



# Digital Transformation and Risk Mitigation in Emerging Insurance Markets: A Comparative Analysis Between China and Serbia



Katica Radosavljević\*

Faculty of Economics, University of Belgrade, 11000 Belgrade, Serbia

\* Correspondence: Katica Radosavljević ([katica@ekof.bg.ac.rs](mailto:katica@ekof.bg.ac.rs))

**Received:** 04-29-2023

**Revised:** 05-25-2023

**Accepted:** 06-02-2023

**Citation:** Radosavljević, K. (2023). Digital transformation and risk mitigation in emerging insurance markets: A comparative analysis between China and Serbia. *Oppor Chall. Sustain.*, 2(2), 104-115.  
<https://doi.org/10.56578/ocs020205>.



© 2023 by the authors. Licensee Acadlore Publishing Services Limited, Hong Kong. This article can be downloaded for free, and reused and quoted with a citation of the original published version, under the CC BY 4.0 license.

**Abstract:** Recent trends indicate a deceleration in the growth of insurance markets in developed countries, whereas emerging insurance markets, predominantly in Southeast Asia, and led by China, demonstrate a remarkable increase in total gross premiums. This contrast, largely attributed to digitalization of insurance operations, underscores the need for understanding and integrating technological innovations within the insurance industry. Faced with emerging risks such as climate change, natural disasters, epidemics, pandemics, and cyber threats, insurance companies must implement proactive risk prevention strategies alongside enhancing their risk mitigation instruments. Utilizing comprehensive, country-specific alert systems can aid in evaluating risk profiles and managing the emergent risks more efficiently. While Serbia's efforts towards digital transformation in the insurance sector are still budding, there remains a significant potential for growth and introduction of innovative insurance products. However, the lack of adequate preventive measures against risks such as natural disasters has hampered its full development potential in sectors like agriculture and tourism. On the other hand, China's approach to managing natural disaster risks through robust institutional support and an innovative insurance market offers valuable insights. This study aims to highlight the significant challenges posed by modern trends in the insurance industry, emphasizing the case of China, and suggesting ways for insurance companies to respond to these challenges. Moreover, it assesses the readiness of the Serbian insurance market in managing natural disaster risks and provides a roadmap for the integration of technology within the insurance sector.

**Keywords:** Climate change; Natural disasters; Risk management; Inform index; Insurance; Digital transformation

## 1. Introduction

While the growth trajectory of insurance markets in developed nations demonstrates a decelerating trend, anticipated to persist in forthcoming periods, emerging insurance markets paint a contrasting picture. These nascent markets are witnessing a surge in total gross premiums, facilitated by the bolstering of their respective economies. A testament to this trend is the substantial growth experienced by developing nations within the Southeast Asian region, predominantly led by China, attributing their success largely to the digitalization of insurance operations. In comparison, Serbia's digital transformation within the insurance industry is in its infancy, though the potential for the development and introduction of novel insurance products through its application remains promising.

The spread of globalization is shown to diminish the disparity between global average insurance premiums and those within individual countries, particularly in the realm of life insurance (Arslan et al., 2018). In attempts to sustain profit margins, numerous insurance companies have resorted to transient solutions, such as cost reduction through process automation, downsizing staff, or outsourcing. Projections for the insurance market growth hover around 5% for the next decade (The View: Global Insurance Market at a Crossroads, 2019). However, an increasing number of insurers recognize these measures as insufficient for survival in the contemporary market, characterized by constant innovation, escalating policyholder expectations, emerging competitors, and an array of new risks. As key actors in the corporate world, insurers advocate for activities that reduce and prevent risks (Mills, 2005). Risks such as cyber threats, climate change and associated natural disasters, nuclear and atomic risks, terrorism and kidnapping, as well as the risk of epidemics and pandemics have garnered prominence. The latter,

with the onset of the Covid-19 pandemic, demands significant attention. Global population growth, urbanization, high urban population densities, expedited movement of people and goods, and climate change potentially leading to certain diseases, like the Zika virus, contribute to a heightened risk of epidemics and pandemics (Burns et al., 2006). However, despite the rise in the amount of research examining tourism and climate change, there are still significant gaps in previously published studies, in terms of the expertise in adapting to climate change, and especially in regard to financing climate change (Simpson et al., 2008). The instruments for predicting weather trends, used by the energy and agriculture sectors, were first created in the late 1990s, and are called weather derivatives. They are not adjusted to the needs of the tourism sector, as they are based on paying premiums for an insurance policy that covers losses in infrastructure, in case of floods or other catastrophic events (Zeng, 2000). According to the World Health Organization (WHO), 1,483 epidemics were recorded between 2011 and 2018, including Ebola, SARS (Severe Acute Respiratory Syndrome), swine flu, and the Zika virus (Yeung, 2006).

For instance, during the Ebola virus epidemic in West Africa in the period 2014-2016, it is estimated that over 10,000 deaths occurred as a result of not treating malaria, HIV and tuberculosis.

