Warszawa: PWE, 2010; M. Kutera, "Rola audytu finansowego w wykrywaniu przestępstw gospodarczych," Warszawa: Difin, 2008; K. Winiarska, Audyt finansowy. Warszawa: PWE, 2009; B. Micherda, ed., "Kierunki ewolucji sprawozdawczości i rewizji finansowej," Warszawa: Difin, 2012; Mikołajczyk B. and M. Krawczyk, "Audyt wewnętrzny w teorii i praktyce ubezpieczeniowej," Warszawa: PWE, 2010.
5. Article 41 of Directive 2009/138/EC of The European Parliament and of The Council of 25 November 2009 (*Solvency II*), *Official Journal of the European Union*, L 335, 17/12/2009, and Directive COD 2011/0006 of The European Parliament and of The Council (*Omnibus II*) changing Directive 2003/71/EC and 2009/138/EC.

Control mechanisms imposed on insurance companies in line with the *Solvency II* Directive:

- requirements relating to competences and reputations of individuals who actually manage an insurer or occupy other key positions – Article 42,
- risk management – Articles 44 and 45,
- internal control – Article 46,
- internal audit – Article 47.

According to Article 41 of the *Solvency II* Directive, the selection of control mechanisms should comply with the following principles:

- the system should have an appropriately transparent structure including clearly assigned and divided tasks that provides for the appropriate flow of information,
- they should be subject to regular internal reviews every year as a minimum,
- they should be approved by an administrative, management or supervisory authority,
- a control system should be verified by a supervisory authority with regard to risks identified by the insurer that may affect adequate financial standing,
- a supervisory authority should have the right to require improvement and strengthening of the management system,
- they should be adapted to the nature, scale and complexity of an insurer,
- they should reflect any changes in the insurer's operations,
- the control mechanisms applied should contribute to continuity and regularity of the insurer's operations,
- rules of risk management, internal audit, internal control and outsourcing should be executed in writing.

The implementation of the *Solvency II* Directive will oblige insurance companies to run effective management systems that will execute a substantial amount of their tasks via appropriate control mechanisms, both qualitative, as part of the corporate culture, and those based on corporate control mechanisms.

The system should be adapted to the needs, scale and complexity of an insurer's operations and should as a minimum comprise risk management, internal controls and internal auditing. Adjustment to needs, scale and complexity means that an insurer may outsource certain mechanisms, keeping in line with specific principles.

Such a management system including a full range of control mechanisms will undoubtedly improve information flow and thereby help to detect any irregularities faster, thus giving rise to a better system of diagnosing the financial standing of insurance companies.

Of course, having a variety of control mechanisms is not a guarantee of their effectiveness. A lot depends on proper selection, the instruments applied, and their assignment to particular areas of an insurance company's business. It must be noted, though, that it is true that the more control mechanisms are utilised, the more easily irregularities will be detected⁶.

The control mechanisms introduced will enhance the quality of insurance businesses. This will result from on-going reviews, verification, evaluation and the adjustment of old principles and solutions to meet new needs and conditions. This is the only effective way of exploring new risk types and their effective management, or at least one that will not jeopardise an insurer as a going concern.

6. For more information about control mechanism and economic crime, see: PriceWaterhouseCoopers et al., "Economic crime: people, culture and controls. The 4th biennial Global Economic Crime Survey," London: PriceWaterhouseCoopers, 2008.

Unfortunately, the research demonstrates that these mechanisms are not well-known or understood. Costs and the absence of data to support their profitability are common barriers to their implementation, with the new legislation imposing the duty of introduction as the only incentive. Therefore, the solutions proposed by the *Solvency II* Directive must be appreciated in relation to businesses such as insurers where reliable and real service is required, since each instance of insolvency can undermine confidence in the entire insurance market for years to come.

It is worth noting that Article 2, part 4d and Article 86 of the Act on Expert Auditors and Their Self-Government, Entities Authorised to Examine Accounts, and Public Supervision of 7 May 2009 [“Act on Auditors and their Self-Regulatory Bodies”, Journal of Laws No. 77, item 649, as amended] treat insurers as public interest organisations, subject to financial auditing that is compulsorily strengthened by the duty to establish audit commissions and introduce public supervision in order to provide for high professional standards of auditors and auditing companies, and thus to streamline supervision of financial reporting processes and ensure reliable internal control and risk management.

2. Public supervision of insurance companies – audit committee

Public supervision is carried out by audit committees appointed by supervisory boards or boards of auditors from among their members,⁷ which companies were required to establish by 6 December, 2009, i.e. within six months of the effective date of the amended Expert Auditors Act.

Article 86 (2) of the Act contains a list of entities that are exempt from the obligation to establish an audit committee. These are:

- pension funds, investment funds,
- branches of credit institutions and branches of foreign banks,
- the main branches of insurance companies,
- co-operative banks,
- public interest entities, in which a supervisory board or an audit committee has not been established,
- co-operative savings and credit societies.

Audit committees must have a minimum of three members, including at least one independent member with accounting or financial auditing qualifications.⁸

Independence requirements are detailed in Article 86 (5) of the Act, which lists cases disqualifying one as being considered independent, including:

- holding of shares or other titles in the organisation or its associated organisation,
- involvement in the drafting of the organization’s books or accounts within the past 3 years,
- marriage, relation or first or second-degree direct affinity, or relations of care, adoption or guardianship with a member of management or of the organisation’s supervisory or administrative bodies.

In mutual insurance societies, the independence condition is also regarded as fulfilled when a committee member holds shares or other titles in the organisation or its associated entity due to the unique nature of mutual assurance societies.

7. Article 48 of the Act on Auditors and their Self-Regulatory Bodies of 7 May 2009 [Journal of Laws of 2009, No. 77, item 649].

8. Ibidem, article 86.

The requirements of accounting and financial auditing are not defined by statutes, and the relevant decisions are left to authorities appointing audit commission members. They are, thereby, not only capable of selecting appropriately qualified individuals, but also of considering experience corresponding to the profile of a given organisation.

Notably, in public interest organisations with supervisory boards of up to five members that fulfil the functions of an audit committee, the requirements concerning independence and accounting or financial auditing qualifications are not enforced, though failure to meet these requirements is treated by the Polish Financial Supervision Authority as a major risk factor to be included in share issue prospectuses and information memoranda.⁹

The operation of audit committees in Poland, and in particular, their goals, have been presented on the basis of the research conducted by Deloitte in association with the Polish Institute of Directors Foundation under sponsorship of the Polish Financial Supervision Authority.¹⁰

Twenty eight per cent of the organisations examined were active in the sector of financial services, which includes insurance companies.

Applicable legislation states that goals of audit committees may be carried out by:

- audit commissions consisting of a minimum of 3 members, including at least 1 member meeting the conditions of independence with accounting or financial auditing qualifications,¹¹
- supervisory boards comprising not more than 5 members.¹²

Thus, the composition of a supervisory board determines the means in which public supervision objectives should be carried out.

Research by Deloitte shows that in 57 per cent of the organisations examined, supervisory boards consisted of more than 6 members [6–7 members in 42 per cent organisations, 8–10 members in 10 per cent of organisations, 11 and more members in 5 per cent of the entities examined], which means that audit commissions should function in these organisations.

Five-member supervisory boards operated in 33 per cent of organisations and 3–4-member boards in 5 per cent of entities, which signifies that public supervision objectives could, but did not have to be undertaken by supervisory boards of 38 per cent of these entities. Research shows audit committees were established in 66 per cent of the organisations queried, which indicates they have been created in some organisations where it was not necessary, pointing to increased awareness and perception of absence of a committee as a risk factor to business operations.

The objectives as part of public supervision, implemented by either audit committees or by supervisory boards, are tabulated below.

In summary, the tasks of audit committees relate to the process of risk management – its identification and restriction in the areas of financial reporting and auditing, as provided for by legislation defining the roles to be fulfilled by audit commissions. The analysis shows, however, that only some audit commissions take a complex approach to the risk management process, i.e.,

9. Urząd Komisji Nadzoru Finansowego [Polish Financial Supervision Authority], "Rekomendacje dotyczące funkcjonowania komitetu audytu," Warszawa: Urząd Komisji Nadzoru Finansowego, 2010, 6.

