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THE (UN)LIMITED USE OF AI SEGMENTATION IN THE INSURANCE SECTOR

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Although the implementation of AI and big data benefits insurers, pervasive segmentation through AI has some negative implications and could entail serious ramifications for policyholders if their risk is incorrectly calculated. In Belgium, the current insurance regulation does contain some existing restrictions that limit the freedom of insurers to use AI; nevertheless, these provisions fall short of protecting policyholders from inaccuracies in their risk assessments and thus from receiving incorrect premiums or conditions.

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THE (UN)LIMITED USE OF AI SEGMENTATION IN THE INSURANCE SECTOR

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Abstract

In theory, under the premise of freedom of will, insurers in Belgium are permitted to employ artificial intelligence ('AI') and big data analytics for segmentation purposes, enabling them to determine the 'claims probability' (i.e., the likelihood and severity of potential claims) for each prospective policyholder. This analytical approach empowers insurers to determine whether or not they should underwrite a risk, and if so, on what terms. A more extensive pool of policyholder data may increase the accuracy of the assessment of claim probability and surpasses the information asymmetry between the policyholder and insurer.

Although the implementation of AI and big data benefits insurers, pervasive segmentation through AI has some negative implications and could entail serious ramifications for policyholders if their risk is incorrectly calculated. In Belgium, the current insurance regulation does contain some existing restrictions that limit the freedom of insurers to use AI; nevertheless, these provisions fall short of protecting policyholders from inaccuracies in their risk assessments and thus from receiving incorrect premiums or conditions.

I. Introduction

1. It is imperative for insurers to identify the type of risks they are underwriting. This identification involves an estimation of the 'claims probability' (i.e. the risk of claims occurring and their magnitude) of each prospective policyholder, which results in the establishment of a risk profile. This so-called segmentation technique enables insurers to determine whether to underwrite a risk and if so, on what terms (i.e. the premium and conditions of an insurance contract).

Wielding the segmentation technique not only necessitates the amassment of certain information regarding prospective policyholders and the insured risk but also processing the harvest. In this respect, statistics are essential in the insurance industry. After all, without the analysis of historical data, it is impossible to predict the risk of existing or prospective policyholders. Of late, a new wind is blowing in the insurance industry. Whereas in the past, risk data was static and incomplete, the insurance industry can now rely on artificial intelligence (hereinafter: 'AI') and big data. The latter supplements the standard data with new and non-traditional information and the former opens avenues for the accurate prediction of individual risks of policyholders and, consequently, more tailored premiums and policy conditions.[1]

[1] DELOITTE, *From mystery to mastery: Unlocking the business value of Artificial Intelligence in the insurance industry*, 2017, www2.deloitte.com/, 99; SCOR, *The impact of artificial intelligence on the (re)insurance sector*, March 2018, www.scor.com, 8; BEUC, *The use of big data and artificial intelligence in insurance*, May 2020, www.beuc.eu, 6; M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 7; BAFIN, *Big data meets artificial intelligence – Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 96 and 107; AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 12-13.

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This chapter addresses the following profound question: can (Belgian) insurance companies use AI to determine a policyholder's claim probability? Answering this question requires first of all some contextual guidance, which is provided by clarifying the segmentation technique and the concepts of AI and big data (A.).[2] Second, this paper discusses both the potential benefits and pitfalls of AI segmentation for both insurers and policyholders (B.). Focusing on the Belgian Insurance Act[3] the final part of this contribution sketches the insurer's freedom to use AI as well as the relevant legal (in)direct limitations.[4] In addition, that section also examines whether the aforementioned restrictions protect the policyholder from erroneous decisions made by an AI system (C.).[5]

II. AI and insurance segmentation

A. Data collection and analysis for the purpose of segmentation

2. The assessment of the risk potential policyholders represent is crucial for insurers. After all, it is in the insurer's interest to underwrite risks that are not too big. Likewise, the insurer must be able to neutralise larger risks with smaller ones.[6] This implies that the insurer must estimate the claims probability of each prospective policyholder. By means of such estimations, the insurer can establish risk profiles and divide policyholders into risk groups with the same (or similar[7]) profile.[8]

This division of policyholders into homogeneous groups with the same risk profile based on statistics and prediction models is called 'segmentation'.[9] Segmentation is beneficial for both the insurer and the (potential) policyholder. On the one hand, segmentation enables the insurer to differentiate the terms of an insurance contract according to some specific characteristics of the risk ('segmentation criteria').[10] On the other hand, this differentiation also benefits the policyholder, because the insurance contract will be tailored to his particular situation.

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[2] This chapter focuses on the use of AI for the analysis of big data. To facilitate reading, we have opted to use only the term 'AI', instead of 'AI and big data'.

[3] Wet van 4 april 201 betreffende de verzekeringen, *BS* 30 april 2014.

[4] The focus on the Belgian Insurance Act entails, among other things, that this contribution will not delve into the data protection regulation and its relation to AI segmentation.

[5] This chapter only addresses the relationship between the insurer and its policyholder. Public-law sanctions that could be imposed by the Financial Services and Markets Authority in Belgium (the 'FSMA') are not within this contribution's ambit.

[6] E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 21.

[7] A complete equivalence of claim probability and size of the claim within each group is almost impossible as the insurer cannot always consider all types of factors to calculate risk (see *infra*).

[8] T. VANSWEEVELT and B. WEYTS, *Handboek Verzekeringsrecht*, Antwerpen, Intersentia, 2016, 42; E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 16; Ph. COLLE, *Algemene beginselen van het Belgische verzekeringsrecht (zevende editie),* Mortsel, Intersentia, 2019, 3.

[9] M. FONTAINE, *Verzekeringsrecht*, Brussel, Intersentia, 2017, 15; Y. THIERY, *Discriminatie en verzekering*, Antwerpen, Intersentia, 2011, 188.

[10] T. VANSWEEVELT and B. WEYTS, "Deel I. Het belang, de kenmerken en situering van het verzekeringsrecht", in T. VANSWEEVELT and B. WEYTS (eds.), *Handboek Verbintenissenrecht,* Antwerpen, Intersentia, 2016, 42; D.E. PALMER, "Insurance, risk assessment and fairness: an ethical analysis", in P. FLANAGAN, P. PRIMAUX and W. FERGUSON (eds.), *Insurance ethics for a more ethical world, Research in ethical issues in organizations*, Vol. 7, Oxford, Elsevier, 2007, 114.

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Segmentation criteria are used to calculate both the probability of a claim occurring and the size of the claim if it actually occurs.[11] Each policyholder in the same risk group will be designated an equal probability and size of the claim warranting an equal treatment, for instance, with respect to insurance terms. As such, segmentation determines the underwriting, pricing, terms, and/or scope of coverage of an insurance contract.[12] The insurer will charge high-risk policyholders a higher premium and stricter conditions or can decide not to grant them any coverage. Lower-risk policyholders will obtain lower risk premiums and/or better conditions and are less likely to be excluded from coverage.[13]

3. To apply the segmentation technique, the insurer needs to obtain data regarding the prospective policyholder and the insured risk.[14] Traditionally, the insurer collects information by presenting the policyholder with an insurance proposal. The policyholder must complete this form to inform the insurer of the transaction's nature and of the facts, as well as the circumstances that enable the insurer to assess the risks.[15] Belgian insurance law obligates the policyholder to spontaneously and accurately communicate all known information that may influence the insurer's risk assessment. This obligation is restricted to data the policyholder deems relevant. He need not communicate circumstances that the insurer already knew or should reasonably have known.[16] The information asymmetry and, in this respect, the vulnerable position of the insurer vis-à-vis the policyholder justifies this spontaneous disclosure obligation. The former has little or no knowledge of the characteristics of the risk. This legal obligation of the policyholder allows the insurer to trust the policyholder to correctly communicate the characteristics of the risk.[17]

The traditional method set out above, is, despite the obligation of the policyholder, somewhat one-sided. Nowadays, risks represented by policyholders can be predicted by employing AI. The new era of AI gives the insurers access to (non-traditional) information that is (more) comprehensive, accessible from multiple (external) sources, and available on a real-time basis.[18] This data often involves actions that occur in the online world, such as banking app transactions, e-mail traffic, videos, images, clickstream, search queries, social media interactions, and so on. These sources include information about users' private lives, such as their interests and certain life events. Social data, such as likes or posts on social media, in addition to traditional data, could predict whether or not a potential policyholder exhibits a high claim probability. As a fictional example, a page on Facebook is called 'I like driving fast'

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[11] K. S. ABRAHAM, "Efficiency and Fairness in Insurance Risk Classification", *Virginia Law Review* 1985, Vol. 71, Issue 3, 408; M. FONTAINE, *Verzekeringsrecht*, Brussel, Intersentia, 2017, 15.

