"Regulating Big Data effects in the European insurance market"

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| | (R) http://www.researcherid.com/rid/N-6000-2015 |

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
16	3	0

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Abstract

The article analyzes the regulatory framework in the insurance market in connection with the advent of Big Data, such as information collected from different sources that can be manipulated by new technologies. The use of Big Data offers significant opportunities to the insurance companies in terms of digitization of the distribution channels and greater knowledge of the customers, which is instrumental to a more effective identification of the individual's risk profile, as well as improvement of the competitiveness. However, regulatory measures are needed for a proper use of Big Data in terms of respect of the individual privacy, potential discrimination and constraint on competition.

Introduction

The increasingly widespread use of various digital devices generates a relevant quantity of information populating a growing number of databases. These are the Big Data, a huge amount of data that are combined with additional information collected from different sources, such as statistical offices, social networks and public administrations. It's not just the size that characterizes the Big Data, but we have also to consider them in relation to the new technologies that make possible their manipulation in a manner increasingly fast and targeted.

The resulting advantages are varied and, in general, allow to analytically define the user by tracing an accurate customer profile and differentiating, therefore, the price and the quality of the products supplied.

The collection and analysis of Big Data offer significant opportunities to insurance companies in terms of greater knowledge of the customers, which is instrumental to a more effective identification of the individual customer's risk profile, as well as improvement of the competitiveness of products and services with a progressive adaptation, in terms of quality and price, to the individual needs. In fact, insurance companies are increasing their investments in developing new technological applications, also in order to allow effective integration with the traditional data collection and distribution systems[1].

However, technological innovation and the use of Big Data cast doubts and generate discussions for the innumerable risks that might ensue for individuals concerned. In fact, the collection and storage of sensitive data and the ability to analyze single and collective behavior, given the possibility of processing billions of real-time information, represents a potential threat to the privacy of each of us. The main problems are related to the personal character of the analyzed data and to the use of personal devices for their acquisition, because the data are often collected from an unwitting customer.

Therefore is evident the need of attention by the regulatory authorities for the potential contrast with the privacy, as well as for the risk of some forms of "discrimination" against particular categories of customers.

In relation to the factors just mentioned, in this contribution, we describe the distribution characteristics and the digitization of the insurance market in the first section; the second will analyze the effects on information asymmetries and risk classification; the third is about the process of customization and the use of statistical discrimination; the fourth discribes the effects on competitiveness of the market. Final section includes conclusive remarks on regulatory measures for a proper use of Big Data.

1. The effects of digitization on the distribution in the insurance market

We live in a context of increasingly pervasive digitization and even the insurance industry is bound to a profound change triggered by the innovative technologies that are affecting the interaction between market players and the way to do business. So also the financial sectors, and, in

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[1] See, for example: Accenture Technology Vision for Insurance, 2016, available at: www.accenture.com; Morgan Stanley, Technology

Promises to Revolutionize the Insurance Industry, 2015, available at: www.morganstanley.com.

particular, the insurance one, are in the wake of the sectors that have invested first in the digital, as characterized by high volumes of commercial interactions. It is now necessary to use those technologies that allow online distribution, dematerialization of procedures and the collection of sensitive data of the customers, which can be used to personalize the supply.

Particularly the insurance distribution is driven by changes in consumers' needs and preferences and insurers have to invest in new technologies to create innovative ways of selling products that can

improve their service to respond to demand expectations.

Actually, insurance is sold either directly by insurers or through a number of different channels, the most common of which are brokers, agents and bancassurance. The popularity of each channel varies depending on both the characteristics of the market and of the insurance product.