10. Deloitte and Urząd Komisji Nadzoru Finansowego, "Raport: Współczesna rada nadzorcza 2012. Praktyka ładu korporacyjnego w Polsce," Warszawa: Polski Instytut Dyrektorów, 2012.

11. Article 86 of the Act on Auditors and their Self-Regulatory Bodies of 7 May 2009 [Journal of Laws of 2009, No. 77, item 649].

12. Ibidem.

cyclical and considering key risks associated with business operations (36 per cent). Most entities under consideration take incidental (54 per cent) or no (9 per cent) interest in risk. Worryingly, most audit committees do not perceive the risk of abuses as their major task – only 24 per cent of the entities reviewed undertake regular analyses of business operations with regard to this risk.

Table 1. Objectives as part of public supervision (% of entities examined)

Type of objective	All-round approach	Partial realisation	No realisation
Analysis of business and operational risk, rules of risk management	36	54	9
Assessment of effectiveness of internal control system (independent from management board)	2	71	27
Work with management board in the assessment process of internal control and risk management system	19	21	60
Prevention of abuse (risk management)	24	59	17
Assessment of entity's social responsibility regarding quality of the communication process and investor relations reporting	26	42	30
Assessment of internal auditor's performance	22	36	42
Meetings with internal audit director	34	30	36
Meetings with external audit (external auditor takes part in meetings of supervisory board or audit committee)	5	71	24
Supervisory board or audit commission meets the external auditor of the accounts	43	33	24
Assessment of cooperation quality between external audit and management board	38	–	62
Impact of supervisory board on responsibilities of internal audit function (planning of audit objectives)	15	28	57
Supervisory board or audit commission are informed about results of the internal auditor's efforts	22	36	42

Source: the author's own compilation on the basis of a report by Deloitte and Polish Financial Supervision Authority "Współczesna rada nadzorcza 2012. Praktyka ładu korporacyjnego w Polsce."

Collaboration of audit committees with internal and external auditors and other company authorities is successful, though in most cases it does not represent an all-around approach to the issue under analysis, thus it cannot be treated as programmatic or systematic.

In time, the flaws will be eliminated, which will contribute to a fuller implementation of objectives envisaged for audit committees. This still requires increased awareness of risk and the role of audit committees as mechanisms of public supervision, although businesses are obliged to set them up and supply them with relevant instruments and mechanisms of control. Their development will only be possible, though, once the absence of an audit committee is seen as a major risk factor interfering with business growth.

The figures tabulated below are proof of the continually scant application of tools essentially providing for the effectiveness of audit committees.

The analysis of these results shows that the bulk of entities do not take advantage of these instruments, largely for the reasons discussed before – audit committees are not seen as tools supporting the risk management process or as effective mechanisms of public supervision.

Surprisingly, such globally common mechanisms as codes of ethics, whistleblowing and compliance are employed by fewer than a half of the businesses examined: whistleblowing – by 29 per cent, compliance – by 44 per cent, codes of ethics – by 53 per cent.

It should be stressed, however, that as audit committees develop, control tools will increase in numbers and new ones will emerge, while some others will cease to be applied since the changing business environment will give rise to new risks, as well as new methods and instruments to evaluate and monitor them.

Table 2. Instruments exercised by audit committees [% of entities examined]

Control instrument	Complex approach	Partial realisation	No usage
<i>Whistleblowing</i> – procedure of anonymous notification of abuses to management or the supervisory board	29	11	60
Codes of ethics	53	–	47
Analysis of transactions between company and management board members and of transactions with associated entities, other than typical (operational) transactions	69	14	17
Analysis of links between commercial partners of a company and management board members or staff with regard to conflicts of interest	38	36	26
Compliance function of an entity	44	–	56
Analysis of corruption and abuse risks	29	26	45

Source: the author's own compilation on the basis of a report by Deloitte and Polish Financial Supervision Authority "Współczesna rada nadzorcza 2012. Praktyka ładu korporacyjnego w Polsce."

3. Internal audit in practice of insurance companies

The importance of internal audits for insurance companies is set to increase as the system of solvency assessment in compliance with assumptions of *Solvency II* is implemented. Pillar II will focus on the particular significance of control mechanisms, including internal audits, on the relationship between the internal auditing function and the effectiveness of insurance company management.

Ernst&Young evaluated the role of internal audits in insurance companies in a 2011 study, part of which analysed UK and Western European insurers in the following respects:

- scope of internal auditing,
- qualifications of internal auditors,
- audit planning,
- methodology of internal audits,
- impact of *Solvency II* on internal audits,
- challenges to internal audits.¹³

13. Ernst & Young, "Insurance internal audit survey. Current challenges and emerging trends," a report by Ernst & Young, September 2011.

The principal role of the internal auditing is to support business operations by evaluating processes of risk management and internal control. The research demonstrated that the expectations of internal auditing chiefly involve:

- risk management,
- responding to changing business factors,
- assessment of management systems and prevailing practices.

Insurers pointed to the following key areas to be monitored by internal audits:

- business goals – support for their implementation,
- business productivity,
- staff qualifications and skills – better utilisation,
- consultancy on programmes implementing changes,
- indication of change areas,
- reducing the risk of fraud,
- consultancy on launching new products and entering new markets,
- comparison with other insurers or other similar businesses,
- continuation of business monitoring.

When asked about the expected time frame over which internal audits should improve business functions, 50 per cent of the queried insurers selected the forthcoming 12 months, 25 per cent – within 1–2 years (between 12 and 24 months), while 25 per cent perceived no such need.

These results can be interpreted as follows:

- insurance companies see no reasons for change since, in their beliefs, internal audits properly fulfil their purposes, and their scope covers all key areas,
- insurance companies perceive limitations on the verification of internal audit schedules in place, therefore 50 per cent of surveyed insurers see no potential for changing internal audits within 12 months. These are limitations arising from the planning process of internal audits.

Actuarial, risk and finance management skills are internal auditor qualifications most commonly highlighted by insurance companies. Actuarial knowledge deserves particular attention as it is unique to insurers, and without it the examination of any insurance business is basically futile and incapable of generating any reliable knowledge of an insurer's current position.

In the short term, internal auditing in insurance companies should comprise the following areas:

- *Solvency II* – contribution to the sustainable development of processes to be carried out, as well as monitoring of the extent and manner of their implementation,
- changes – monitoring implemented projects and business programmes, with more focus on the actual effects of changes rather than conforming project assumptions to reflect the implementation of these changes,
- risk management – concentration on effective management, as well as the development of new risk management rules and practices.

Solvency II and the management of change processes were the key areas to be included in audit schedules as indicated by insurers – 78 per cent each.

The methodology of an audit is based on the specific characteristics of the on-going changes – 58 per cent of the analysed insurance companies had varied their strategies of internal audits in the previous three years. The most common changes included:

- staffing changes,

- the need to adapt internal auditing to the objective and strategy of the insurance company [this cause seems to be a result of the implementation of *Solvency II*],
- software changes.

When asked to assess the extent of changes made to their internal auditing methodology, 41 per cent of insurers said they were moderate, with only 17 per cent not having undertaken any changes at all.

The major challenges to internal auditing include continuing improvement of risk management processes and standardisation of control. This was corroborated by the results – 84 per cent of examined insurance companies found that risk management and compliance should improve in the future, chiefly thanks to *Solvency II*.

The function of internal auditing in insurance companies is tabulated below.

Table 3. Principles of internal audit operation in insurance companies

Area of evaluation	% of insurers queried
Key qualifications of internal auditors in insurance companies:	
• Actuarial	83
• risk management	33
• IT, finance	25
Cooperation of internal audit with the environment of insurance company:	Mark ¹⁴ :
• external audit	3.00
• professional institutions	2.92
• public information	2.58
• other audit companies	2.50
• other	1.58
Areas most commonly included in internal audit scheduled of insurers:	
• <i>Solvency II</i>	78
• management of changes processes	78
• risk	44
• finance	33
• assessment of insurance risk	33
• other	44
Scope of changes to internal audit methodology:	
• significant	17
• moderate	41
• minor	25
• no change	17
Assessment of risk management processes and compliance in insurance companies:	
• optimized	0
• advanced	8
• established	84
• evolving	8
• basic	0
Areas of <i>Solvency II</i> included in annual internal audit schedules (pillar I):	
• standard models	100
• internal models	83
• independent model validation	58
• quantitative indicators	92

14. The highest mark is 3.50 – it represents very effective cooperation; the lowest mark is 0.50 – it represents an absence of effective cooperation.