The Covid-19 pandemic is likely to have significant secondary consequences, due to the fact that immunization has been reduced by 30%.

In late 2019, Covid-19 developed in Wuhan, a province in China, and by March 2020 it had reached almost all parts of the world. The exact consequences that this virus will cause are still unknown. According to the latest data, as previously stated, almost 300,000 people died, and according to the latest World Bank estimate, from April 2020, it is believed, based on preliminary assessments, that there will be a loss of 2-4% of GDP at the global level (Maliszewska et al., 2020).

Epidemics and pandemics pose severe economic ramifications, reducing business volume, leading to company closures and rising unemployment rates, impacting consumer behavior, and decreasing demand. World Bank simulations estimate a severe pandemic to reduce global GDP by approximately 5% (Burns et al., 2006). Monitoring global trends and formulating accurate predictions are essential, as pandemics can exact devastating consequences, preventable only through meticulous planning and swift response. Unfortunately, most insurance companies were ill-prepared for the crisis (A World at Risk: Annual Report on Global Preparedness for Health Emergencies, 2019).

The emergence of these risks and the inherent issues associated with the traditional insurer business model provide opportunities for new market participants, especially Insurtech companies equipped with the necessary knowledge and technologies to cater to modern insurance needs (World Insurance Report, 2019). Proactive digitalization of their core system, introduction of new products, provision of coverage against new risks, and reimagining policyholder interactions are all part of the transformation process within insurance companies (Japan's Insurance Market, 2019).

The relevance of the need for insurance as an essential form of risk management is well demonstrated in the example of the Hungarian risk management system. The study of a farmers' survey prioritizing economic and ecological factors which influence the willingness of farmers to take out insurance policies shows a correlation between using crop insurance and production performance (Zubor-Nemes et al., 2018).

The future business of insurance companies should have a focus on policyholders, primarily in the field of greater accessibility and personalization of insurance products. Using behavioral economics can prove crucial here. Also, access to large databases of policyholders allows insurers to analyze customer behavior and needs and then find ways to meet these needs (Pritchett, 2019).

Food safety, linked directly to climate change, and its biophysical impact on agricultural and non-agricultural plant and animal life, necessitates increased investment aimed at boosting productivity and resilience in the food system. Efforts should be focused on insuring farmers against natural disaster risks to achieve the goal of eradicating hunger by 2030.

Disasters with greater insurance coverage can have less harmful consequences for the economy, as insurance helps finance reconstruction and reconstruction, thereby contributing to sustainable development. The total social cost of a disaster depends not only on the intensity of the initial damage but also on the speed at which recovery can be carried out (Linnerooth-Bayer & Hochrainer-Stigler, 2015).

Furthermore, behavioral economics can be leveraged to offer more accessible and personalized insurance products, using large policyholder databases to analyze customer behavior and needs. However, the possibilities offered by new technologies in the insurance field remain largely untapped. According to research by the Boston Consulting Group (BCG), insurers invest less in new technologies compared to other financial institutions. On average, insurance companies spend 5% of their revenues on technology development, while other financial sectors invest up to 10% (A Growing Urgency for Change in the Life Insurance Industry, 2019).

The objective of this work is to highlight the significant challenges presented by modern trends to insurers, with a special emphasis on China, and to propose ways insurance companies can respond to these challenges. A particular focus is placed on assessing the readiness of the Serbian insurance market to face natural disaster risks. Climate change exacerbates the risk of natural disasters. Quantifying this risk and the capacity to prevent damage from natural disasters opens up new research avenues to advance the global insurance market.

## 2. Methodology

This study employs a qualitative analysis and literature review approach to examine the role of insurance companies in risk prevention, particularly in the context of Serbia. We analyze multiple data sources, including academic journal articles, policy reports, public insurance company reports and statistics, as well as official macroeconomic and environmental data.

Firstly, we collected and read a broad range of literature on the insurance industry and its role in risk prevention, including theoretical and empirical studies. We paid particular attention to research that included information on how insurance companies use new technologies such as the Internet of Things to prevent risk, and how insurance companies prevent risk through education and advisory services.

Secondly, we delved into the insurance market in Serbia, looking at the size of the market, its growth, and the types of insurance products available. We also analyzed the country's macroeconomic environment, including employment, living standards, and investment environment.

Finally, we focused on environmental challenges in Serbia, particularly risks brought about by climate change, and how insurance companies can respond to these challenges through investment decisions and risk prevention strategies.

Based on a deep analysis of these data, we drew conclusions and recommendations about the role of insurance companies in risk prevention and the development of the Serbian insurance market.

## 3. Results and Discussion

### 3.1 Prospective Markets for Insurance Development

One significant milestone for the Chinese economy was its accession to the World Trade Organization in 2001, marking an era of open trade and an influx of foreign corporations. This liberalization, coupled with governmental support and intensifying globalization, fostered substantial growth in the Chinese market (A History of Insurance in China, Swiss Reinsurance Company Ltd., 2017). Presently, China stands as the world's second-largest insurance market (as shown in Table 1), trailing only the USA. Projections suggest that within the next 15-20 years, China could ascend to the top spot.