In Figures 1 and 2, we see the differences in the distribution channels between the European countries in the life and non-life insurance sectors as a percentage of gross written premiums (GWP).
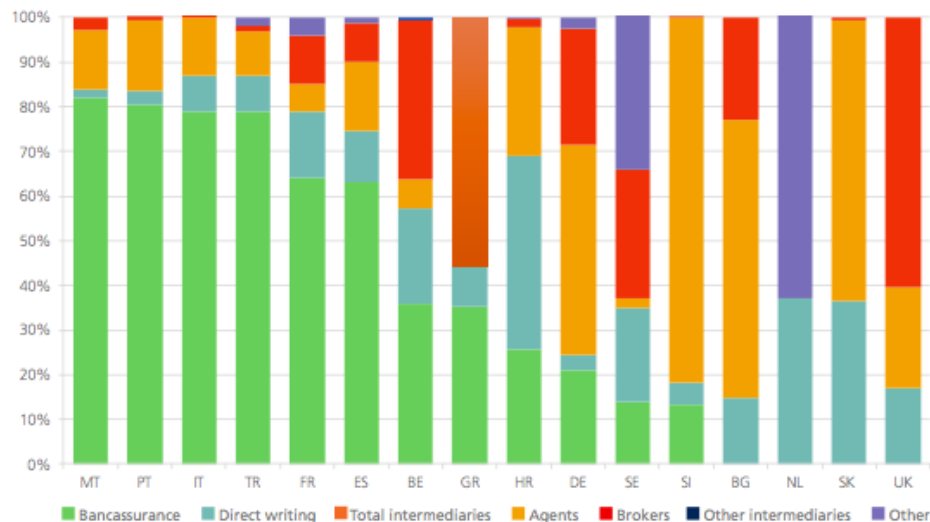
Fig. 1. Life distribution channels in 2014 (% of GWP)

Source: Insurance Europe (2016, p. 43).

In some countries, life insurance products are supplied via bancassurance, in Malta (82% of GWP), in Portugal (80%), Turkey and Italy (79%), France (64%) and Spain (63%); in other countries, most life products

are supplied by agents and brokers, such as Bulgaria (85%), United Kingdom and Germany (83% and 73%, respectively); agents alone are the main distribution channel in Slovenia (82%) and Slovakia (63%).
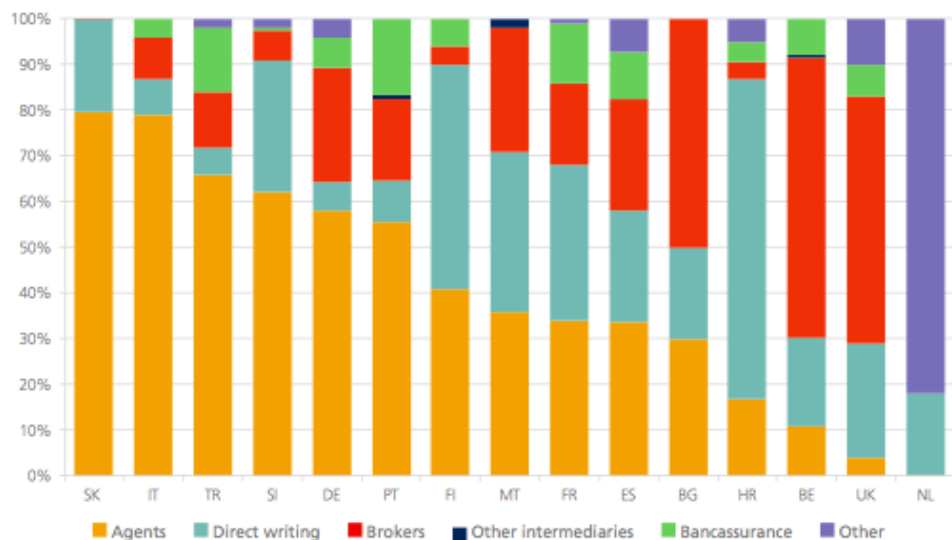

Fig. 2. Non-Life distribution channels in 2014 (% of GWP)

Source: Insurance Europe (2016, p. 44).

Non-life insurance policies are mainly distributed through agents and brokers. Agents predominate in

Slovakia (80%), Italy (79%), Turkey (66%), Slovenia (62%), Germany (58%) and Portugal

(56%). Meanwhile, brokers account for 61% of non-life premiums in Belgium and 50% in Bulgaria. In contrast, Croatia has the largest proportion of non-life products sold directly (70%).

Over the last years, traditional distribution channels have changed in the insurance market particularly because of the diffusion of internet and the connected opportunity of on-line sales. With the only exception of the Italian no-life sector, the agency channel has decreased in most European countries. The broker channel has not decreased so much, but some countries, especially the UK and the Netherlands, are characterized by a sort of "cannibalization" by the aggregator sites that have become very popular[1].