Areas of <i>Solvency II</i> included in annual internal audit schedules (pillar II):	
• management	100
• effectiveness of risk management	92
• ORSA (Own Risk&Assessment)	92
Areas of <i>Solvency II</i> included in annual internal audit schedules (pillar III):	
• external monitoring	75
• publication readiness	67
• compliance with internal solutions and financial reporting	67

Source: the author's own compilation on the basis of a report by Ernst & Young, "Insurance internal audit survey. Current challenges and emerging trends".

It can be concluded that the area of internal auditing for insurance companies will continue to develop, largely due to the implementation of *Solvency II* and to the very nature of internal auditing, which by definition must consistently undergo changes to be capable of effectively supporting risk management. This will be reflected in modifications to current audit methodologies and in the development of the actuarial function, which is unique to insurance companies.

4. Cooperation between internal audit and external audits

Internal and external audits are control mechanisms tasked with the evaluation of certain processes of an insurance company in order to eliminate potential errors and threats. It must be emphasised, though, that the scopes of internal and external audits are essentially different:

- internal audits cover the entire business of an insurer, thus they are able to identify and assess any risks to operations,
- external audits involve, in particular, the verification of accounts and their compliance with applied accounting principles (policies), together with the reliability and clarity of the standing and financial performance of the entity under examination.¹⁵

Thus, the scope of internal audits is significantly broader than that of external audits. It cannot be said, however, that the scope of external audits is within the scope of internal audits – in theory, accounting and finance issues, as well as financial audits are parts of internal audits, however in this case they are usually not subject to, for example, a thorough annual review since they are treated as lower-risk and can be excluded from internal audit schedules as a result. Therefore, the role of external auditing does not diminish when internal audit is introduced. Verification of an insurer's accounts and accounting policies is the sole responsibility of expert auditors, that is, external audits.

Mutual cooperation between both types of auditing is highly recommended, not only because the scopes of both overlap, but also due to the fact that it can be of advantage to both internal auditors and expert auditors.

Collaboration between internal and external audits is rooted in standards governing both control mechanisms.

15. B. Mikołajczyk, M. Krawczyk, "Audyt wewnętrzny w teorii i praktyce ubezpieczeniowej," Warszawa: PWE, 2010, 27; T. Kiziukiewicz, ed., "Audyt wewnętrzny w jednostkach sektora finansów publicznych," Warszawa: Difin, 2007, 14–15; W. Gabrusewicz, ed., "Audyt sprawozdań finansowych," Warszawa: PWE, 2010, 14–16.

In line with the National Standard of Financial Auditing, No. 1, *General Principles of Accounts Auditing*, an expert auditor examining accounts can take advantage of the findings of an internal audit and internal control with regard to the reliability and conformity of information contained in accounts with applicable accounting principles (policies), provided they have previously verified that these findings could be relied on. The need to verify the reliability of an internal audit methodology is an added incentive to develop principles of cooperation between internal and external audits, as it would facilitate the preparation of some joint solutions. The compulsory change of expert auditors and the consequent need to re-establish rules of cooperation appears to pose some problems. The problem is only theoretical, though, and should be treated as an additional control mechanism helping to verify the existing cooperation and eliminate potential risks, e.g. flawed or missing procedures.

According to *International Standards for Professional Practice of Internal Auditing*, an internal audit is intended to coordinate the actions of both external and internal providers of assurance and consultancy services in order to ensure an appropriate scope of auditing and to avoid duplication of activities. Therefore, actions carried out by external auditing should be considered when planning tasks of internal auditing, in particular:

- scope of accounts audited,
- risk assessment,
- techniques and methods of examination.

These considerations imply that the standards concerning both internal and external auditing envisage mutual collaboration of these control mechanisms. The following elements are required to this end:

- an appropriate way of communication, involving the transfer of certain information and regular meetings,
- evaluation of generated information, involving the access to auditor programmes, working materials and notes,
- application of similar work techniques and methods,
- assessment of the effectiveness of cooperation between internal auditing and expert auditors by an internal audit administrator.

It should be mentioned that the management or supervisory board is the authority assuring cooperation between internal and external auditing, as well as monitoring the effectiveness of their cooperation. In line with the recommendations of the Polish Financial Supervision Authority,¹⁶ audit commissions should act as coordinators of collaboration between expert auditors and internal auditors. However, these coordination efforts should include in particular:¹⁷

- joint discussions about draft annual schedules of internal auditing and the scope of accounts examination, including risk methodology and perception to apply,
- assessment of coordination of the cooperation between internal auditing and expert auditors, including determination of whether efforts by internal auditing and expert auditors are being doubled and, possibly, the determination of reasons for such duplication,
- verification of accounts prior to their approval, a discussion with internal auditing and expert auditors of the possible weaknesses in the internal control system identified as part of auditing,

16. Urząd Komisji Nadzoru Finansowego, "Rekomendacje dotyczące funkcjonowania komitetu audytu," Warszawa: Urząd Komisji Nadzoru Finansowego, 2010.

17. Polska Izba Ubezpieczeń [Polish Insurance Association], "Dobre praktyki w zakresie współpracy między audytem wewnętrznym a biegłym rewidentem w zakładach ubezpieczeń," Warszawa: Polska Izba Ubezpieczeń, 2011, 16.

- joint consideration of monitoring results of an insurer's implementation of recommendations issued as part of account auditing,
- taking advantage of the results arrived at by internal auditing and expert auditors for the purposes of an annual assessment of the internal control and risk management systems,
- taking advantage of internal audit analysis as part of forming opinions about expert auditor's independence.

The cooperation of internal and external auditing is also based on the *Solvency II* Directive, according to which internal audit is a key function in the management system, in parallel with risk management, actuarial, and regulatory compliance functions.

For the internal audit function to be carried out, it should add value and improve organisation, which in turn requires a disciplined approach to assessment, and improved effectiveness of risk management, control and insurer management processes. Therefore, the management of an insurance company should employ a variety of sources in its assessment of risk management effectiveness.

Collaboration of internal and external auditing may undoubtedly contribute added value to an insurance company and thus bring a number of benefits to both sides, including¹⁸:

- more effective auditing (both internal and external),
- less effort on the implementation of audit tasks,
- better and more complete risk identification,
- better planning of an auditor's work,
- better understanding of the results that can affect future internal and external auditing actions,
- sharing knowledge and experience,
- cost reductions.

The cooperation of internal and external auditing is indubitably an element contributing to the improved effectiveness of internal and external audits, it helps to prevent doubling of certain actions as part of audit efforts and enhances the reliability of an insurance company – obviously, everything depends on the model of mutual collaboration used.

The state of cooperation between internal and external auditing has been appraised on the basis of surveys conducted by the Polish Insurance Association in 2011.

It was undertaken in respect of the following areas:

- form of communication, where the ways and frequency of communicating are evaluated,
- planning of internal audits, where consulting of internal audit schedules with expert auditors – scope and areas of the consultation – are assessed,
- utilisation of internal audit analyses (testing) by expert auditors – an area appraising reliability and effectiveness of internal auditing to a substantial extent. Based on internal audit tests denotes high appreciation by the expert auditor and a possibility of predicting results and analyses, whereas the failure of the internal auditor to take advantage of the analyses is proof of the expert auditor's low opinion about the internal auditor efforts, respectively,
- transfer of expert auditor's knowledge to internal audit, where the utilisation of internal auditing results by expert auditors and vice versa is analysed,
- assessment of quality of cooperation between expert auditors and internal auditing.

The results concerning cooperation between internal and external audit are tabulated below.

18. Polska Izba Ubezpieczeń, "Dobre praktyki w zakresie współpracy między audytem wewnętrznym a biegłym rewidentem w zakładach ubezpieczeń," Warszawa: Polska Izba Ubezpieczeń, 2011, 18.