[12] K. S. ABRAHAM, "Efficiency and Fairness in Insurance Risk Classification", *Virginia Law Review* 1985, Vol. 71, Issue 3, 408; M. FONTAINE, *Verzekeringsrecht*, Brussel, Intersentia, 2017, 15.

[13] J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 407.

[14] BEUC, *The use of big data and artificial intelligence in insurance*, 19 May 2020, www.beuc.eu, 3.

[15] Article 55, 6° of the Insurance Act.

[16] Article 58, the first paragraph of the Insurance Act.

[17] Ph. COLLE, *Algemene beginselen van het Belgische verzekeringsrecht (zevende editie)*, Mortsel, Intersentia, 2019, 58.

[18] DELOITTE, *From mystery to mastery: Unlocking the business value of Artificial Intelligence in the insurance industry*, 2017, www2.deloitte.com/, 99; SCOR, *The impact of artificial intelligence on the (re)insurance sector*, March 2018, www.scor.com, 8; BEUC, *The use of big data and artificial intelligence in insurance*, May 2020, www.beuc.eu, 6; M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 7.

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and statistical analysis of historical data shows people that like this page are more likely to crash their car, the AI algorithm could pick up on this correlation and could conclude this risk will not be underwritten or the premium for those policyholders will increase.[19] Needless to say, this wide array of information gives insurers increased insights regarding existing and prospective policyholders.[20]

Access to a large(r) amount of data regarding policyholders increases the accuracy of the assessment of claim probability and surpasses the information asymmetry between the policyholder and insurer.[21] An insurer who has vast amounts of data and advanced analytical capabilities at its disposal could even be said to tilt the informational imbalance in its favour, rendering the insurance proposal and the spontaneous disclosure requirement obsolete. After all, insurers will be better equipped to collect and process information regarding the risk of policyholders without having to ask them. This makes it a lot harder for a policyholder to commit fraud by feeding the insurer misleading information.[22]

B. The benefits and challenges of AI segmentation

1. Benefits

4. Fully grasping the advantages of AI and big data requires us to illuminate the traditional method and its outcomes. After all, the traditional method is the benchmark. Compared to the traditional method, AI and big data allow for *(i)* a realistic risk prediction, *(ii)* hyper-individualisation, *(iii)* (theoretically) a true chance solidarity, *(iv)* an advantage in the marketplace, and *(v)* a better prevention of risks from occurring and/or a better minimization of their effects.

5. AI allows insurers to fine-tune their risk assessments *(i)* because the former enables the latter to identify and analyse a much larger number of segmentation criteria.[23] The combination of AI and big data uncovers correlations that (simple) statistics may not be able to find. Whereas traditionally proxies are used to estimate the risk (e.g. the driver's age), AI now allows insurers to use real risk-prediction factors For example, insurers could use criteria, such as aggressive driving style, which can be detected through telematics. In vehicle insurance, AI can be used to automatically record information about the policyholder and the vehicle (so-called 'telematics': the use of *tele*communications and infor*matics*, also called 'usage-based insurance' or 'UBI'). In this process, the insurer installs a device in the vehicle that collects the data used to estimate risk. With telematics, the risks are assessed not only based on secondary (proxy) data (such as the place of residence and age of the policyholder or data concerning the vehicle), but based on primary data regarding the driving behaviour of

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[19] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 185.

[20] M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 7.

[21] SCOR, *The impact of artificial intelligence on the (re)insurance sector*, 2018, www.scor.com, 8; C.P. HOLLAND, M. MULLINS and M. CUNNEEN, "Creating Ethics Guidelines for Artificial Intelligence (AI) and Big Data Analytics: The Case of the European Consumer Insurance Market", *Patterns* 2021, Vol. 2, Issue 10, 2.

[22] SCOR, *The impact of artificial intelligence on the (re)insurance sector*, 2018, www.scor.com, 8.

[23] A. J. HERAS, P.-CH. PRADIER and D. TEIRA, "What was fair in actuarial fairness?", *History of the Human Sciences* 2020, Vol. 33, Issue 2, 91; OECD, *The Impact of Big Data and Artificial Intelligence (AI) in the Insurance Sector*, 2020, www.oecd.org, 14.

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the policyholder (such as braking behaviour, speeds used, the way of cornering, distance travelled, etc.) as well as the driving conditions (such as weather, surrounding traffic, time of day, the road used, etc.). The collected, dynamic data leads to a more accurate risk assessment and calculation of insurance premiums, possibly even in real-time.[24]

6. AI could establish a hyper-individualisation of risks in the insurance sector and leads to a so-called 'customised insurance' *(ii)*.[25] The traditional statistical method enables the insurer to delineate risk groups and to identify several sub-groups.[26] The amount of parameters correlates negatively with the size and heterogeneity of the risk groups.[27] Individual segments would thus technically decrease in size and increase in number.[28] AI intensifies this process. It allows to differentiate thoroughly risks represented by policyholders until it shifts from macro to rather micro-segmentation, and even to the extent where risks could be identified at an individual level.[29] Due to this customisation, insurers can more accurately match their prices and terms to the risk represented by each policyholder.[30]

7. In some cases, AI could lead to achieving a true chance solidarity *(iii)*. The idea of solidarity is one of the roots of insurance. All policyholders commit to paying the costs of future damage and they do so without knowing who will suffer the consequences in case the underwritten risk occurs. Solidarity, in this respect, entails a transfer of wealth. After all, when the underwritten risk materialises, members of the risk group who did not suffer damages collectively carry the burden with those who did. The token of this wealth transferring solidarity is the payment of the premium by every member of the risk group while only those who suffer a loss receive compensation.[31]

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[24] NAIC and CIPR, *Usage-Based Insurance and Vehicle Telematics: Insurance Market and Regulatory Implications*, March 2015, www.naic.org, 2; R. VERBELEN, K. ANTONIO and G. CLAESKENS, "Unraveling the predictive power of telematics data in car insurance pricing", *J. R. Stat. Soc. C.* 2018, Vol. 67, Issue. 5, 1276; J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 412-413; RATHENAU INSTITUUT (J. TIMMER, I. ELIAS, L. KOOL and R. VAN EST), *Berekende risico's. Verzekeren in de datagedreven samenleving*, 2015, www.rathenau.nl, 29 and 48.

[25] SCOR, *The impact of artificial intelligence on the (re)insurance sector*, March 2018, www.scor.com, 8 and 26; BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 122; THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 7; EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 29; M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 19.

[26] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 102.

[27] SCOR, *The impact of artificial intelligence on the (re)insurance sector*, March 2018, www.scor.com, 8; BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 107, 122.

[28] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 102; EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 32; AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 21.

[29] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 102-103.

[30] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 122; THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 7.

[31] Y. THIERY, *Discriminatie en verzekering*, Antwerpen, Intersentia, 2011, 191; B. WEYTS, "Het segmentatiebeleid van de verzekeraars: krachtlijnen en wijzigingen ten gevolge van de Verzekeringswet van 4 april 2014", in T. VANSWEEVELT en B. WEYTS, *De Verzekeringswet 2014*, Mortsel, Intersentia, 2015, 31; E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 22-23; J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of

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At least two kinds of solidarity can be distinguished when considering the homogeneity of risk groups: 'chance solidarity' and 'subsidising solidarity'.[32] Chance solidarity involves a wealth transfer by chance since the risk groups of policyholders are completely homogeneous. Every member of the group has an equal chance of the risk occurring, and the lucky ones thus pay for the unlucky ones.[33] Heterogeneous risk groups give rise to subsidising solidarity. Heterogeneous groups do not consist of members with a comparable risk profile. In this situation, some members will be insured with disproportionate conditions compared to the actual risk they represent. These low-risk members are forced to subsidise the high-risk members.[34] A vehicle liability insurance that requires every policyholder to pay the same premium exemplifies subsidising liability. After all, cautious drivers will inevitably pay a share of the claims cost caused by high-risk drivers.[35]

Sidestepping or minimising subsidising solidarity is closely connected to segmentation. The more refined the segmentation, the less subsidising solidarity occurs.[36] Segmentation, thus, benefits insurers. The pursuit of establishing chance solidarity and the need to make risk groups as homogeneous as possible are driven by the insurer's desire to counteract policyholder's subsidy-aversion[37], and to combat particular economic insurance perils, such as adverse selection[38] and moral hazard[39].[40] Thorough segmentation allows insurers to charge

Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 417.

[32] Y. THIERY, *Discriminatie en verzekering*, Antwerpen, Intersentia, 2011, 192; E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 22-23.

[33] N. DE PRIL and J. DHAENE, *Rapport van de werkgroep*, September 1995, https://feb.kuleuven.be, 12; Y. THIERY, *Discriminatie en verzekering*, Antwerpen, Intersentia, 2011, 192.