In fact, the diffusion of aggregator sites has been frequently at the expenses of brokers, especially the smaller ones, given the advantages in terms of price comparison and search costs reduction, that compensate the low level of services quality.

Aggregators have enabled self-directed consumers to fulfil more processes independently, that is easier for standardized products (such as motor) than complex ones (such as life), but is not restricted to the former. This is a process that drives to a greater polarization between a price-focus system and a quality focus one.

Another important trend is the increasing diffusion of the bank channel, even where the bank is structurally separate from the insurance company. The so called "bancassurance" is already an important player in the distribution of life insurance products, but we can expect that will increase the importance also in the distribution of the non-life ones.

We have just seen the changes in distribution connected with technological dynamics but we have also to consider the effects of regulatory innovation. Such as, the growth of banks distribution of life insurance products in France, Italy and Spain has been very much affected by liberalizing legislative interventions.

All this involves a special focus in terms of regulation and, in this context, arises the new European Directive on Insurance Distribution (IDD)[2] that has already triggered a process of public consultation in all European countries and among all stakeholders[3].

The IDD came into force on 22 February 2016 and updates the 2002 Insurance Mediation Directive (IMD)[4], which set out a framework for regulating EU insurance brokers, agents and other intermediaries. Member states have two years to transpose the IDD into national laws and regulations, i.e., before 23 February 2018 on which date it will repeal the IMD.

As a directive, the IDD provides a "minimum harmonizing" regulation and member states will be able to "gold-plate" it by adding extra requirements in the implementation. In any case, the IDD is intended to significantly raise the minimum standards of the IMD.

Where the existing IMD applies to the regulation of insurance intermediaries, the new IDD applies to the wider regulation of insurance "distributors". This means that it applies to all sellers of insurance products, including insurance undertakings that sell directly to customers: currently, the IMD applies to insurance intermediaries only. However, in order to level the market between direct and intermediated sales, the new directive applies to all sellers of insurance products including those that sell directly to customers[5].

The Directive confirms that insurance distribution takes place when websites or other media are used to provide information about insurance contracts in accordance with criteria selected by customers and there is a compilation of an insurance product ranking list, including price and product comparison, or a discount on the price of an insurance contract, and when the customer is able to directly or indirectly conclude an insurance contract using that website or other media.

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[1] For what concerns the definition, a price aggregator or price comparator is an internet platform, where insurance products from different suppliers are listed and compared (primarily in terms of price). From an economic point of view this can be considered as a form of intermediated sale, because a comparator website acts as a third party who facilitates transactions. Aggregators have emerged relatively recently.

[2] DIRECTIVE (EU) 2016/97 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 January 2016 on insurance distribution.

[3] According to Article 9(2) and Article 16 of Regulation (EU) No 1094/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (EIOPA), EIOPA is issuing Preparatory Guidelines addressed to competent authorities on how to proceed in the preparatory period leading up to the transposition of Directive (EU) 2016/97 of the European Parliament and of the Council of 20 January 2016 on insurance distribution (IDD) and the application of the delegated acts. The Preparatory Guidelines were issued for the purpose of establishing consistent, efficient and effective supervisory practices with regard to product oversight and governance arrangements as outlined in Article 25 of the IDD and to bridge the time until those provisions in the IDD are fully applicable.

[4] DIRECTIVE 2002/92/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 December 2002 on insurance mediation.

[5] This reportedly results in the IDD covering about 98% of the market, compared to about 48% of the market covered by the IMD.

In addition to distribution, the progressive digitization, though still gradual, has effects on the situation of asymmetric information characterizing the insurance market, as will be analyzed in the next section.

2. The effects of Big Data on asymmetric information and risk classification

The process of digitization and the availability of Big Data have effect on the issue of asymmetric information that characterizes the insurance market for which the insurance companies are not able to offer policies that reflect perfectly the risk characteristics of each customer. In particular, the insurer's lack of information is attributable to hidden information and hidden action (Arrow, 1963).

In the case of hidden information, it is impossible for the insurer to assume perfect information about the characteristics of the insured and consequently the premium is calculated on the base of the average probability. The result is a growing market concentration of individuals with high risk, as a result of the decision to those with low risk to not buy a policy that is too expensive for them. That is the phenomenon of adverse selection (Akerlof, 1970).