Table 4. Cooperation of internal and external audits in insurance companies

Area of cooperation	% insurance companies examined
Form of communication between internal audit and expert auditor: <ul style="list-style-type: none"> supply of internal audit documentation at the time of an expert auditor's visit 2–5 meetings a year – supply of internal audit documentation on-going supply of materials during the year tripartite meetings – internal auditor, expert auditor and audit commission 	21 64 28 14
Planning of internal audits: <ul style="list-style-type: none"> development of internal audit schedules by expert auditors consultation about scheduled audits at meetings between the expert and internal auditors expert auditor reports observations on areas subject to audit schedule expert auditor presents their own evaluation of major risks 	0 14 14 14
Utilisation of tests by internal auditor: <ul style="list-style-type: none"> expert auditor does not rely on testing carried out in the internal audit no information on expert auditor's reliance on testing by internal audit 	35 35
Transfer of expert auditor's knowledge to internal audit: <ul style="list-style-type: none"> expert auditors fail to share their knowledge or experience about the internal audit methodology 	100
Assessment of cooperation between expert auditor and internal audit: <ul style="list-style-type: none"> internal audit has no opinion on cooperation with expert auditor cooperation between expert auditor and internal audit must be more efficient opinion on cooperation of expert auditor and internal audit is submitted to management board opinion on cooperation of expert auditor and internal audit is submitted to audit commission 	64 57 21 28

Source: author's compilation on the basis of: Polska Izba Ubezpieczeń, *Dobre praktyki w zakresie współpracy między audytem wewnętrznym a biegłym rewidentem w zakładach ubezpieczeń*, [Warszawa: Polska Izba Ubezpieczeń, 2011], 10 et. seq.

The research demonstrates that the scope and the principles of cooperation between internal and external audits in insurance companies need to be more efficient, as indicated by 57 per cent of the insurers examined. It applies to virtually every area of cooperation. The key reservations concern:

- communication – expert auditors take advantage of the internal audit documentation at the time of accounts auditing in only 21 per cent of entities queried, whereas tripartite meetings of internal auditor, expert auditor and audit commission are held only in 14 per cent of the organisations;
- schedule of internal auditing – consultation of audit schedules with expert auditors and expert auditor's observations on areas subject to audit schedule are arranged by merely 14 per cent of the insurers tested;
- utilisation of tests by the internal auditor – in principle, expert auditors do not rely on testing by internal audits in 70 per cent entities;
- transfer of the expert auditor's knowledge to the internal audit: One hundred per cent of the insurance companies analysed pointed to the absence of this transfer.

It can be concluded that the principles and the scope of cooperation between internal and external audits require the development of certain good practices, bound to emerge in time – internal auditing is a relatively recent control mechanism in insurance entities and both its work methodologies, significance and status are still evolving. It should be stressed that the objectives of internal auditing differ from those of external auditing, defined as financial auditing. Beyond any doubt, such cooperation is useful in the perspective of both internal and external auditing since it may facilitate auditing goals and contribute to the increased effectiveness of the control mechanisms in question.

Conclusions

Auditing is undoubtedly a very important control mechanism for insurance companies as it supports management processes, in particular, in the areas of finance, accounting and risk management.

Applicable legislation binds insurers not only to have their accounting policies and accounts verified by expert auditors (external – financial auditing), but also to implement internal auditing and audit committees, the elements of public supervision.

The introduction of these control mechanisms in pursuit of similar objectives – supporting risk management processes in insurance companies – enforces the development of principles and areas of cooperation in order to enhance their effectiveness, reduce labour expenditures on auditing efforts, and improve the management of risk associated with the operations of insurance companies.

The research indicates that insurers have pointed to such areas and overall principles of collaboration, yet this is a process to be detailed and modified many times in the future. This applies in particular to the cooperation between internal and external auditing, but also between internal audits and audit committees – more than 50 per cent of the insurance companies queried perceive the need for such improvements and for more detailed rules of collaboration, chiefly in the field of mutual communication and sharing of experience, as well as audit scheduling.

The implementation of *Solvency II* will become a major driver of changes in audit operations by insurers and particularly their scope, a key object of analysis by internal audit, audit committee, and external audit. In time, forms of cooperation between these control mechanisms and the range of control tools will expand. It is difficult to precisely envisage the directions of these changes, as they will depend on shifting realities and new types of risk threatening the operations of insurance businesses. This is coherent with the idea and purpose of internal auditing, which must be subject to an on-going process of change in order to effectively support the risk management process in an insurance company.

References

- Directorate for Financial and Enterprise Affairs, OECD Steering Group on Corporate Governance, “Corporate Governance and the Financial Crisis. Conclusions and emerging good practices to enhance implementation of the Principles,” [OECD paper presented in Brussels, Belgium, in February 2010].
- European Commission, “Corporate governance in financial institutions and remuneration policies, Brussels,” [Green Paper presented in Brussels, Belgium, on June 2, 2010].
- Polska Izba Ubezpieczeń, “Dobre praktyki w zakresie współpracy między audytem wewnętrznym a biegłym rewidentem w zakładach ubezpieczeń,” [Warszawa: Polska Izba Ubezpieczeń, 2011].
- Directive COD 2011/0006 of the European Parliament and of The Council [Omnibus II] changing Directives 2003/71/EC and 2009/138/EC.
- Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 [Solvency II]. OJ L 335, 17/12/2009.
- PriceWaterhouseCoopers et al. “Economic crime: people, culture and controls. The 4th biennial Global Economic Crime Survey,” [London: PriceWaterhouseCoopers, 2008].
- Gabrusewicz W., ed., “Audyty sprawozdań finansowych,” [Warszawa: PWE, 2010].

- European Commission, "The UE corporate governance framework," [Green Paper presented in Brussels, Belgium, on April 5, 2011].
- Ernst & Young, "Insurance internal audit survey. Current challenges and emerging trends," [Report by Ernst & Young, September 2011].
- Kiziukiewicz T., ed., "Audyt wewnętrzny w jednostkach sektora finansów publicznych," [Warszawa: Difin, 2007].
- M. Kutera, "Rola audytu finansowego w wykrywaniu przestępstw gospodarczych," [Warszawa: Difin, 2008].
- Act on Auditors and their Self-Regulatory Bodies of 7 May 2009 [Journal of Laws of 2009, No. 77, item 649].
- Micherda B., ed., "Kierunki ewolucji sprawozdawczości i rewizji finansowej," [Warszawa: Difin, 2012].
- Mikołajczyk B. and Krawczyk M., "Audyt wewnętrzny w teorii i praktyce ubezpieczeniowej," [Warszawa: PWE, 2010].
- Deloitte and Urząd Komisji Nadzoru Finansowego, "Raport: Współczesna rada nadzorcza 2012. Praktyka ładu korporacyjnego w Polsce," [Warszawa: Polski Instytut Dyrektorów, 2012].
- Urząd Komisji Nadzoru Finansowego, "Rekomendacje dotyczące funkcjonowania komitetu audytu," [Warszawa: Urząd Komisji Nadzoru Finansowego, 2010].
- The Committee on the Financial Aspects of Corporate Governance, "The Financial Aspects of Corporate Governance," *The Cadbury Report*, [London: Gee, 1992].
- Winiarska K., "Audyt finansowy," [Warszawa: PWE, 2009].

Audyt jako mechanizm kontrolny wykorzystywany w zakładzie ubezpieczeń

Audyt występuje w zakładach ubezpieczeń w formie audytu zewnętrznego, wewnętrznego oraz komitetów audytu. Zasadniczym celem ich funkcjonowania jest usprawnianie procesów zarządzania ryzykiem w zakładzie ubezpieczeń, a także zapewnienie prawidłowego generowania informacji w obszarze finansów i rachunkowości. Znaczenie wymienionych mechanizmów kontrolnych wzrosło wraz z wdrożeniem Solvency II, choć ich funkcjonowanie wynika także z prawa bilansowego. Jak pokazują badania zakłady ubezpieczeń posiadają w swoich strukturach wymienione mechanizmy kontrolne, jednak zasady ich funkcjonowania wymagają usprawnienia, na co wskazują nie tylko regulacje Dyrektywy Solvency II, ale także same zakłady ubezpieczeń.

Ze względu na podobieństwo celów realizowanych w zakładzie ubezpieczeń audytów, a także w znacznym stopniu ich zakresu celowe jest także zapewnienie odpowiednich zasad ich wzajemnej współpracy w celu zwiększenia efektywności oraz usprawnienia procesu realizacji zadań audytowych.

W artykule zaprezentowano funkcjonowanie audytu w praktyce zakładów ubezpieczeń, występującego w formie audytu wewnętrznego oraz komitetów audytu, a także zasady współpracy audytu wewnętrznego z audytem zewnętrznym w świetle badań empirycznych.