[34] N. DE PRIL and J. DHAENE, *Rapport van de werkgroep Segmentering*, September 1995, https://feb.kuleuven.be, 12; Y. THIERY, *Discriminatie en verzekering*, Antwerpen, Intersentia, 2011, 192; E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 23; J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 418.

[35] AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 20.

[36] L. SCHUERMANS and C. VAN SCHOUBROECK, *Grondslagen van het Belgische verzekeringsrecht, 3de editie*, Mortsel, Intersentia, 2015, 32; AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 20.

[37] A policyholder who believes that he has a contract that is not aligned with his risk might opt to seek another insurer that offers him better, more appropriate, conditions.

[38] The higher a policyholder thinks his risk is, the more important he will consider underwriting his risk. When insurance contracts are virtually the same for all policyholders (both those who represent a bad risk and those who represent a good risk), policyholders who represent a good risk will cancel the insurance over time, given that their premium is not balanced and they are informed that they have little or no need for the insurance. When the good risks drop out, the premium will increase for those left behind.

[39] Moral hazard refers to the potential negative effect insurance has on loss prevention. Without insurance, the prospect of accidents and damages provides an incentive to avoid losses by taking precautions. When a person chooses to underwrite his risk, this incentive disappears, and he will behave less carefully as he knows that the occurrence of his claim is covered and he will not have to take responsibility for the adverse financial consequences.

[40] W.P.J. WILS, "Insurance Risk Classifications in the EC: Regulatory Outlook", *Oxford Journal of Legal Studies* 1994, Vol. 14, Issue 3, 452-454; D.E. PALMER, "Insurance, risk assessment and fairness: an ethical analysis", in P. FLANAGAN, P. PRIMAUX and W. FERGUSON (eds.), *Insurance ethics for a more ethical world, Research in ethical issues in organizations*, Vol. 7, Oxford, Elsevier, 2007, 124; FTC, *Credit-based insurance scores: impacts on consumers of automobile insurance: a report to Congress*, July 2007, www.ftc.gov, 43-44; R. SWEDLOFF, "Risk Classification's Big Data (R)evolution", *Connecticut Insurance Law Journal* 2014, Vol. 21, Issue 1, 346; R. COOTER and T. ULEN, *Law and Economics, 6th edition*, Boston, Pearson, 2016, 49; M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial

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premiums and offer conditions that are as close as possible to the actual risk.[41] AI has the potential to limit subsidising solidarity and could help to obtain true chance solidarity in some cases. These prospects strongly contrast with traditional insurance methods, which can only occasion subsidising solidarity. After all, the traditional method's narrow scope is unable to identify all risk factors.[42] Through AI subsidising solidarity could be limited and it could theoretically become possible to achieve true chance solidarity in some cases.[43]

8. Harnessing AI allows insurers to differentiate themselves from their competitors *(iv)*. The (informational) advantage enables the development of more sophisticated risk models. Building on these models insurers may offer more competitive rates, allowing them to attract smaller risks as these risks may be covered by an insurance contract at a lower premium.[44] Risk model sophistication allows insurers to focus predominantly on positive risks and, consequently, to reduce claim pay-outs, but also to charge higher premiums to those policyholders who show a higher risk. In addition, insurers using AI applications could lower their operational and administrative costs by realising efficiency gains (e.g. by eliminating the need of analysing the information provided by the policyholder, i.e. the spontaneous information disclosure).[45]

9. AI also allows insurers to advise policyholders more accurately on the precautionary measures they can take to prevent risks from occurring or to minimise their effects *(v)*.[46] For example, in the context of vehicle liability insurance, AI-based telematics can motivate policyholders to modify their driving behaviour to receive premium refunds.[47] Telematics can also display important relevance in fire insurances. Smart home devices, such as HIVE (a home security product) and NEST (a thermostat), could inform insurance companies. These digitally controlled products, which monitor, among other things, the security and the energy consumption of the policyholder's home, could also enable insurers to intervene when risks

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intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 14.

[41] J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 418.

[42] K. S. ABRAHAM, "Efficiency and Fairness in Insurance Risk Classification", *Virginia Law Review* 1985, Vol. 71, Issue 3, 409; W.P.J. WILS, "Insurance Risk Classifications in the EC: Regulatory Outlook", *Oxford Journal of Legal Studies* 1994, Vol. 14, Issue 3, 454.

[43] G. W. DE WIT and J. VAN EEGHEN, "Rate making society's sense of fairness", *Astin Bulletin* 1984, Vol. 2, 156.

[44] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 122.

[45] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 99; THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 14.

[46] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 100; THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 8; INSURANCE EUROPE, *QAs on the use of big data in insurance*, January 2019, www.insuranceeurope.eu, 2; M. ELING, D. NUESSLE and J. STAUBLI, "The impact of artificial intelligence along the insurance value chain and on the insurability of risks", *The Geneva Papers on Risk and Insurance - Issues and Practice* 2021, 19 and 21.

[47] J. AMANKWAH, "Nieuwe technologische ontwikkelingen in verzekeringen", in C. VAN SCHOUBROECK and I. SAMOY (eds.), *Themis 106 - Aansprakelijkheids-en verzekeringsrecht*, Brugge, die Keure / la Charte, 2018, 77-78 and 81-82; BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 118-119; INSURANCE EUROPE, *QAs on the use of big data in insurance*, 23 January 2019, www.insuranceeurope.eu, 2-3; EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 34.

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occur. For example, by giving insurers access to these devices, they can be notified in real-time if a water leak occurs and even shut off the water supply if the policyholder fails to respond.[48]

2. Challenges

10. Although the implementation of AI and big data benefits insurers, pervasive segmentation through AI also has downsides. The benefit of detailed assessments of risks can be subverted by the *de facto* uninsurability (i.e. the financial impossibility to cover the risks) of certain policyholders. After all, excess in segmentation may create several small segmentation groups of (very) high-risk policyholders who, due to a substantial increase in the premium, are unable to pay the premium, and, consequently, cannot get insurance coverage.[49] The Belgian Insurance Law, however, somewhat mitigates this downside by establishing so-called 'pricing agencies ('*Tariferingsbureaus*')' for the most important (compulsory) and most common insurances, such as vehicle liability insurance ('*Tariferingsbureau BA'*). These pricing agencies insure those who cannot obtain coverage from commercial insurance companies. In this respect, individuals who cannot afford insurance or individuals who represent a risk that commercial insurers are unwilling to underwrite, are not excluded from being insured.

11. AI-based segmentation could also occasion (increased[50]) opacity regarding policy conditions and criteria. Thorough segmentation inevitably leads to risk differentiation and individualisation of policy conditions. This customisation of policy conditions complicates the comparison of services/coverage and corresponding prices, and potentially disables the policyholders to identify the best offer in the market. Although increasingly sophisticated comparison tools somewhat mitigate this obstruction, these will only be useful if insurers are open about the criteria they use.[51] The Belgian Insurance Law requires insurers to publish the segmentation criteria they use in terms of underwriting, pricing, and/or scope of the coverage on their website, and to explain why these criteria are used. However, this disclosure does not obligate insurers to explain exactly how the employed AI model works and to what extent the various criteria influence the final decision (*see infra* no. 15).[52]

In addition, the insurers' freedom to adjust their segmentation policy and their segmentation criteria throughout the life of the contract, adds to the discussed opacity and contributes to

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[48] THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 8; OECD, *The Impact of Big Data and Artificial Intelligence (AI) in the Insurance Sector*, 2020, www.oecd.org, 13.

[49] BAFIN, *Big data meets artificial intelligence Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 126; THE GENEVA ASSOCIATION, *Insurance in the Digital Age A view on key implications for the economy and society*, September 2018, www.genevaassociation.org, 15; OECD, *The Impact of Big Data and Artificial Intelligence (AI) in the Insurance Sector*, 2020, www.oecd.org, 6-7; J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 420; BEUC, *The use of big data and artificial intelligence in insurance*, 19 May 2020, www.beuc.eu, 8-9; C.P. HOLLAND, M. MULLINS and M. CUNNEEN, "Creating Ethics Guidelines for Artificial Intelligence (AI) and Big Data Analytics: The Case of the European Consumer Insurance Market", *Patterns* 2021, Vol. 2, Issue 10, 6.

[50] Without the use of AI, the varied prices and exclusions included in each contract make it difficult for policyholders to accurately compare insurance proposals.

[51] BAFIN, *Big data meets artificial intelligence: Challenges and implications for the supervision and regulation of financial services*, July 2018, www.bafin.de, 99.

[52] N. DE PRIL and J. DHAENE, *Rapport van de werkgroep Segmentering*, September 1995, https://feb.kuleuven.be, 19-21.

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uncertainty as well. After all, policyholders who represent a small risk will never be sure they will maintain this position long-term.[53] Transparency, therefore, is crucial.