In the case of hidden action, instead, the difficulty of insurers to observe the behavior of the insured gives them the chance to behave incorrectly, in a sense in a "immoral" way (hence, the term moral hazard), adopting prevention measures to a lesser extent than those that they would take if they were not insured (Shavell, 1979).

In both cases described above, the insurance companies try to remedy the consequences of the asymmetric information issue.

The traditional remedy for adverse selection is to distinguish policyholders into categories with comparable risk levels and establish an appropriate premium, obviously making more expensive insurance policies for those categories of individuals with highest risk, to be able to compensate for the higher probability of occurrence of the event. In practice, companies operating in the way of highlighting the features about the tendency of individuals to be subject to the occurrence of certain events. In technical terms this is the "statistical discrimination" procedure, according to which the premiums are fixed so as to reflect the homogeneity in the rating of each risk class.

The companies use to divide the customers according to a certain classification based on information provided by the insured themselves and by the statistics. From this point of view, it is clear, therefore, the first positive effect of Big Data that provide further and more sophisticated information to the companies that can classify policyholders in a more refined way, as will be discussed in the next section.

In the case of moral hazard, companies need to compensate for the difficulty of observation of the subjective characteristics of the behavior of individuals. In addition to traditional remedies based on forms of partial coverage, another remedy is that companies carry a premium adjustment with occurrence of claims along time (the so-called experience rating). Again, a relevant effect can derive from Big Data as a source of information about the behavior of the insured individuals.

In fact, thanks to Big Data, insurance companies can now use instruments that can provide a new way of learning the habits of the consumers. In addition to the "black box" that have long been used by companies to determine the risk profile in the motor insurance, there are now new technologies that monitor the use and the condition of the insured property (such as cars), and the behavior of the individuals (such as the capacity of driving).

This new scenario opens up new prospects for the insurance market that shows not only growing opportunities, but also potential threats.

For what concerns opportunities, they can be summarized in two aspects linked together.

First, the policies will be more suited to the characteristics of risk of each customer: no longer rely solely on statistical expediency (backward-looking), but rather of analyzing behavioral predictive nature (forward-looking); more than this, pricing system can move from a static to a dynamic one, updated with increasing frequency according to a changing risk profile of each customer. Secondly, the business model will follow the same approach in terms of service delivery customization, with positive effects on prevention, risk reduction, and the improvement of claims management with a more accurate reconstruction of the claims dynamics and a consequent reduction in frauds and litigation; this will be easier thanks to the connection of objects, their traceability and the study of the personal data of every individual.

For what concerns potential threats, first of all, the companies may face higher costs due to increased complexity of pricing models, given that to develop new pricing models resources for the collection and analysis of Big Data are necessary. In addition, companies could be

pushed to dangerous collusive behavior from the point of view of competition regulation, as we will see in the fifth section. Futhermore, the possibility to provide a personalized charging could lead to encourage the best customers on a risk profile point of view with detriment of those worst, with a consequent reduction of the mutuality principle[1].

The evolution of the classification of risk may also involve further negative consequences as regards the privacy.

The Big Data are derived largely from mobile devices that are in the availability of each of us, as well as the interaction and the exchange of messages through social networks. This massive amount of information, often taken by users who are not aware of it, allows to make predictive assessments of the behavior of individuals in order to influence decisions or choices.

More and more personal data are involved, along with anonymous or aggregated data, and this raises concerns about the risks of new forms of invasion to privacy that may result from a more punctual and analytical customization.

It is, therefore, necessary to use a policy of protection ad hoc to cope with the fact that an increasing number of subjects, such as the insurance companies, are interested in exploiting the potential arising from the analysis of the data in terms of harm to privacy.

Trying to find a difficult balance between Big Data and privacy, the European Data Protection Supervisor on November 19, 2015, issued an opinion entitled "Meeting the Challenges of Big Data: A Call for Transparency, User Control, Data Protection by Design and Accountability", highlighting the most critical aspects of the current EU legislation, and providing the guidelines addressed to all stakeholders engaged in Big Data on how to operate in accordance with the legislation in force. The European Data Protection Supervisor has, therefore, recommended to apply: a transparent approach, allowing users to understand for what purpose the data are collected concerning them, and how will be used; a high

user control over the data by providing, for example, the possibility of unconditional opposition to the treatment (the so-called no-question asked opt-out); a series of internal control mechanisms to the company or organization, aimed at ensuring that the data operations comply with current regulations; the development of privacy-friendly software for interested parties to have transparency and guarantee of control over their data[2].