Słowa kluczowe: ubezpieczenie, rachunkowość zakładów ubezpieczeń, audyt wewnętrzny, audyt zewnętrzny, komitet audytu.

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PIOTR MAJEWSKI

Insurance crime in Poland. Characterization and evolution of the phenomenon

The development of the Polish insurance market is accompanied by the phenomenon of obtaining insurance compensation under false pretences. Initially, it concerned mainly motor insurance. Over time, perpetrators of insurance fraud have targeted other types of property insurance and life insurance. Their methods have become more sophisticated due to a change in the model of insurance crime, which presently manifests the characteristics of organised crime. The Polish Insurance Association and individual insurance companies have managed to develop a range of preventive methods and systemic solutions to prevent insurance fraud. This article presents the current state of knowledge and research results concerning the phenomenon of insurance crime, an overview of typical insurance fraud methods, as well as a summary of the preventive methods used by insurers.

Keywords: insurance crime, insurance fraud, claim fraud, insurance market, Polish Insurance Association [PIU].

Introduction

Insurance fraud has been known for nearly as long as the idea of insurance has been existing in the Polish free market economy. Initially, the phenomenon was the most evident in motor insurance, the major part of the country's insurance market at the time. The problem escalated with the rapid development of mass automotive industry, which began in the 1990s on an unprecedented scale in Poland. It became a nuisance for property insurance companies, which even now generate most of their premium from motor insurance sales. Indemnity payments made under motor insurance policies constitute a major part of insurance companies' costs, and each fraudulent claim worsens the profitability of this product line. The problem has also become noticeable outside the motor insurance industry, and has begun affecting life insurers.

The perception of a car in the Polish society has evolved in the last 20 years. Poland's motorisation level, expressed in the number of passenger cars per 1000 residents, does not diverge from that of other highly developed EU countries, and amounted to 486 in 2012.¹ The perpetrators who had mastered their skills in the 1990s, have learnt to use well-proven fraud methods also in other types of insurance. The perpetrators' *modus operandi* and motives have changed, and so have insurance fraud prevention methods.

The problem of crime affecting motor insurance is still significant. A fundamental cause for this is the above-mentioned popularity of cars and a huge number of claims involving motor vehicles. Official Police records of reported traffic accidents for 2012 show 37,000 traffic accidents resulting in 3,500 fatalities and 46,000 injured, and nearly 340,000 minor collisions.² The above data proves that a traffic incident which results in damage to a vehicle or a bodily injury is a highly probable event, so the mere fact of its occurrence does not automatically raise the insurer's suspicions concerning its circumstances. Only a fraction of the discussed incidents were misrepresented to the insurer or intentionally fabricated in order to obtain illegitimate compensation. On the other hand, perpetrators take advantage of the fact that insurers have to review hundreds of thousands of claims which need to be processed within the statutory term of 30 days.

Over the years, the Polish insurance market has developed tremendously. The changes have affected not only the volume of sales, but – most of all – their structure, where life insurance and non-vehicle property insurance play an increasingly more important role. The perpetrators of insurance fraud gradually adjust to those changes and target new lines of insurance.

This article presents the definition and characteristics of insurance crime, and pay special attention to the major changes it underwent in recent years. Moreover, the author provides data obtained from research on the phenomenon and outlines possible scenarios for the development of insurance crime in the nearest future.

1. Definition and determinants of insurance crime

The Polish legal system has failed to develop a uniform and coherent definition of insurance crime. The act of fraudulently obtaining insurance compensation is made a criminal offence under articles 286 and 298 of the Penal Code (PC). In principle, these provisions apply to the following situations: a misrepresentation made in relation to circumstances in which the loss was caused and an intentional causation of the loss. In reality, the perpetrators' *modus operandi* often does not fit within these categories, and the number of offences contrary to art. 298 is statistically negligible.³

There are multiple definitions of insurance crime.⁴ A coherent definition of insurance crime has been developed for the needs of the insurance industry. According to Insurance Europe, insurance fraud providing untruthful or incomplete information in applications for insurance or answers on an insurance proposal form; submitting a claim for a loss based on misleading or untruthful circumstances, including exaggerating a genuine claim; and otherwise being misleading or untruthful in dealings with

1. Główny Urząd Statystyczny, *Mały Rocznik Statystyczny Polski 2013* (Warszawa: Główny Urząd Statystyczny, 2013), 389.

2. Komenda Główna Policji [National Police Headquarters], *Biuro Ruchu Drogowego, Zespół Profilaktyki i Analiz, Wypadki drogowe w Polsce w 2012 roku* (Warszawa: Instytut Transportu Samochodowego, 2013), 8.

3. "Przestępstwa przeciwko obrotowi gospodarczemu [296–309]," Komenda Główna Policji [National Police Headquarters], Accessed 13, October, 2013, <http://statystyka.policja.pl/portal/st/1119/>.

4. R. Derring, "Insurance Fraud," *The Journal of Risk and Insurance* 69, 3 [2002]: 271–287.

an insurer with the intention of gaining a benefit under the insurance contract.⁵ Insurance fraud brings about many negative consequences for insurers: direct financial losses, less cost- and time-effective claim management, as well as the loss of clients' trust. Detected and undetected fraud is estimated to represent up to 10 per cent of all claims expenditure in Europe.⁶ In 2012, insurance fraud generated losses in excess of PLN 100 million to property insurers in Poland. Over the same period, the Polish life insurance sector lost about PLN 6.5 million. The above definitions and figures relate exclusively to fraud committed to obtain indemnity payments. Therefore, it does not concern, for example, cases of embezzlement of insurance premiums by insurance agents or other types of fraud affecting insurers.

The volumes of life insurance and property insurance sales are increasing every year. In the recent years, the value of gross premium written exceeded PLN 36 and PLN 26 billion for life and property insurance, respectively. Motor third party liability insurance (OC) and motor hull insurance (AC) constituted approx. 55 per cent of the latter amount.⁷ It should be noted that insurance fraud perpetrators and their methods have originally originated from this product group.

Perpetrators of insurance fraud have been classified into three basic groups:⁸

- Situational perpetrators – they were inclined to commit a crime by a difficult financial situation.
- Opportunity perpetrators – they commit an insurance crime on the spur of the moment, often during the adjustment of a legitimate claim.
- Professional perpetrators – members of organised crime rings who use insurance fraud as a regular source of income.

Over the years, the proportions between these categories of insurance fraud perpetrators have changed radically. At the initial stage of the development of insurance crime, a great majority of the perpetrators were the members of the first two nonprofessional groups. As insurers improved their prevention and detection methods they became more efficient in exposing these perpetrators. Currently, the most dangerous and largest group of perpetrators are professionals who have the knowledge and capital that allow them to conduct fraud on a mass scale.

2. The insurance market and insurance crime in numbers

In the last 10 years, the Polish insurance market has changed significantly, in respect of both the size and share of the market for individual product groups. The tables presented below show the changes in sales over last 11 years.

Driven by double-digit upgrade ratios, the sale dynamics in Segment I⁹ resulted in equalling of the sales in Segments I and II in 2005. Since 2006 the sales in Segment I have exceeded these of Segment II by several dozen per cent.

5. Insurance Europe, *The impact of insurance fraud* (Brussels: Insurance Europe, 2013) accessed 13 October, 2013, <http://www.insuranceeurope.eu/uploads/Modules/Publications/fraud-booklet.pdf>.

6. Ibidem.

7. "Opracowania," Komisja Nadzoru Finansowego (Polish Financial Supervision Authority), accessed 13 October, 2013, <http://www.knf.gov.pl/opracowania/rynekubezpieczen/index.html>.

8. R. Dąbrowski, "Praktyka ujawniania przestępczych roszczeń w szkodach majątkowych," in *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne*, (Szczecin: Szczecin-Expo, 2004), 85.

9. In Poland, the Insurance Activity Act has divided the entire insurance market into two Segments: I – life insurance, and II – other personal insurance and property insurance.

Table 1. Gross premium written between 2001–2012 (in thousand PLN)

Year	2001	2002	2003	2004	2005	2006
Life in.	9 259 700	9 901 564	11 167 288	12 735 454	15 323 524	21 108 626
Non life in.	13 122 670	13 254 052	13 602 665	14 895 001	15 658 429	16 424 730
Year	2007	2008	2008	2010	2011	2012
Life in.	25 509 425	38 985 975	30 283 456	31 420 426	31 848 619	36 377 402
Non life in.	18 222 963	20 305 967	21 060 285	22 738 997	25 301 030	26 265 215

Source: the author's own assessment made on the basis of data from the KNF [Polish Financial Supervision Authority].