The importance of disclosure regarding segmentation processes should, however, not be overstated. After all, transparency is a double-edged sword. Whereas openness about segmentation has the potential to reduce opacity and uncertainty, it could equally lead to data manipulation.[54] The ability to identify the deployed segmentation criteria allows policyholders not only to adjust their behaviour but also to conceal jeopardising conduct to obtain a more favourable risk estimation. To avoid distortion, legislators could ban malleable data from being used in segmentation policies.[55]

12. AI may encourage insurers to utilise criteria that do not show a direct link to the insurance risk in order to determine the premium and conditions. AI could enable price optimization practices, such as 'behavioural pricing', *i.e.* determining premiums and conditions of an insurance product based on policyholders' (online) behaviour[56].[57] Based on this online behaviour, data insurers could determine which customers would be more inclined to switch after the renewal date of their policy.[58] Based on their loyalty and willingness to pay, the price for coverage is thus calculated individually. The insurer could lower its prices at renewal for the policyholders that are more price sensitive, and increase its prices at renewal for policyholders who are less likely to switch. Policyholders who are less inclined to switch and will renew their insurance products rather than look for an alternative, could be subjected to a 'loyalty penalty'.[59] When using behavioural pricing, the value of (part of) the premium is completely independent of the individual insurer's risk profile and the costs associated with the insurance product. This situation involves price discrimination.

However, price discrimination could be problematic for policyholders who find themselves in a weaker position, such as policyholders with a low income or with a low level of education, or elderly policyholders, who do not have the resources or expertise to search and switch to a cheaper provider.[60] In addition, policyholders often do not know how their information is used in calculating the premium, so they are often unaware of whether price discrimination has

[53] J. AMANKWAH, "Chapter 15. Insurance Underwriting on the Basis of Telematics: Segmentation and Profiling", in J. DE BRUYNE and C. VANLEENHOVE (eds.), *Artificial Intelligence and the Law*, Mortsel, Intersentia, 2021, 421.

[54] Mainly social data could easily be manipulated by, for example, creating a fake Facebook or Instagram account or posting messages that are not based on reality. Such data manipulation could result in fraud committed by the policyholder, which may be more difficult to detect compared to fraud (currently) committed through insurance proposals.

[55] This will, however, have some societal impact, as this is how legislators determine which behaviour the policyholder can or cannot adapt.

[56] Even though technically this practice bears no relation to the segmentation technique, it is still important to address this practice and the legislator cannot ignore this issue.

[57] EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 39.

[58] AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 15.

[59] AFM, *The personalisation of prices and conditions in the insurance sector: an exploratory study*, June 2021, www.afm.nl, 15; EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 39.

[60] EIOPA, *Big data analytics in motor and health insurance: a thematic review*, 2019, https://register.eiopa.europa.eu/, 39 and 47.

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occurred.[61] Unfortunately, current transparency requirements are not sufficient to address this problem. The Belgian Insurance Act only requires an explanation of the segmentation criteria used by the insurer[62] but does not compel the insurer to be transparent about the criteria that are independent of the segmentation technique[63]. The transparency requirement imposed by the Unfair Commercial Practices Directive is also inadequate, as it only requires insurers to provide information regarding the final price (the premium), without disclosing information about the (non-segmentation) criteria that led to this price.[64] In other words, it could be desirable that the legislator creates an additional transparency requirement which requires insurers to explain to policyholders how and why they use the criteria. However, there is currently no conclusive evidence that proves that information regarding behavioural pricing can change a policyholder's behaviour, or will fully protect them from paying a higher price, as information disclosure only has a limited effect on a policyholders' ability to recognise and understand individual price optimisation based on online behaviour.[65,66]

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[61] EUROPESE COMMISSIE, *Consumer market study on online market segmentation through personalised pricing/offers in the European Union (Request for Specific Services 2016 85 02 for the implementation of Framework Contract EAHC/2013/CP/04), Final report*, June 2018, 118; FCA, *General insurance pricing practices: Interim Report, Market Study (MS18/1.2)*, October 2019, www.fca.org.uk, 23.

[62] See Article 45, §1 of the Insurance Act.

[63] The used criteria for price optimization cannot be considered segmentation criteria as these criteria have nothing to do with risk represented by the policyholder and show no relation to the claim probability. However, it is also possible that a criterion could be simultaneously related to the claims probability of a policyholder as to his price sensitivity.

[64] Article 6 and 7 of this Directive only requires the insurer to provide information regarding the price *or* the manner in which the price is calculated: '*the price* ***or*** *the manner in which the price is calculated* (Article 6, 1., (d)) and '*the price (…),* ***or*** *where the nature of the product means that the price cannot reasonably be calculated in advance, the manner in which the price is calculated* (Article 7, 4., (c)' (own emphasis)).

[65] EUROPESE COMMISSIE, *Consumer market study on online market segmentation through personalised pricing/offers in the European Union (Request for Specific Services 2016 85 02 for the implementation of Framework Contract EAHC/2013/CP/04), Final report*, June 2018, 104, 167-168 and 247; OECD, *The effects of online disclosure about personalised pricing on consumers results from a lab experiment in Ireland and Chile, OECD Digital Economy Papers, nr. 303*, January 2021, www.oecd-ilibrary.org, 27-28.

[66] So merely being transparent to the policyholder is not sufficient, and legislators could consider imposing an absolute ban on using unfair, non-risk-based criteria to calculate the premiums and conditions of an insurance contract (for example, in the United Kingdom and the United States: *see* FCA, *FCA confirms measures to protect customers from the loyalty penalty in home and motor insurance markets, Press Release*, 28 May 2021; and CFA, *Protection Against Unfair and Excessive Rates Removed by Actuarial Group Despite Unanimous Request by Regulatory Actuaries, CAS Refuses to Undo Action*, 29 March 2021, 2). The question arises if the legislator is allowed to just intervene and restrict the freedom of insurers to set rates. Solvency II Directive states that Member States must ensure that the insurance products offered can be marketed in their territory without any obstacles and prohibits them from requiring prior approval or systematic notification of tariffs. This means that insurers are not required to seek prior authorisation for their premiums and can bring their (new) insurance terms to the insurance market without prior supervision. However, not all provisions involving restrictions on insurance prices will be impermissible. A provision that does not result in the direct setting of premium rates by the State which allows insurers still to be free to set the amount of the basic premium, will not be in breach of the freedom to set rates. That being said, such restrictions do still interfere with the freedom to provide services and the freedom of establishment and must be justified. A restriction may be justified where it serves overriding requirements relating to the public interest, is suitable for securing the attainment of the objective which it pursues, and does not go beyond what is necessary to attain it (*see* CJEU 28 April 2009, C-518/06, *Commission of the European Communities v. Italian Republic*, ECLI:EU:C:2009:270, para. 72). If the legislator stipulates that the insurer may not increase its prices when policyholders are price-insensitive, the insurer still retains its freedom to determine the basic premium. However, this does constitute a restriction on the abovementioned freedoms, and thus must be justified. It could be argued that such a rule serves the public interest (i.e. consumer protection and, more specifically, protecting consumers from unfair price increases) and can achieve this objective. It also seems proportionate and does not go beyond what is necessary.

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13. AI analytics intensify concerns that insurers will identify risks that have no causal relationship whatsoever to the insured loss. AI applications can find subtle correlations previously undetected by traditional statistics, which could lead to identifying segmentation criteria that merely correlate with the risk, without (proven) any causal link[67].[68] AI could identify spurious correlations (i.e. two random variables appear causally related to one another but are not, due to either coincidence or the presence of a certain third, unseen factor)[69].[70] This means it could be important for the legislator to create an obligation that requires the insurer to only use segmentation criteria that show a causal relationship (if possible[71]), or at least an increased correlative relationship with the claims probability (for more information, see, *infra*, no. 16).

C. Restrictions on AI segmentation imposed by the Belgian Insurance Act

14. The question arises whether the insurer can simply use AI to analyse big data and an infinite number of parameters in order to individualise risks. Each insurer is free to contract with whomever on the terms and the price it wants.[72] In theory, based on the freedom of will, the insurer is thus free to pursue its own segmentation policy. This freedom ensures that the insurer can employ an unlimited amount of parameters. The number and nature of segmentation criteria used vary considerably in the insurance market. Therefore, some insurers may include only three segmentation criteria and others may use 300 different criteria.[73] As a consequence, the same person would have to pay a higher premium for insurer X than for insurer Y, if the latter, for example, omitted a certain parameter (affecting this person) that made the policyholder appear to carry a lower risk. In addition, this freedom has led to an open and highly competitive insurance market in which insurers, in pursuit of

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[67] Correlation refers to two variables being statistically related in some way. Correlations do not explain whether a cause-effect relationship exists between two variables and if one variable influences change in the other variable. Variables A and B could for example occur simultaneously, however, it can be unclear whether and why A causes B. For example, an AI system might identify that policyholders who buy vampire novels on Amazon, like vampire-related media on Facebook, or follow authors of vampire fiction on Twitter are more likely to behave in a riskier manner. However, it is possible that a causal link cannot be found between being a fan of vampire fiction and claims probability, or that an insurer, due to the complex and opaque nature of an AI system, cannot prove this causal link.