The point is to balance the interests at stake and to solve complex, technological, legal, organizational, social problems, as summarized in Figure 3.

Fig. 3. The link between Big Data and privacy

Source: European Data Protection Supervisor (2015, p. 5).

Proper regulation of the relationship between Big Data and privacy cannot be separated from the issue of transparency of the objectives to be pursued by the insurance companies, by the authorities and by all those who hold, including private parties, relevant and sensitive data.

In this direction, the initiative in the United Kingdom of the Financial Conduct Authority (FCA) was decided in view of assessing the need for new future interventions in the field, launching in 2015 a public consultation to understand how insurance companies use Big Data and how the collection and use of such information is intended to change and have an impact on the insurance market in the next years[3].

"Although the collection and usage of data has been essential for the insurance industry for a long time, the FCA believes that the use of new

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[1] "'Mutuality' is the normal form of commercial insurance, whether or not it is run by a mutual insurance company or one owned by shareholders. Applicants contribute to the pool through a premium that relates to their particular risk at the time of the application perceived, as well as it can be at that time on the basis of all the facts that are available and relevant, with or without application to any astrologers. The pooled funds, then, pay those insured who suffer losses in accordance with the scale of their losses for things like fire, household and marine insurance, or in accordance with the agreed sum assured for life insurance" (Wilkie, 1997, p. 1042).

[2] On 15 December 2015, the European Parliament, the Council and the Commission reached agreement on the new data protection rules, establishing a modern and harmonized data protection framework across the EU. The European Parliament's Civil Liberties committee and the Permanent Representatives Committee (Coreper) of the Council, then, approved the agreements with very large majorities. The agreements were also welcomed by the European Council of 17-18 December as a major step forward in the implementation of the Digital Single Market Strategy.

[3] Financial Conduct Authority (FCA), Call for Inputs: Big Data in retail general insurance, November 2015. Available at: www.fca.org.uk.

data sources requires investigation in order to assess how Big Data will change the industry over the next five years". The Call for Inputs outlines the following main areas for which a feedback from the insurance companies and from customers is requested.

First of all, new sources of data are being used in the insurance market (such as telematics boxes, data retrieved from shopping habits and personal devices and information sourced from third party providers, such as price comparison websites and social media). The issue is, therefore, how the sources and types of data have changed till now and how they are likely to change further over the next five years. "The FCA wishes to review how usage of Big Data might affect consumer outcomes. In particular, the FCA seeks to understand how use of Big Data may result in the increased segmentation of risk pools. As more information becomes available and improved predictive techniques are used, insurers may be able to estimate risks on a more granular level. This ability to segment potential customers on the basis of greater information may have different outcomes for consumers who might previously been considered to fall into one generic risk pool. Depending on the decisions taken by insurers, greater ability to segment the risk pool may result in new lines of business opening up for specific customers who might otherwise have been excluded from coverage, but may also result in some customers being unable to buy insurance. The latter outcome is a particular concern for the FCA in relation to vulnerable consumers".

Secondly, on a competition point of view, the Call regards both the demand and the supply side. On the demand side, the issue is how Big Data affects the consumers' ability to search and finally buy insurance products that best meet their needs. On the supply side, the issue is how Big Data affects the behavior of firms in terms of the products that they offer to their customers and how firms interact with each other and third party providers.

Thirdly, on a regulatory point of view, the Call is seeking feedback on whether the regulatory rules already in force either limit or support companies in their use of Big Data and whether any changes would stimulate the improvement of insurance products in the interests of consumers.

3. The process of customization and the use of statistical discrimination

With the use of Big Data, it is, thus, possible to implement a more accurate customization of policies through the practice of the risk classification, which, as we have analyzed in the previous paragraph, is based on the use of observable parameters, statistically correlated with the size of the risk. Consequently, the classes of policyholders correspond to different levels of premium that reflects the risk[1].