The Polish Insurance Association¹⁰ is the only institution which has conducted longterm, periodic research concerning the scale and tendencies of insurance crime. The research, conducted since 2001,¹¹ is based on reports provided by all insurers operating in Poland, who annually submit relevant qualitative and quantitative data, and the recorded cases of insurance claim fraud (actually committed and attempted) in particular types of insurance. It is necessary to distinguish cases of committed and attempted fraud because in some instances of attempted fraud insurers decide against taking legal action and consider a refusal to pay an indemnity a sufficient remedy. In such cases, their priority is to protect their financial interests, especially since the identification of the actual perpetrator may be hindered by, for example, the presence of figureheads posing as insureds.

For many years, life insurance companies have been disregarding the problem of insurance crime. An opinion persisted according to which life insurance, unlike motor insurance, was an area unattractive for insurance fraud perpetrators. Life insurers did not monitor the risk related to crime, cases of fraud were rather incidental and treated as exceptions to the rule of “fraud-free” life products. For example, in 2001–2002 Segment I insurance companies reported the fraudulent claims with a total value of approx. PLN 50,000. Only few companies submitted data anyway. The turning point was 2008, when life insurers recorded claim fraud worth approx. PLN 3.6 million. The same year marked a spectacular fraud case perpetrated by a female insurance agent who tried to appropriate PLN 10 million. Since 2008 Segment I insurers began to closely scrutinise the circumstances surrounding contingent payments, which resulted in a rapid increase in the value of disclosed abnormalities. This shift in the focus of fraud perpetrators has been foreseen by foreign insurers, who had already been forced to deal with the very serious problem of insurance crime in life insurance area. It turned out that the staging of an insured event was much easier than expected. The table below presents results of relevant research conducted in the recent years.

The majority of detected insurance crimes were cases of the insured's faked death.

As regards the property insurance segment, since 2006 there has been a strong upward trend in the value of detected claim fraud cases. The share (expressed by both the number and value of claims) of detected motor insurance fraud cases in the general volume of insurance fraud considerably exceeds the share of motor insurance sales in the total sales of property insurance segment.

10. The Polish Insurance Association is a self-regulatory body which represents all the insurance companies operating in Poland.

11. The author's own research, conducted since 2006.

Table 2. Value of insurance crime in the life insurance sector in 2007–2012 (PLN)

Risk	2007	2008	2009	2010	2011	2012
Death of the insured	268 700	2 915 000	1 791 654	2 004 397	3 240 505	4 583 751
Accidental death of the insured	0	0	142 500	143 500	580 000	141 284
Residuals from an accident	11 000	11 000	18 481	63 270	70 080	648 489
Serious illness	39 500	62 000	773 885	625 113	728 238	426 536
Hospitalisation	782 000	8 000	27 138	22 290	32 525	230 287
Permanent inability to work	0	2 000	4 265	2 600	344 670	362 454
Permanent disability, partial or total	22 000	60 000	146 254	43 739	3 139	2 640
Surgical procedures	0	67 000	53 520	92 400	11 550	15 000
Other	141 000	133 000	2 336 980	104 770	1 423 105	0
Total	1 264 200	3 258 000	5 294 678	3 102 079	6 433 812	6 410 441

Source: "Przestępczość ubezpieczeniowa w latach 2001–2011," a report by the Polish Insurance Association, Warszawa, 2012.

Table 3. Value of insurance crimes in the property insurance sector between 2008–2012 (PLN)

Type of cover	2008	2009	2010	2011	2012
Motor Third Party Liability	13 036 000	19 868 923	35 660 347	37 492 759	45 602 921
Motor Hull	22 492 000	23 662 336	16 681 287	32 586 015	36 098 425
Farmers' Liability	845 100	381 675	640 752	56 655	1 050 465
Break-in and theft (business)	2 063 000	900 200	1 315 870	2 333 576	5 986 298
Fire and other perils (business)	2 554 000	6 330 583	4 650 632	9 050 696	4 530 312
Home insurance	693 000	1 618 880	4 012 514	937 429	1 931 755
Travel and Assistance	7 900	197 460	76 110	23 227	32 491
Accident insurance	73 950	901 392	2 290 846	606 880	2 793 837
General Liability	2 394 000	4 311 296	7 243 041	2 895 078	3 028 981
Credit, Financial, D&O	200 000	0	1 796 877	49 812	95 000
Surety cover	0	53 077	0	0	290 089
Other	3 472 500	674 007	662 222	2 043 977	1 875 574
Total insurance	47 831 450	58 899 829	75 030 498	88 076 103	103 316 149

Source: "Przestępczość ubezpieczeniowa w latach 2001–2011," a report by the Polish Insurance Association, Warszawa, 2012.

The above-mentioned values represent about one per cent of total indemnity payments in the property insurance business. In the case of life insurance, the relevant figure is much lower. It must be noted that a significant number of fraud cases remain undetected. Theories explaining the so-called "dark number" of crimes in general suggest that the value of underreported economic crimes can be multiple times higher than the value of the known and detected crimes combined.¹²

12. J. Wójcik, "Główne problemy przestępczości w Polsce z początkiem XXI wieku," *Zeszyty Naukowe Wyższej Szkoły Informatyki Zarządzania i Administracji* 2011, 3(16) [2011]: 1.

3. Methods of committing property insurance fraud

Numerous methods used by insurance fraud perpetrators have long history. In a great majority of cases insurers who employ developed prevention measures are capable of identifying fraud already during the preparation of an insurance agreement. Some longknown fraud methods, previously used by individual perpetrators, have been reinvented by organised crime rings that apply them through a group of figureheads seemingly not related to each other. The general purpose of classic fraud methods used in motor insurance is to obtain compensation in excess of the actual value of the vehicle or the repair cost. They include the following:¹³ intentionally causing a traffic collision, staging a traffic collision which involves vehicles damaged during a previous incident, making multiple reports of the same loss to several insurers, misrepresenting circumstances of an event in order to receive indemnity that normally would not be awarded under an insurance policy, predating a policy, and reporting a vehicle stolen after it was sold.

Apart from using the long-used insurance claim fraud methods, perpetrators have invented new measures or significantly modified the existing ones. The major issues that currently contribute to the existence of insurance claim fraud are outlined below.

The abuse-prone national system of vehicle registration is one of the major drivers of insurance crime. Legal regulations currently in force can be abused to register vehicles which do not exist in reality, or to create duplicate vehicle identities (VINS). One of the reasons for this state of affairs is the abuse-prone system of national vehicle inspection built around vehicle inspection stations (*stacje kontroli pojazdów*, SKP), as well as SKPs failure to properly use and update the online databases of the Central Register for Vehicles and Drivers (*Centralna Ewidencja Pojazdów i Kierowców*, CEPiK). Sometimes, fraud perpetrators use documents of a foreign vehicle – usually a totalled vehicle or even a salvage vehicle scrapped abroad – to register it in Poland. Such a vehicle identity is then used to obtain a motor hull cover, which is usually done with the help of a corrupt or inexperienced employee of an insurance company.

Apart from extorting money for fictional vehicle repairs, insurance fraudsters have developed a new dangerous method of exploiting coverage guaranteed under third party liability insurance.¹⁴ Here, the most frequent type of fraud are personal injury scams, which involve claims related to the bodily injury allegedly suffered by passengers of a vehicle. Recent changes in social awareness related to the highly-publicised subject of aviation accidents and compensation awarded to victims of such accidents have significantly influenced the popularity of fraudulent claims of that type. Personal injury scams usually relate to conditions difficult to prove and diagnose, for example postaccident depression and trauma, headaches or backaches. Frequently, perpetrators deliberately stage minor traffic collisions which involve a vehicle packed with passengers who report similar claims supported by detailed medical documentation. There are also instances of fraudulent claims for substitute vehicles and the loss of income caused by damages caused to a vehicle participating in an accident.