[68] R. SWEDLOFF, "Risk Classification's Big Data (R)evolution", *Connecticut Insurance Law Journal* 2014, Vol. 21, Issue 1, 366-367.

[69] For example, there might exist a correlation between sunburn rates and ice cream sales. However, these two variables do not impact each other, but are influenced by a third variable (so-called 'confounding variable'), i.e. the temperature.

[70] *See* www.scribbr.com/methodology/confounding-variables/ and www.tylervigen.com/spurious-correlations for some examples.

[71] Issues regarding machines' lack of understanding of causal relations were raised by J. PEARL, in "The Book of Why: The New Science of Cause and Effect". However, nowadays there has been (preliminary) research regarding so-called 'causal AI', stating that causal AI, a powerful underlying algorithm that can explain cause and effect, may offer new opportunities to test causality and to reveal the causal patterns in large data sets faster and more efficiently, along with the ability to unravel the underlying complexity. The causal AI research area is still early in its development. *See* S. K. SGAIER, V. HUANG and CH. GRACE, "The Case for Causal AI", *Stanford Social Innovation Review* 2020, Vol. 18, Issue 3, 50-55; E. KICIMAN, E. DILLON, D. EDGE, A. FOSTER, A. HILMKIL, J. JENNINGS, CH. MA, R. OSAZUWA NESS, N. PAWLOWSKI, A. SHARMA and CH. ZHANG, "A Causal AI Suite for Decision-Making", *NeurIPS 2022 Workshop on Causality for Real-world Impact* 2022, 1-10; B. KOMMADI, *Casual AI*, https://swisscognitive.ch/2022/01/18/casual-ai/.

[72] T. VANSWEEVELT and B. WEYTS, *Handboek Verbintenissenrecht*, Mortsel, Intersentia, 2019, 129; A. J. HERAS, P.-CH. PRADIER and D. TEIRA, "What was fair in actuarial fairness?", *History of the Human Sciences* 2019, Vol. 33, Issue 2, 91.

[73] G. WERNER, C. MODLIN and W. TOWERS, "Basic ratemaking", *Casualty Actuarial Society* 2016, 15.

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profitability, have started to apply more sophisticated segmentation.[74] Given this freedom, in principle, the insurer cannot be held responsible for (not) having taken a certain parameter into account. That being said, some existing legal restrictions may still limit this freedom.

1. Direct restrictions: the prohibition of the use of certain segmentation criteria

a) Discrimination

15. In addition to the Belgian anti-discrimination laws[75], the Insurance Act contains some antidiscrimination rules for (most[76]) insurers. Article 44 of the Insurance Act imposes that any distinction must be objectively justifiable by a legitimate purpose, which means that any differentiation requires a well-founded, fair justification[77]. The anti-discrimination laws apply to all industries and define a few protected criteria which have to be justified if used. However, based on the obligation in the Insurance Act insurers must be able to justify *each* segmentation criterion, not merely the protected criteria listed by the anti-discrimination laws. Moreover, the insurer must publish the segmentation criteria it uses for each type of insurance contract on its website and in the proposal to the policyholder, and provide guidance on the used segmentation criteria.[78] If the insurer decides not to cover a risk, it must communicate this to the policyholder. In this written communication, the insurer has to mention the data it has processed and the segmentation criteria that have led to the decision in particular.[79] Meeting these requirements is made significantly more onerous, as the use of an AI system requires the insurer to objectively justify a greater number of criteria and explain them to the insurer. In addition, AI models may select and apply criteria on their own, without the insurer having any insight or control over it.[80]

If the insurer is guilty of using discriminating segmentation criteria, Article 22 of the Insurance Act comes into effect, which requires the criteria that lead to discrimination to be retroactively removed from the segmentation policy. This may result in an adjustment of the policyholder's insurance contract, meaning that some policyholders will have to pay a higher premium, or be subject to stricter conditions (and possibly have to terminate their contract when it becomes

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[74] N. DE PRIL and J. DHAENE, *Rapport van de werkgroep Segmentering*, September 1995, https://feb.kuleuven.be, 30.

[75] The Antidiscrimination Act (Wet van 10 mei 2007 ter bestrijding van bepaalde vormen van discriminatie (*BS* 30 mei 2007), the Gender Act (Wet van 10 mei 2007 ter bestrijding van discriminatie tussen vrouwen en mannen (*BS* 30 mei 2007) and the Antiracisme Act (Wet 10 mei 2007 tot wijziging van de wet van 30 juli 1981 tot bestraffing van bepaalde door racisme of xenofobie ingegeven daden (*BS* 30 mei 2007).

[76] *See* Article 43, §§1-2 of the Insurance Act.

[77] Y. THIERY and C. VAN SCHOUBROECK, "Fairness and Equality in Insurance Classification", *The Geneva Papers on Risk and Insurance – Issues and Practice* 2006, Vol. 31, 19.

[78] Art. 45, §1 of the Insurance Act and art. 46, §1, the first paragraph of the Insurance Act.

[79] Art. 46, §4, the first and second paragraph of the Insurance Act.

[80] This could lead to a situation where insurers cannot simply use AI applications to calculate policyholders' claims probability, which could help to prevent the creation of discriminatory decisions. Nevertheless, Explainable AI ('XAI)' could lend a hand, as it makes it possible to provide an explanation on the used variables, and why they can predict the risk. For more information regarding XAI models, *see* A. ADADI and M. BERRADA, "Peeking Inside the Black-Box: A Survey on Explainable Artificial Intelligence (XAI)", *IEEE* 2018, Vol. 6, 52138-52160; R GUIDOTTI, A. MONREALE, S. RUGGIERI, F. TURINI, F. GIANNOTTI and D. PEDRESCHI, "A survey of methods for explaining black box models", *ACM Computer Surveys* 2018, Vol. 51, Issue 5, 93:1-42.; M. BRKAN and G. BONNET, "Legal and Technical Feasibility of the GDPR's Quest for Explanation of Algorithmic Decisions: of Black Boxes, White Boxes and Fata Morganas", *European Journal of Risk Regulation* 2020, Vol. 11, Issue 1, 18-50; B. MITTELSTADT, C. RUSSEL and S. WACHTER, "Explaining Explanations in AI", *FAT* '19: Proceedings of the Conference on Fairness, Accountability, and Transparency* 2019, 279-288.; R. MATULIONYTE, "Reconciling Trade Secrets and AI Explainability: Face Recognition Technologies as a Case Study", *European Intellectual Property Review* 2022, Vol. 44, Issue 1, 36-42.

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unaffordable for them). However, this sanction can never work to the detriment of the person protected by it, as this would be contrary to the purpose of the legal provision in question. Therefore, this sanction cannot be applied.

16. This anti-discrimination obligation in the Insurance Act is insufficient to fully ban discriminatory decisions made by an AI system. *First*, current obligations do not guarantee an adequately clear explanation or justification of the outcomes generated by an AI application. As elaborated above, the legislator does not oblige the insurer to indicate to what extent the various criteria are considered and how they are used in calculating risk. The legislator also fails to specify how detailed the different criteria should be defined. Consequently, insurers could choose to describe them in more general overarching terms, which can still cover several (possibly prohibited) criteria[81].[82] In addition, the requirement to explain why the relevant criteria are used, is very vague and could be easily met by simply stating that an AI system has demonstrated certain correlations. *Second*, it is still possible that insurers can justify the criteria they employ by demonstrating their effect on the outcome, but at the same time still engage in (indirect) discriminatory decision-making. For example, if the insurer can prove that a policyholder's postal code is correlated to the degree of risk of a car accident, this criterion could still lead to a discriminatory policy, as this factor could discriminate against a particular ethnicity that is overrepresented in this location. *Third*, the policyholder must detect and prove that the insurer uses discriminatory segmentation criteria[83], which is not an easy task given the use of AI. The specific characteristics of AI systems, such as opacity, autonomous behaviour, adaptivity, and complexity, may make it excessively difficult, if not impossible, for the policyholder to meet this burden of proof. Also, based on the current transparency requirement, the policyholder has no clear view on all the (specific) criteria used in the segmentation policy, and the extent to which they play a role in determining the policy. Moreover, the insurer can easily justify the use of the criteria just by arguing that the likelihood and extent of a claim vary as these criteria change. *Fourth*, the current provisions in the Insurance Act do not resolve the issues related to the above-mentioned price discrimination, because the insurer is not obligated to objectively justify other criteria which are unrelated to the segmentation, but which do influence the price. *Fifth*, AI applications could lead to the identification of criteria that are purely correlated with the risk to be insured, without any causal relationship (*e.g.* spurious correlations)[84]. The legislator could choose to create a

[81] For example, insurers could list 'financial transactions' as a segmentation criterion, without specifying exactly which transactions are involved, and exactly which ones show a correlation to the claims probability, and why.