For an assessment of the efficiency of this instrument in strictly economic terms, it is necessary to take into account that any variable can be observed at some cost: for the classification to be convenient, it is not enough that each variable is significantly correlated with the risk; it must also be observable by the insurance company at a cost that does not exceed the benefits of the classification itself. Furthermore, the efficiency of the classification depends, as is obvious, on the ability of insurance companies to divide correctly the insured individuals (Porrini, 2015).

The Big Data and new technologies are now able to make the classification less expensive and much more sophisticated. Companies can take advantage of huge amounts of data and, then, build risk profiles of their customers very carefully, using a range of information that is now available at low cost. Just think of the information coming from social media, from relational networks, from the mobile, the geolocator, which allow to define at individual level many personal features.

So, in addition to the effects on information asymmetry just analyzed, Big Data involve significant changes in the functioning of the insurance market for the phenomenon of the customization of the policies. In fact, Big Data allow for a more dynamic risk management, nearly real-time, resulting in an evolution of the business model in the sense of so-called data mining, i.e., the set of extraction techniques and methodologies which have the object of a knowledge from large amounts of data and operational use of this knowledge, and the so-called predictive modelling, i.e., the data modelling and the algorithms writing to make predictions about future events.

As an example, in motor insurance is now possible to implement an accurate and personalized risk assessment through the combination of analytical models, such as behavioral ones based on the customer profile data, with a continuous stream of real-time information originating from satellite data, weather forecast and road traffic sensors. The customization process brings from a rate system based on consumption (pay-as-you-drive) to a rate

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[1] About risk classification features: Austin (1983), Chamberlin (1985), Abraham (1995).

system based on the driving style (pay-how-you-drive). The consequent personalized pricing may then, support and encourage a better driving style (even through advanced driving courses and possible feedback to be sent to the driver) by lowering the risk and, thus, the tariff to be applied.

The use of Big Data and the subsequent customization of policies may well lead to discriminatory treatment linked to the opportunity for companies, through knowledge of personal characteristics, to differently treat certain special categories of individuals, discriminating them against others. The mass of data can be used to discover deeply customs and choices of every internet navigator in a manner to draw a very precise profile of an individual that can lead to a real labelling with discriminatory effects.

We have already seen the process of "statistical discrimination", for which the premiums are fixed so to reflect the riskiness of each individual according to the characteristics of a particular category, to which it belongs and to which is assigned a particular level of risk. But a statistical discrimination may have some implications that can be seen as contrary to the general principles established to protect individual freedom (Avraham et al., 2014).

For years, regulatory provisions were issued in order to impose legal restrictions on the use of discriminatory variables, in particular those relating to race, religion and gender. Currently the possibility of using risk variables is limited to the general principle that it is forbidden to use the variables that might result in "discrimination" among consumers, and this is regardless of the fact that the same variables can express significant risk factors (Thiery and Schoubroeck, 2006).

According to the principle of equal treatment of individuals requiring that consumers can not be discriminated, the European Directive n. 113 of 2004, the so-called "Gender Directive", provides for the principle of equal treatment between men and women in terms of access and provision of goods and services, including insurance.

With particular reference to the insurance market, in 2011, the European Court of Justice ruled that the use of gender as from insurers risk factor should not result in individual differences in premiums and benefits on the basis of sex with the effect of preventing companies to differentiate policies for men and women[1].

Beyond the specific use of the gender and of other variables, such as race and religion, Big Data may result in the possibility of discriminating sensitive categories on the basis, for example, of risk of genetic type or of the life habits that may today be revealed through navigation in internet.

In this sense, for what concerns the member states, the 27 April 2016 the Parliament and the EU Council approved the Regulation 2016/679 on the protection of individuals with regard to the processing of personal data and on the free movement of such data. The act will come into force on 25 May 2018 and the declared purpose of granting the states the time to prepare properly of national laws.

Art. 4 n. 4 defines "profiling" any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a person, in particular to analyze or predict aspects concerning that person's performance at work, economic situation, health, personal preferences, interests, reliability, behavior, location or movements.

Art. 9 n. 1 prohibits the processing of personal data revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, or trade union membership, and the processing of genetic data, biometric data for the purpose of uniquely identifying a person, data concerning health or data concerning a natural person's sex life or sexual orientation. But there are also significant derogations including the explicit consent, medical and health reasons, statistical, historical and scientific surveys.