Apart from fraud cases involving third party liability and motor hull insurance, a significant number of fraudulent theft and fire claims have been observed. These events constitute a signifi-

13. Polska Izba Ubezpieczeń, *Przestępczość ubezpieczeniowa w latach 2001–2011, Analiza danych sporządzona dla Polskiej Izby Ubezpieczeń*, (Warszawa: Polska Izba Ubezpieczeń, 2012).

14. Art. 34 of the Compulsory Insurance Act (Journal of Laws of 2003, No. 124, item 1152, as amended).

cant share of the cases of insurance claim fraud detected in research. Here, the perpetrators are businesses who deliberately stage accidents in order to obtain financial gains. The scam is usually accompanied by collateral circumstances such as deterioration of the company's financial situation which directly precedes the extortion attempt. In the mind of perpetrators, a faked fire or burglary is a way of improving the financial condition of the business. Regretfully, it is organised crime groups who increasingly more frequently attempt to claim compensation by causing large fires or otherwise damaging business property. Such scams involve a network of shell companies engaged in fictional, "paper", transactions faking physical flows of goods. Having obtained a favourable insurance policy, the perpetrators generate a loss and advance a claim supported by fabricated documentation.

Insurance fraud perpetrators also target business insurance products. This type of fraud is exceptionally difficult to detect, which minimizes the risk for perpetrators. The mechanism of extortion involves the founding of a shell company or the forging of accounting documents of an existing enterprise for the purpose of declaring inflated turnover and profit. After a while, the company is driven to bankruptcy, and the insurer is often forced to pay a very high compensation.

4. Methods of committing life insurance fraud

Available data shows that "traditional" life insurance products are still a popular target of insurance fraud perpetrators.¹⁵ Administrative procedures used for the registration of deaths at Registry Offices can be easily exploited by a fraudulent client to fake the death of an insured in order to report a fictional claim to an insurance company. Many insurers automatically pay death benefits without checking additional circumstances that usually accompany a demise of an insured person. Furthermore, perpetrators can take advantage of the defunct death registration procedures to obtain death certificates based on forged or fabricated documents. Insurers must address these popular methods of life insurance fraud by reinforcing standard claim review procedures until the gaps in the state-operated civil registry system are closed.

Similar procedural loopholes make it possible to fraudulently claim benefits under hospital, permanent disability or serious illness policies. The low quality of medical records kept by public healthcare providers is a factor which prevents the effective verification of the insured person's actual health condition and medical history. As shown above, a great majority of life insurance claims are based on simple methods which exploit procedural imperfections and the inefficiency of the state-operated administrative and healthcare systems. Efficient prevention of fraud will only be possible if the civil registry and medical databases are improved.

Other typical but less frequently occurring cases of life insurance fraud reported by insurers include self-inflicted injuries, mainly intentional finger amputations and burns.

Over the last 10 years the problem of internal crime has also been noticeable. Cases involving the embezzlement of insurance premiums have become especially puzzling in the era of the commonly used IT solutions. It is very difficult to prevent insurance agent impersonation. On the other hand, the efficacy of preventing fraud committed by employees of insurance companies depends exclusively on the organisational efficiency of a given organisation.

15. Polska Izba Ubezpieczeń, *Przestępczość ubezpieczeniowa w latach 2001–2011*, 15.

Life insurance is a new area of interest for organised crime groups. The analysis of selected cases reported by employees of insurance companies reveals that the perpetrators often act in an organised manner and use a number of different persons in scams, which substantially lowers the effectiveness of the classical methods of detecting cases of misappropriation. Perpetrators have extensive knowledge of insurers' procedures and frequently resort to corrupting employees of insurance companies, personnel of healthcare providers and other professionals involved in a claim adjustment process.

It needs to be remembered that many of the claim fraud prevention methods applied to Segment II are perfectly usable in Segment I. A lot of information may be obtained from the comparison of data about fraud perpetrators. Currently, Polish insurers take extensive measures to ensure that the anti-fraud systems used in both Segments are equally effective.

5. Modern methods of insurance crime prevention

As it was emphasized above, insurance crime is a long-known phenomenon that has been changing rapidly over the years. Even if perpetrators' *modus operandi* has been identified and addressed by the implementation of appropriate preventive measures, this may prove to be only a short-term solution because the once detected methods tend to be immediately replaced with new, more sophisticated ones. This poses a challenge for insurance companies and the entire industry and entails the necessity of taking long-term, systemic action to tackle the problem.

Insurers have significantly changed their approach to fighting insurance crime. A few years ago, the detection of a fraud attempt depended mainly on the skills of employees with the claims department who reviewed claims for fraud using their knowledge and professional experience. Procedures used to assess the risk of fraud for a given claim were highly imprecise and quite difficult to be uniformly reproduced. Loss adjusters could not in any way verify whether or not a reviewed vehicle had already been insured, or if a similar loss had been reported earlier, for example, in a different city. A study conducted among employees of insurance companies by the author of this article in 2006 revealed that for virtually all respondents a fundamental problem in fighting insurance claim fraud was the inability to exchange information about claimed losses.¹⁶

Both the perpetrators' methods and means of preventing insurance fraud have significantly evolved. Nevertheless, thanks to the continuous development of anti-fraud measures perpetrators no longer go unpunished.

The discussed participation of organised crime rings is another important problem. It is much more difficult for insurers to combat fraud schemes which involve large numbers of individuals, seemingly unrelated to each other, who play roles written by the ring leaders. At first glance, fraudulent claims made by members of the scheme do not display common features of fraud. Only a careful search of databases and the use of advanced IT tools enable insurers to prove otherwise. Another problem is the increasing impertinence and professionalism of perpetrators, who have enough means to employ experts or professional agents in their attempts to claim compensation. In extreme cases, crime rings resort to corrupting employees of insurance companies and law enforcement officials.

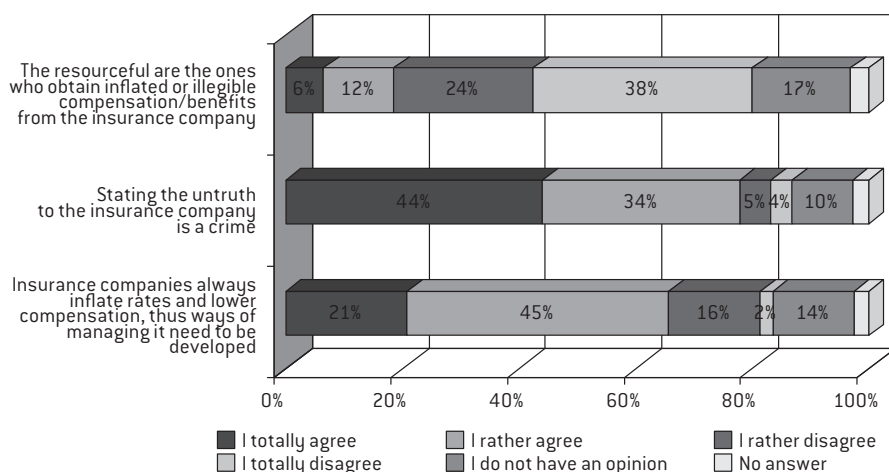
16. P. Majewski, "Przestępczość ubezpieczeniowa w ubezpieczeniach komunikacyjnych – wyniki badań," in *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne*, (Szczecin: Szczecin-Expo, 2008): 147.

The Commission for the Prevention of Insurance Crime (*Komisja ds. Przeciwdziałania Przystępczości Ubezpieczeniowej*, KPPU) of the Polish Insurance Association (*Polska Izba Ubezpieczeń*, PIU) has developed a range of systemic solutions to tackle insurance crime, including draft pieces of legislation and principles of data exchange systems. The PIU has also commissioned periodic studies of the phenomenon, which verified the assumptions and drew a picture of the present trends. An opportunity to access the data collected by the Information Centre of the Insurance Guarantee Fund – which stores information on third party liability and motor hull policies and the indemnity payments made under these policies – has proven to be of an invaluable significance for these works. The long-term cooperation within the insurance community has led to achieve good recognition of the problem. Currently, the information on and the knowledge of insurance fraud mechanisms are the basic tools used to reviews claims' legitimacy. Motor insurers have been very successful in detecting and fighting compensation fraud. Insurance claim fraud can be fought more effectively also because of the centralisation and computerisation of claim adjustment processes, which now can be monitored in much greater detail than it was possible several years ago.