[82] However, this problem could be partially remedied by the transparency obligation in the GDPR. Based on the GDPR data controllers (insurers) must inform data subjects (policyholders) that their data is being processed through an AI system, as well as provide meaningful information about the logic involved, the significance and the envisaged consequences of such processing for the data subject (Article 13, 2., f) GDPR and Article 14, 2., g) GDPR). Based on this provision, policyholders at least be provided with information on the fact that they will be profiled, on the preferred approach and technology, on the main (categories of) input variables, and on the reasons why the profile is relevant to the decision-making process. In addition, this provision can require insurers to outline the weighting of the used (categories of) variables. *See* EPRS, *The impact of the General Data Protection Regulation (GDPR) on artificial intelligence*, June 2020, www.europarl.europa.eu, 64.

[83] This is a fault-based liability rule, which require the person to prove a negligent or intentionally damaging act or omission ('fault') by the person potentially liable for that damage, as well as a causal link between that fault and the relevant damage.

[84] R. SWEDLOFF, "Risk Classification's Big Data (R)evolution", *Connecticut Insurance Law Journal* 2014, Vol. 21, Issue 1, 366-367; FSB, *Artificial intelligence and machine learning in financial services. Market developments and financial stability implications*, 1 November 2017, www.fsb.org, 6.

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requirement that the insurer may only use segmentation criteria that show, a causal relationship or at least an increased correlation with the probability of the claim. However, the current obligation to objectively justify all segmentation criteria does not mean the insurer needs to demonstrate a causal link. After all, if we look at the pertinence criterion, presupposed in the Belgian general anti-discrimination laws, it is merely required that the measure has an impact that aggravates the nature of the risk.[85]

b) Genetic information

17. The Insurance Act contains an exception to the abovementioned spontaneous disclosure obligation of the policyholder: the policyholder cannot disclose genetic data to the insurer, even if it benefits him.[86] Also, under no circumstances may the insurer request and process such information[87].[88] Again, AI could play a difficult role here. Even if the policyholder does not disclose his genetic data to the insurer, AI could still take genetic data into consideration by using proxies correlating with the policyholder's genetic profile. Merely denying AI model data or characteristics that have a direct link to genetic information, does not necessarily prevent AI algorithms from determining the risks based on genetic predisposition. An AI system may look for other – seemingly neutral – variables that proxy for genetic information.[89] Suppose the AI system estimates a higher risk for policyholders who are members of a Facebook group dedicated to increasing the availability of genetic testing for Parkinson's, the insurer could discriminate by proxy as members of this Facebook group could be more likely to have a form of Parkinson's in their family.[90]

The Belgian legislator has failed to define the concept of 'genetic data', leaving its precise scope uncertain, which creates ambiguity and legal uncertainty, all the more now as AI becomes more prominent. It is up to the legislator to clearly delineate these concepts, and more specifically to include the obvious proxies or substitutes for prohibited characteristics. It is advisable to provide a broad interpretation, in order to avoid erosion of the absolute prohibition on the collection and use of genetic data.[91] An adequate solution could be to define genetic information as 'data relating to genetic characteristics', a similar description to the one included in the GDPR[92], which would also prohibit the use of proxies.

18. The breach of the prohibition on communicating and processing genetic information is sanctioned with relative nullity, instead of legal conversion.[93] When the premium and other policy conditions have been determined based on genetic information, they will be nullified.

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[85] Y. THIERY, *Discriminatie en verzekering: Economische efficiëntie en actuariële fairness getoetst aan het juridisch gelijkheidsbeginsel, Proefschrift KU Leuven,* 2010, 198-199.

[86] Article 58(1) and (2) of the Insurance Act.

[87] Unlike the non-discrimination provision, the use of genetic factors is *absolutely* prohibited, as the insurer cannot use any genetic information even if it can objectively justify it.

[88] E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 65.

[89] A. E.R. PRINCE and D. SCHWARCZ, "Proxy Discrimination in the Age of Artificial Intelligence and Big Data", *Iowa Law Review* 2020, Vol. 105, 1303.

[90] A. E.R. PRINCE and D. SCHWARCZ, "Proxy Discrimination in the Age of Artificial Intelligence and Big Data", *Iowa Law Review* 2020, Vol. 105, 1261.

[91] S. DEFLOOR, *Het gebruik van medische informatie in private verzekeringen*, Mortsel, Intersentia, 2014, 200; E. GOESSENS, *Private verzekering en solidariteit*, Mortsel, Intersentia, 2018, 129.

[92] See Article 4, 13 GDPR: "'genetic data' means personal data *relating* to the inherited or acquired genetic characteristics of a natural person which give unique information about the physiology or the health of that natural person and which result, in particular, from an analysis of a biological sample from the natural person in question".

[93] Art. 56 of the Insurance Act.

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Although the ground for nullity only applies to part of the contract (i.e. partial nullity), the entire contract will have to be declared null and void, as these conditions are essential to its continued existence.[94] Apart from the fact that the burden of proof once rests on the policyholder again, this sanction does not protect the policyholder at all, as the nullity sanction has the effect of retroactively depriving him of coverage. Again, this sanction cannot be applied when it is to the detriment of the person protected by it. In light of this, the legislator should consider adapting this sanction in order to create other consequences that are in the interest of the injured policyholder.

c) Information from health trackers

19. The Belgian legislator has actively intervened in the use of technology within the health insurance sector. By using certain applications and wearables, such as *Fitbit* or *Runkeeper*, health data is captured, such as the number of steps, sleep habits, average heart rate, and so on. The insurer could use this data to estimate the risk of the insured event and further individualise the premium. However, according to Article 46/2 of the Insurance Act, it is prohibited to refuse individual life insurance or health insurance[95], or to charge a higher price, if the prospective policyholder refuses to purchase or use such Internet-connected devices. In other words, the policyholder should not be penalised if he refuses to use a connected device.[96] In addition, it is prohibited to use this data for segmentation, even if the policyholder agrees to use an internet-connected device or shares the information collected by this device.[97] As a result, prospective policyholders with a lower health risk demonstrated by such devices cannot obtain a lower premium or better conditions, and prospective policyholders with a higher health risk cannot be charged a higher premium or be excluded from coverage.

Unlike the ban on using genetic information, proxies do seem to be allowed here, enabling insurers to look at, for example, purchasing sports equipment or healthy food, or posting a completed run (tracked by Strava) on Facebook or Instagram, to check how healthy policyholders really are.

20. If the insurer were still to use health data from Internet-connected devices to estimate the risk and calculate the policy, the legal conversion would come into effect again[98], requiring the policy provisions based on these criteria to be retroactively removed from the segmentation policy, which could again result in an adjustment of the policyholder's policy.

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[94] F. PEERAER, "Nietigheid op maat: proportionaliteit en werkzaamheid bij partiële nietigheid, reductie en conversie", *TPR* 2016, Issue 1, 187. For a more detailed explanation, *see also* T. TANGHE, *Gedeeltelijke ontbinding en vernietiging van overeenkomsten*, Mortsel, Intersentia, 2015, 149-276.

[95] Art. 46/1 of the Insurance Act.

[96] Art. 46/2 of the Insurance Act. This article is in tune with what the GDPR stipulates. This regulation states that any consent must (among other things) be 'free'. This means that the prospective policyholder should be at risk that the services he has requested will not be provided if he does not give his consent for his data to be processed for reasons other than those necessary to perform the contract. In this case, the legislator itself has decided that the personal data collected by health trackers are not necessary to assess the risk and calculate the premium and conditions of the insurance policy. For more information, *see* J. GOETGHEBUER, "De invloed van artikel 22 AVG op het gebruik van robo-advies binnen de beleggingssector. Met de rug tegen de muur?", *RDC-TBH* 2020, Issue 2, 156.

[97] Art. 46/3 of the Insurance Act.

[98] And not relative nullity, like when there is a breach of the prohibition on communicating and processing genetic information, as it is not included in Part 4 of the Insurance Act.