The person whose data are processed has various rights such as access, correction of inaccurate data and right to deletion.

Art. 35 introduces the innovative institution of the data protection impact assessment. Particularly where a type of procedure using new technologies, and taking into account the nature, scope, context and purposes of the processing, is likely to result in a high risk to the rights and freedoms of persons, the controller shall, prior to the processing, carry out an assessment of the impact of the envisaged procedure operations on the protection of personal data.

The Regulation finally rules in meticulous way tasks and duties of those who process data, institutional controls to which they have to undergo, the complaints procedures and protection for any violations.

4. The effects of Big Data on competition

The Big Data, offering companies a huge amount of information to understand the actions of their

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[1] C-236/09, Test-Achats, 1 March 2011.

competitors, are a powerful pro-competitive tool to give faster response to demand conditions. On the other hand, if used improperly, they can cause adverse effects on market competition.

In fact, through Big Data companies can very easily send signals to their competitors and monitor their reactions to these signals resulting in significant risks of tacit price-fixing. And, once there is a price-fixing agreement, it is much easier for the parties to perpetuate the agreement as the behavior that "deviates" from the agreement emerges more clearly.

In fact, many cartels that fix price dissolve not for the intervention of competition authorities, but rather because of the economic incentives to "deviate", selling at a price below the one of the cartel. The Big Data, then, provide a mechanism to monitor the prices of the cartel members. Accordingly, in addition to an increased risk of having a price-fixing, this choice is also characterized by a higher probability that the agreement will survive for long (Kalyvas and Overly, 2015).

Another aspect is the connection between risk classification, analyzed in the previous section, and the competitive market structure. On the one hand, the competition can be seen as a positive process to achieve a more accurate definition of risk classes. On the other hand, the classification can be used to segment the market identifying new risk categories to be more competitive in relation to other insurance companies. And, in fact, the companies tend to offer contracts different and new also with the intent to select the best customers, i.e., the ones characterized by lower risk levels, implementing the so-called "cream skimming" conduct.

Moreover, the choice of the companies to diversify their supply implies effects on the demand side, because it becomes more difficult for the customers to compare contracts that are characterized by an increasing level of inhomogeneity. The supply of differentiated contracts increases the problems related to the type of insurance to select, increasing the negative consequences of information asymmetry suffered by the customer about the nature and content of what they buy.

However, with the advent of Big Data contracts become simpler and so their comparison. The companies, in fact, having available a large amount of data, may implement a sophisticated differentiation, but that no longer requires the assessment of the characteristics of customers through complex questionnaires. In addition, the

contracts are lesser characterized by the inclusion of clauses against incorrect behaviours, because they are directly verifiable through new technological monitoring tools.

In any case, on a competition point of view, companies are encouraged to acquire information to define risk classes more and more accurately and, in this sense, the possibility to collect and analyze Big Data can be improved by the practice of exchange of information.

As seen above in relation to the application of the remedies to information asymmetries, the insurance companies need information to determine the risk profiles of the persons to be insured and, once the insurance policy is signed, information to define the behavior of the insured person. From this point of view, the exchange of information on the risk characteristics of clients can improve the quality of contracts.

But, on the other hand, information exchange behavior could also present anti-competitive effects because of its potentiality for giving rise to a collusive equilibrium, that is why exchange behavior is called a "facilitating practice"[1].

Because attempts to collude are often accompanied by intensified communication between firms and usually collusive behavior is not directly verifiable by the competition authorities, information exchange behavior often is considered as a facilitating practice by the competition authorities. In fact, given the correlation between communication and collusion, this behavior is a particularly credible signal of anti-competitive conduct (Kuhn and Vives, 1995) and intervention against collusion may rely on suppressing behaviors facilitating collusion[2].

In practice, when the competition authorities cannot directly detect collusion on price, they consider exchange of information behavior as a facilitating practice, especially in cases where there are no explicit collusive agreements in a legal sense, but only forms of tacit collusion, characterized by scarcity or lack of statistical evidence that goes along with collusive agreements (Porrini, 2004).

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[1] We can define as facilitating various practices like information exchange that try to limit the influence of factors that destabilize co-operative outcomes and enhance the factors that support co-operative outcomes. So, even if information exchange in itself is not a restriction on competition, the competition authorities can concentrate on detecting specific information exchanges in their role of sustaining explicit and tacit collusion.