6. Social reception of the phenomenon of insurance crime

The knowledge of insurance fraud prevention methods is promoted among employees across all levels of insurance organisations. Thematic conferences are being held to that end, for example the International Conference on Insurance Crime which took place in Szczecin in 2013 for the sixteenth time. They are directed not only at employees of claims departments, but also at the sales staff. The knowledge of fraud symptoms allows insurance personnel to eliminate from a group of prospects those who conclude insurance agreements motivated by a quick profit.

Chart 1. Perception of insurance crime



Source: the author's own research.¹⁷

17. A survey of secondary school students from Gdańsk, Toruń, Poznań and Warsaw, carried out between April and May 2013 (n = 1043 persons) by students of the University of Gdańsk, the Nicolaus Copernicus University in Toruń, the WSB School of Banking in Toruń, the Poznań University of Economics and the Warsaw School of Economics, led by Marcin Kawiński, Marek Kurowski, Krzysztof Łyskawa, Piotr Majewski, Damian Walczak.

What needs to be emphasised is the importance of constant research and promotion of knowledge of fraud not only among insurance employees, but also among people who work with them (law enforcement authorities, experts, workshops), as well as insurance companies' clients themselves.¹⁸

It is especially the latter group that plays an important role by passively taking part in the process of giving the "social consent" for insurance crime, which is still a notion widely accepted by the public.¹⁹ Unfortunately, a person who commits fraud to the financial detriment of an insurance company is not explicitly stigmatised by the society.²⁰

However, the results of periodically conducted research indicate that the situation slowly improves. It appears that a major factor driving this change is the raising of the awareness of insurance crime and its social consequences, which indirectly affect all honest citizens who have to pay the cost of insurance fraud.

Table 4. Consent to insurance crime

Expressing indifference to insurance crime	2011	2013
IT DOES NOT CONCERN ME AT ALL that someone fraudulently claims compensation under a policy	19.8%	19.2%
IT CONCERNS ME JUST A LITTLE that someone fraudulently claims compensation under a policy	23.8%	23.5%

Source: *Diagnoza Społeczna* [Social Diagnosis], 2013, <http://www.diagnoza.com>

Many insurance companies conduct extensive social and educational campaigns directed at improving the social perception of the insurance industry. Such activities are capable of bringing visible effects in the foreseeable future, and – though they are only indirectly related to the issue at hand – they are among the most effective tools available in the fight against insurance crime.

Conclusions

Polish insurance companies have been struggling with insurance crime for over 20 years. This phenomenon has been relatively well-recognised, and in the last few years the industry has developed efficient tools and methods for detecting, combating and preventing insurance fraud. The said process, initiated years ago and continued ever since, must be based on research and constantly adjusted to the dynamically changing determinants and trends. What cannot be underestimated is the discussed tendency for the professionalization of insurance crime. Solutions developed in the motor insurance sector provide a perfect foundation for measures to tackle fraud in other

18. J. Handschke, "Kompleksowe, ujednolicone i konsekwentne podejście zakładu ubezpieczeń do przestępczości ubezpieczeniowej jako warunek skutecznego przeciwdziałania temu zjawisku," in *Przestępczość Ubezpieczeniowa* (Szczecin Szczecin-Expo, 2010): 299.

19. T. Szumlicz, "Problem przyzwolenia społecznego na przestępstwa ubezpieczeniowe," in *Przestępczość Ubezpieczeniowa* (Szczecin Szczecin-Expo, 2010): 316.

20. P. Majewski, "Przyzwolenie społeczne na przestępczość ubezpieczeniową – wyniki badań," in *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne* (Szczecin Szczecin-Expo, 2012): 320.

areas of the insurance industry. Currently, they are being successfully implemented in the sector of life insurance.

To sum up, it is worth re-iterating that over the last few years enormous progress has been made in fighting insurance crime on the Polish insurance market.

References

- Komisja Nadzoru Finansowego. *Biuletyn Kwartalny. Rynek Ubezpieczeń IV/2012*. Komisja Nadzoru Finansowego, 2013. Accessed 13 October, 2013. http://www.knf.gov.pl/opracowania/rynek_ubezpieczen/Dane_o_rynku/Dane_kwartalne/dane_kw.html.
- Cywoniuk J., "Polski rynek ubezpieczeniowy a czynniki determinujące rozwój przestępczości." in *Ubezpieczenia w polskim obszarze Rynku Europejskiego. Wyzwania i oczekiwania*, edited by S. Nowak and T. Kopczyńska. Warszawa: Oficyna wydawnicza Branta, 2003.
- Dąbrowski R., "Praktyka ujawniania przestępczych roszczeń w szkodach majątkowych," in *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne*. Szczecin: Szczecin-Expo, 2004.
- Derring, R. "Insurance Fraud." *The Journal of Risk and Insurance* 69, 3 (2002).
- Czapiński J., Panek T. eds., *Diagnoza społeczna 2013* (Warszawa: Rada Monitoringu Społecznego, 2013) accessed October 13, 2013, <http://www.diagnoza.com>.
- Komenda Główna Policji (National Police Headquarters). "Przestępstwa przeciwko obrotowi gospodarczemu (296–309)." Accessed 13 October, 2013.
- Handschke J., "Kompleksowe, ujednolicone i konsekwentne podejście zakładu ubezpieczeń do przestępczości ubezpieczeniowej jako warunek skutecznego przeciwdziałania temu zjawisku." In *Przestępczość Ubezpieczeniowa*. Szczecin: Szczecin-Expo, 2010.
- Majewski, P. "Przestępczość ubezpieczeniowa w ubezpieczeniach komunikacyjnych - wyniki badań." In *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne*. Szczecin: Szczecin-Expo, 2008.
- Majewski P., "Przyzwolenie społeczne na przestępczość ubezpieczeniową – wyniki badań." In *Przestępczość Ubezpieczeniowa, Materiały Konferencyjne*. Szczecin, 2012.
- Główny Urząd Statystyczny. *Mały Rocznik Statystyczny Polski 2013*. Warszawa: Główny Urząd Statystyczny, 2013.
- Report, *Analiza danych dotyczących przestępstw ujawnionych w latach 2001–2011 w związku z działalnością zakładów ubezpieczeń – członków Polskiej Izby Ubezpieczeń*. Warszawa, 2012.
- Insurance Europe, "The impact of insurance fraud," Brussels: Insurance Europe, 2013. Accessed 13 October, 2013. <http://www.insuranceeurope.eu/uploads/Modules/Publications/fraud-booklet.pdf>.
- Szumlicz T., "Problem przyzwolenia społecznego na przestępstwa ubezpieczeniowe," in *Przestępczość Ubezpieczeniowa*. Szczecin: Szczecin-Expo, 2010.
- Wójcik J., "Główne problemy przestępczości w Polsce z początkiem XXI wieku," *Zeszyty Naukowe Wyższej Szkoły Informatyki Zarządzania i Administracji w Warszawie* 3(16) (2011).
- Komenda Główna Policji, Biuro Ruchu Drogowego, Zespół Profilaktyki i Analiz, "Wypadki drogowe w Polsce w 2012 roku," Warszawa: Instytut Transportu Samochodowego, 2013.

Przestępczość ubezpieczeniowa w Polsce. Charakterystyka i ewolucja zjawiska

Rozwojowi polskiego rynku ubezpieczeń towarzyszy zjawisko wyłudzenia odszkodowań. Początkowo dotyczyło ono głównie ubezpieczeń komunikacyjnych. Wraz z upływem czasu sprawcy takich przestępstw zainteresowali się innymi rodzajami ubezpieczeń majątkowych i ubezpieczeniami na życie. Metody wyłudzenia stały się bardziej wyrafinowane ze względu na zmianę działalności przestępczej, która obecnie wykazuje cechy przestępczości zorganizowanej. Polska Izba Ubezpieczeń oraz same zakłady ubezpieczeń zdołały opracować szereg metod zapobiegawczych oraz rozwiązań systemowych, które przeciwdziałają wyłudzeniom. W artykule przedstawiono aktualny stan wiedzy i wyniki badań dotyczących zjawiska przestępczości ubezpieczeniowej, przegląd typowych metod wyłudzeń oraz wykorzystywanych metod zapobiegawczych.

Słowa kluczowe: przestępczość ubezpieczeniowa, wyłudzenie odszkodowań, rynek ubezpieczeniowy, PIU.

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