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d) Gender as a criterion

21. The European Court of Justice has prohibited gender as a differentiation criterion for calculating insurance premiums and benefits, even if the differences would be based on reliable actuarial statistical data and could be objectively justified.[99,100] However, it is still possible to make an *indirect* distinction based on gender if the aim of the unequal treatment is legitimate and the means of achieving that aim are appropriate and necessary (see the general anti-discrimination law). The application of factors correlated with gender thus remains possible. For example, application forms can include different questions for each gender.[101]. In addition, when it comes to vehicle insurance, price differentiation based on the size of a car engine should for instance remain possible, even though statistically men drive cars with greater engine power[102].[103]

AI can create greater indirect discrimination based on gender through the use of proxies. Friend lists on Facebook, shopping habits on Amazon or bol.com, and search history on Google could easily translate into a high probability of an individual's gender. When data on shopping habits are fed to the AI system, it can easily learn to group individuals into categories labelled A and B. These categories can fairly accurately correspond to one's gender, although the system may be programmed to disregard direct data on gender.[104] However, even keeping this prohibition in mind, it is permissible to use proxies for gender and indirectly make a distinction, although the general discrimination laws require to justify this distinction on legitimate grounds. If this indirect discrimination is not justified, the sanctions applicable to the Belgian general anti-discrimination obligations will apply. After all, the case law of the Court of Justice in Belgium was transposed into the Gender Act of 10 May 2007. When a person considers himself a victim of discrimination and can present facts that suggest the existence of discrimination, the defendant has to prove that there has been no discrimination. The Belgian

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[99] CJEU 1 March 2011, C-236/09, *Association belge des Consommateurs Test-Achats ASBL, Yann van Vugt, Charles Basselier v. Conseil des ministres*, ECLI:EU:C:2011:100.

[100] The use of gender as a risk-determining factor is not generally prohibited. Since the prohibition refers only to the calculation of premiums and benefits, the insurer can gender as a factor in calculating the risk policyholders could represent, and use it to determine whether or not to underwrite the risk, as the underwriting process is separate from the base price of an insurance product profile. See EUROPEAN COMMISSION, *Guidelines on the application of Council Directive 2004/113/EC to insurance, in the light of the judgment of the Court of Justice of the European Union in Case C-236/09 (Test-Achats*), *Pb.C.* 13 January 2012, 11, 10.

[101] EUROPEAN COMMISSION, *Guidelines on the application of Council Directive 2004/113/EC to insurance, in the light of the judgment of the Court of Justice of the European Union in Case C-236/09 (Test-Achats*), *Pb.C.* 13 January 2012, 11, 4 and 10.

[102] For instance, a woman whose family has a history of breast cancer will generally have to pay a higher risk premium than a woman without such a family history. However, there is no reason for a man with the same family history to pay a higher premium, since the probability that he will suffer from breast cancer is extremely low. In other words, this distinction is justified and non-discriminatory [*see* EUROPEAN COMMISSION, *Guidelines on the application of Council Directive 2004/113/EC to insurance, in the light of the judgment of the Court of Justice of the European Union in Case C-236/09 (Test-Achats*), *Pb.C.* 13 January 2012, 11, 10]. It is important to stress that this example is used purely to clarify the meaning of an indirect distinction as in Belgium it is forbidden to request and process such genetic information, as described above.

[103] EUROPEAN COMMISSION, *Guidelines on the application of Council Directive 2004/113/EC to insurance, in the light of the judgment of the Court of Justice of the European Union in Case C-236/09 (Test-Achats*), *Pb.C.* 13 January 2012, 11, 4.

[104] A. TISCHBIREK, "Artificial Intelligence and Discrimination: Discriminating Against Discriminatory Systems", in T. WISCHMEYER and T. RADEMACHER (eds.), *Regulating Artificial Intelligence*, Cham, Springer Nature Switzerland, 2020, 107-108.

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legislator divided the burden of proof between the parties. However, again, it would be difficult for policyholders to discover a breach and provide the necessary facts.

2. Indirect restrictions

a) The equivalence requirement in the Belgian Insurance Act

22. Article 23, §1 of the Insurance Act states that contracts may not contain any clause that infringes the equivalence between the insurer's and the policyholder's commitments. The equivalence envisaged by this provision can refer both to a balance between the rights and obligations of the contracting parties (evaluation of the secondary obligations, i.e. a legal equivalence) and a balance between the main contractual performances (evaluation of the essential obligations, i.e. an economic equivalence). While there is still debate as to which equivalence is involved in this case (a legal or an economic one), it can be argued that this article refers to an economic equivalence when we look at the regulation regarding unfair terms used in a contract concluded with a consumer. The Directive on unfair terms states that a contractual term shall be regarded as unfair if, it causes a significant imbalance in the parties' rights and obligations arising under the contract, to the detriment of the consumer (i.e. a legal inequivalence). The directive stipulates further that unfair terms shall not be binding for the consumer and that the contract shall continue to bind the parties upon those terms if it is capable of continuing in existence without the unfair terms.[105] Consequently, national courts can only exclude the application of an unlawful contractual term and have no authorisation to revise its content and replace them with a default legal provision.[106] In other words, in case of insurance contracts concluded with consumers, the sanction of legal conversion *cannot* be applied when a manifest imbalance has been established between the rights and obligations of the contracting parties (thus: the legal equivalence). However, this is the very sanction applicable to a violation of Article 23, §1 of the Insurance Act. This sanction cannot take effect if legal inequivalence would be established. Besides, should one decide otherwise and argue that Article 22 of the Insurance Act refers to a legal equivalence, this provision would have no added value for consumers because the same obligation is already included in the unfair terms in the Belgian '*Wetboek Economisch Recht* (WER)', and in Article 5.52 of the New Civil Code.

23. An economic equivalence must be achieved between the insurer's services – the coverage –, and the premium to be paid by the policyholder. This means there will be economic inequivalence when the premium paid by the policyholder is too high (or too low) for the coverage provided by the insurer. Segmentation will not create such inequality, as segmentation is only used to determine the risk profile of the policyholder, and this risk profile will determine both the premium and the coverage (conditions). AI in this paper's context only determines segmentation, which means it will not impact the existence of an economic inequality.

To conclude that there is inequivalence, the court would have to look at what the insurer offers. This exercise requires comparing policyholders with the same risk profile. After all, besides the coverage, the premium is also influenced by the segmentation category of the

[105] Article 6, 1. of the Directive on unfair terms.

[106] CJEU 14 June 2012, C-618/10, *Banco Español de Crédito SA v. Joaquín Calderón Camino*, ECLI:EU:C:2012:349, para. 65-71.

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policyholder.[107] So, if it is not possible to make an abstraction of part of the premium affected by the risk represented by the policyholder and the part affected by the scope of coverage, one can only conclude to the existence of inequivalence if one can cluster the policyholders with the same risk profiles and compare their premiums with the acquired coverage. However, due to AI making these comparisons will no longer be a simple task, as AI systems will lead to the creation of small segmentation groups clustering a (very) limited number of policyholders with the same risk profile. This makes the determination of an inequivalence nearly impossible.

b) The rules of conduct in the Belgian Insurance Act

24. Under the overarching rule of conduct[108], insurers are obliged to act loyally, reasonably, and professionally in the interests of their policyholders when distributing insurance products.[109] All other, specific rules of conduct should always be read in light of this rule.[110] This implies that if the insurer complies with one of the specific rules without fulfilling this general duty of care, it still violates its legal obligations.[111]

When an insurer uses an AI system to determine the premium and terms of an insurance contract, this obligation still applies. The insurer must comply with this principle, both when developing the AI algorithms and when deploying them. Consequently, based on this duty of care, the insurer should not use an AI system if this system would make a worse decision on average than a reasonable natural person or a less complex algorithm. If, for example, the AI system miscalculates risk in an obvious way, resulting in either the underwriting, premium or coverage not being tailored to the real risk represented by the policyholder, the insurer has not behaved in a loyal, reasonable, and professional manner. Based on this obligation, the insurer could be expected to only use the (most appropriate) segmentation factors to accurately estimate the risk (e.g. the criteria showing a causal link or at least a strong correlation with the risk).

In order to hold the insurer liable, the policyholder cannot rely on a sanction contained in the Insurance Act. Therefore, he must rely on Article 1382 of the Belgian Old Civil Code, which requires the policyholder to prove that the premium or policy conditions were not adapted to the risk he represents in a manner that goes outside the boundaries of what is considered reasonable. Besides the fact that such misconduct is difficult for policyholders to detect, this may again be difficult to prove in the case of AI.

25. Prior to the conclusion of each insurance contract, the insurer needs to determine the customer's wants and needs using information provided by the policyholder, and must ensure

[107] E.g. if the insurer offers an annual premium of EUR 800 per year for policyholders with the same risk profile for vehicle liability insurance with the same exclusions, deductibles, and discounts, but another policyholder representing the same risk has to pay EUR 1,600 for the same coverage, the court could conclude inequivalence exists.

[108] The conduct of business measures contained in MiFID II also apply to the insurance sector.

[109] Art. 279, §1 of the Insurance Act.

[110] T. VANSWEEVELT and B. WEYTS, *Handboek Verzekeringsrecht*, Antwerpen, Intersentia, 2016, 137.