[2] The exchange of information among firms produces the benefit of being better informed (this is the so-called "precision" effect) about the choices of all the firms operating in the market with subsequent collusion on a joint target.

In this sense, within the EC competition regulation, information exchange behavior would normally be defined an infringement of Article 85 of the EC Treaty, outlining its effect of distorting competition. So, starting from the end of the 1980s, the European Commission has began confronting anti-competitive arrangements between insurance undertakings, principally applying Article 85.1 of the EC Treaty, which prohibits agreements between undertakings restricting competition in a substantial part of the common market (Esteva, 1997).

But, on the other hand, the Commission also recognizes that certain characteristics of the insurance sector require a degree of informational communication between insurers. Article 85.3 of the EC Treaty grants exemptions to agreements concerning information exchange that would have otherwise been prohibited, when they improve the economic efficiency and provide benefits to consumers. Most of the Commission's work has been to define the types of agreements that could benefit from this exemption. And, in 1992, the Commission adopted a block exemption regulation in the insurance field, the Commission Regulation (EEC) no. 3932/92 of 21 December 1992 on the application of Article 85 (3) of the Treaty to certain categories of agreements, decisions and concerted practices in the insurance sector. This Commission Regulation exempts certain agreements within the insurance industry from cartel prohibition on the basis of some peculiarities of the insurance industry[1].

Big Data, therefore, could be a strong incentive to the exchange of information and in the next future the competition authorities will be called upon to decide on new cases characterized by exchange of information with competitors or trade associations, possibly through intermediaries,

in order to take advantage of the mass of data from new sources, such as social networks and databases.

The European Commission is about to revise Regulation 358/2003 in order to assess whether the exemption should be extended in relation to some of the currently covered practices or reduced in relation to other practices. It would be desirable to take account of the consequences of Big Data and new forms of joint processing of data for their effects on competition.

Conclusion

To be successful and competitive in an insurance market in constant evolution, it is clear that companies must utilize Big Data and their processing and in the future we can easily predict that the information collected through new technologies will play an increasingly important role in solving some of the biggest challenges in this market.

Probably the European insurance companies will soon have to contend with more stringent rules regarding the use of Big Data, particularly those applied for risk classification. According to what is recently stated by ESAS[2], one of the prior targets will be precisely to monitor the current management of the Big Data and evaluate whether it is necessary to regulate with more adequate provisions to protect consumers.

Taking into account the information asymmetries which characterize the insurance market, in the analysis conducted in this contribution is apparent that the next challenges from the point of view of the regulation will be in three directions: in the first place, the collection of data must not affect the privacy of individuals; secondly, the classification of risks, while improving the efficiency of the market, must not become a constraint on competition; thirdly, the use of data on the personal lives to customize policies should not be an instrument of discrimination.

Finally, another prominent theme about Big Data is their global appearance which may involve a conflict between rules emanated from different countries, which provide different regulatory solutions. From this point of view, it becomes very important to uniform in the regulation for the use of the Big Data that will increasingly be a matter not just at a national level.

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[1] In particular, as stated literally by art. 2, the exemption concerns agreements, decisions and concerted practices which relate to:

(a) the calculation of the average cost of risk cover (pure premiums) or the establishment and distribution of mortality tables, and tables showing the frequency of illness, accident and invalidity, in connection with insurance involving an element of capitalization – such tables being based on the assembly of data, spread over a number of risk-years chosen as an observation period, which relate to identical or comparable risks in sufficient number to constitute a base which can be handled statistically and which will yield figures on (inter alia): the number of claims during the said period, the number of individual risks insured in each risk-year of the chosen observation period, – the total amounts paid or payable in respect of claims arisen during the said period, the total amount of capital insured for each risk-year during the chosen observation period;

(b) the carrying-out of studies on the probable impact of general circumstances external to the interested undertakings on the frequency or scale of claims, or the profitability of different types of investment, and the distribution of their results.

[2] JOINT COMMITTEE OF THE EUROPEAN SUPERVISORY AUTHORITIES, 2016 Work Program of the Joint Committee of the European Supervisory Authorities, JC 2015, 055.

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