[111] FSMA, *Aanpassing van de circulaire FSMA_2014_02 d.d. 16/04/2014 met betrekking tot de wijziging van de wet van 27 maart 1995 en de uitbreiding van de MiFID-gedragsregels tot de verzekeringssector*, September 2015, www.fsma.be/, 21.

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that the insurance contract meets those wants and needs.[112] This obligation can also be described as the know your customer principle within the insurance sector[113], and is a concretisation of the general duty of care discussed above.[114] The preparatory works show that this special rule of conduct serves the following purposes: (*i*) avoiding that the policyholder is covered multiple times for the same risks (problem of multiple coverage), *(ii)* avoiding underinsurance (in other words avoiding that the subject is covered for too low a value), *(iii)* avoiding over-insurance (in other words avoiding that the subject is covered for too high a value) and (*iv*) avoiding a wrong coverage (in other words avoiding that certain risks are not covered although this is the customer's wish or, conversely, avoiding that certain risks are covered although the customer does not wish this to be the case).[115]

The purpose of this legal obligation is to ensure that the coverage requested matches the coverage obtained. However, AI segmentation will have no influence in determining multiple or wrong coverage. After all, insurers' websites usually contain general terms and conditions defining the positive coverage as well as the exclusions for all (high-risk or low-risk) policyholders. It is mainly the extent of coverage (such as limits and exemptions) that will be determined by the risk represented by the policyholder, so AI will only play a role in this case. That being said, this legal provision does not oblige the insurer to ensure that the extent of coverage is adjusted to the risk represented by the policyholders, as it merely seeks to avoid the situations of over- and underinsurance. AI could still lead to situations of underinsurance and over-insurance, as AI could create a miscalculated insured value. However, since the calculation of insured value does not rely on (AI) segmentation, this issue will not be discussed any further.

III. Conclusion

26. Insurance is based on the segmentation technique, making it possible for insurers to assess the risks represented by (prospective) policyholders, and establishing a risk profile for each policyholder. Segmentation can be used by the insurer to differentiate the terms of an insurance contract according to some specific characteristics of the risk ('segmentation criteria'). This means segmentation only plays a role in determining whether to underwrite this insurance risk and if so, on what terms (i.e. the coverage, scope and premium of an insurance contract).

The current Belgian Insurance Act allows insurers to use AI as a tool for the segmentation technique, as in general, each insurer is free to pursue its own segmentation policy. Given this freedom, *in principle*, the insurer cannot be held responsible for (not) taking a certain parameter into account. That being said, some legal restrictions still exist that could limit this freedom. The question arises if these restrictions can protect the policyholder from erroneous decisions made by an AI system. After all, even if the sheer amount of new data available combined with AI could lead to accurately predicting the individual risk of policyholders, we must not forget that this new reality still leads to many challenges and ramifications for policyholders if their risk is incorrectly calculated. As the segmentation technique (traditionally) relies on the

[112] Art. 284, §1, paragraphs 1 and 2 of the Insurance Act.

[113] T. VANSWEEVELT and B. WEYTS, *Handboek Verzekeringsrecht*, Antwerpen, Intersentia, 2016, 157.

[114] B. BRUYNDONCKX and S. LODEWIJCKX, "Verzekeringsdistributie in een nieuw kleedje", *BFR* 2018, Issue 4, 258.

[115] Report to the King regarding the Royal Decree of 21 February 2014.

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spontaneous communication of information by the policyholder, the current Belgian insurance regulation is mainly aimed at protecting the insurer from obtaining inaccurate or incomplete information. Nevertheless, AI could lead to retrieving a larger amount of data regarding the policyholder, and the use of infinite segmentation criteria. AI segmentation could therefore solve the problem of information asymmetry between the policyholder and the insurer. The current Belgian Insurance Act is therefore not fully adapted to this new technological reality and currently contains few to no legal provisions that could protect policyholders from misjudging their risk and incorrect premiums and conditions.

First of all, the direct restrictions which prohibit the use of certain risk segmentation factors, do not fully protect policyholders against incorrect AI segmentation. Although the legislator applies concrete sanctions to these prohibitions in law, such as legal conversion and relative nullity, the burden of proof, which is usually[116] on the policyholder, prevents their actual application. Besides the fact that such misconduct is difficult for policyholders to detect, proving its existence will not be easy, given that the specific characteristics of AI systems may make it excessively difficult to meet the burden of proof. Furthermore, even if the policyholder is able to prove a breach, the applicable sanctions do not protect the policyholder. After all, the application of legal conversion can lead to the adjustment of an insurance contract, which may result in certain policyholders having to pay a higher premium or being subject to stricter conditions. Also, relative nullity does not protect the policyholder, as the nullity sanction has the effect of retroactively depriving him of coverage. More so, even if these restrictions are closely adhered to by the insurer, this still does not guarantee that the risk is assessed correctly and the premium and conditions correspond to reality.

Secondly, indirect restrictions do not constitute a sufficient protection mechanism either. Although the equivalence requirement, which creates a mandatory balance between coverage and premium, should provide better protection, in reality, this is not the case. Segmentation (based on AI) will not create an economic inequality as it will only determine the risk profile of the policyholder, and this risk profile will affect both premium and coverage, which means these two will always be coherent. Policyholders could invoke the general rule of conduct when they think the insurer has made an incorrect risk assessment. But again, the burden of proof of a breach lies with the policyholder.

27. Consequently, given the insurer's great freedom to use AI in its segmentation and the risks involved in doing so, the need for an additional regulatory framework is pressing. The legislator must introduce provisions that could ensure appropriate (AI) segmentation techniques, as a result of which the insurers' decisions on whether or not to underwrite the risk, as well as the insurance contract itself, are always adapted to the real risk represented by the policyholder.[117]

[116] With the exception of general anti-discrimination laws where there is a (too) limited presumption of discrimination.

[117] The proposals for the AI Act, AI Liability Directive and Product Liability Directive were not reviewed in this contribution. However, it should be noted that that these initiatives possibly could address (some of) the abovementioned problems, for example by alleviating the victims' burden of proof by introducing the 'presumption of causality' (in the AI Liability Directive).

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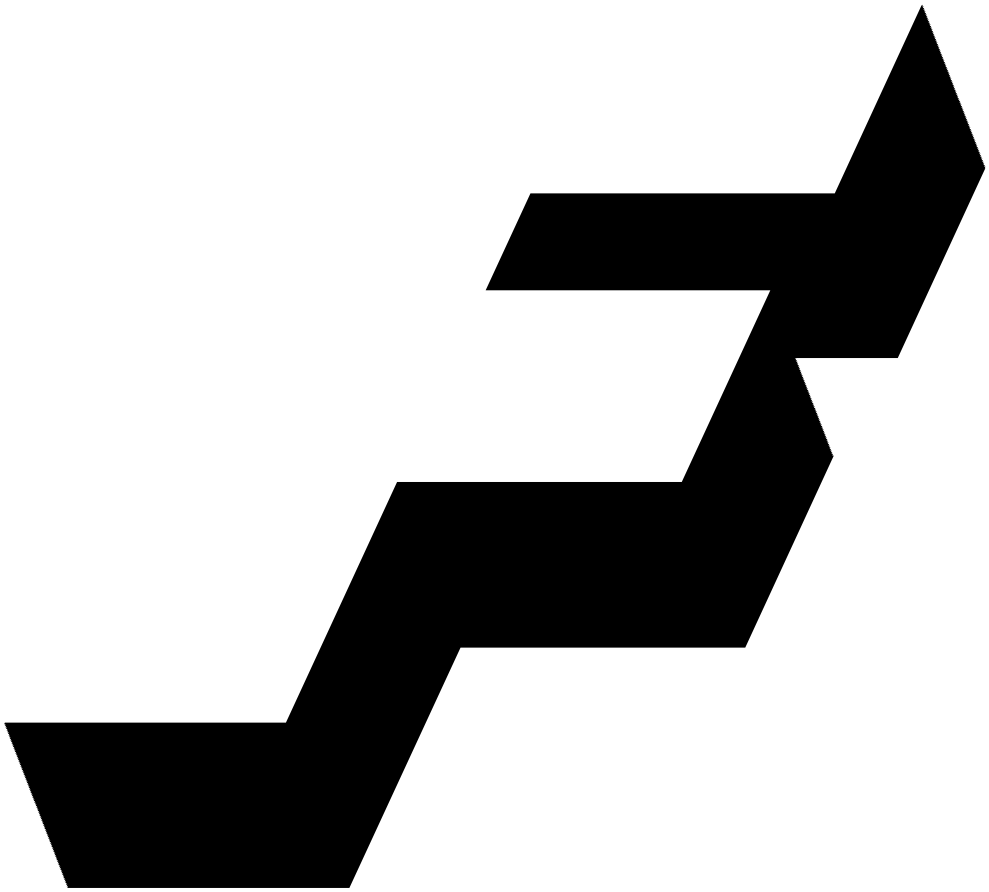

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