**Table 1.** Progression of China's insurance market development (in USD billion)

Year	Life insurance premiums	Non-life insurance premiums	Total premiums	Growth rate	Total global premiums	Chinese market share
1980	0	0.19	0.19	-	466.10	0%
1990	1.18	1.97	3.15	-	1407.58	0%
2000	10.28	9	19.28	-	2490.70	1%
2007	58.67	33.79	92.46	31%	4313.22	2%
2008	95.81	44.98	140.79	52%	4182.39	3%
2009	109.17	53.87	163.04	16%	4037.52	4%
2010	143.01	71.63	214.64	32%	4309.66	5%
2011	134.57	87.34	221.91	3%	4570.65	5%
2012	141.19	104.29	245.48	11%	4611.07	5%
2013	153.30	126.82	280.12	14%	4611.93	6%
2014	176.95	151.49	328.44	17%	4781.25	7%
2015	210.76	175.74	386.50	18%	4599.85	8%
2016	262.62	203.52	466.14	21%	4702.84	10%
2017	317.57	223.88	541.45	16%	4891.69	11%
2018	313.37	261.55	574.92	2%	5193.23	11%

Source: Swiss Re, Sigma explorer, <https://www.sigma-explorer.com>

In 2018, China's gross premium revenues amounted to USD 575 billion, representing 11% of global insurance premiums. Life insurance accounted for 55% of this total, generating USD 313 billion. The insurance premium per capita in 2018 was USD 406, while the insurance premium's contribution to GDP stood at 4.2%. These metrics underscore the immense potential of the Chinese market.

In recent years, China has primarily propelled the growth of the global insurance market, specifically in life insurance. For the first time in 2018, a negative growth rate was recorded in the Chinese life insurance sector, following the imposition of regulatory constraints by the China Insurance Regulatory Commission (CIRC). These reforms aim to guarantee long-term, sustainable insurance market development, indicative of China's entry into a novel growth phase.

Following an initial lull due to regulatory changes, China's insurance market is anticipated to rekindle its

previous rapid growth trajectory as insurers acclimate to the new regulations. Over the next decade, China's annual insurance premium growth is projected at 11%, far outpacing the USA's estimated annual growth rate of 2.6% (The View: Global Insurance Market at a Crossroads, 2019).

In Central-Eastern Europe, nations such as Bulgaria, Romania, Lithuania, and Serbia demonstrate the most potential for development, as determined by the relatively small contributions of their gross insurance premiums to GDP and their low per-capita gross premiums. The regional average of gross premiums' contribution to GDP remained stable at 2.5% compared to the previous year.

However, the same indicator dropped to 2.9% in Poland, owing to a decline in gross insurance premiums juxtaposed against GDP growth. Slovakia and Hungary, too, displayed higher GDP growth compared to gross insurance premium growth. Romania registered the smallest contribution at 1%, while Slovenia achieved the highest at 5.1%.

Between 2020 and 2024, the contribution of gross premiums to GDP is forecasted to grow twice as fast as that in developed countries, with life insurance sectors expected to see an average annual insurance premium increase of 7% (Central and Eastern Europe: The Future's Bright in Life, Economic Insights, 2020).

The Central-Eastern European insurance market undoubtedly presents considerable developmental potential. The region's relatively stable macroeconomic conditions, economic development, and income growth are expected to augment insurance demand in the future, particularly for life insurance. The lower GDP contributions and per-capita premiums in most countries indicate the region, including Serbia, has much room for growth. The following section presents an in-depth analysis of Serbia's insurance market.

### 3.2 The Inform Index: A Gauge of Insurance Market Sensitivity

Decades of technological and industrial progression have wrought indelible impacts on the global ecological system. An escalated frequency and intensity of natural disasters, including tsunamis, floods, and fires, are testament to the irreversible climate alterations incurred through chronic pollution and environmental negligence. The precise extent to which these alterations exacerbate natural disasters, however, remains largely speculative.

A notable revelation from the 2021 United Nations Global Report is the worldwide pervasiveness of malnutrition (Global Nutrition Report, 2021). Over three billion individuals are malnourished, with the majority of the planet's population consuming a nutritionally deficient diet. Amidst the burgeoning global populace, projected to approach 10 billion by 2050, ensuring sustainable and adequate access to quality, nutrient-rich food becomes paramount (Department of Economic and Social Affairs, 2021).

Insurance entities encounter the ramifications of climate change across three principal domains (Golnaraghi, 2018):

- A) Physical risks, attributed to climatic conditions, encompass hazards such as fires and floods;
- B) Liability risks transpire via insurance costs transferred due to litigation;
- C) Economic risks pertain to potential expenses corporations may face, such as the obligation to incorporate clean technologies.

Several prevailing global trends amplify these risks (Carroll et al., 2014):

Augmented frequency of natural disasters, ranging from earthquakes and floods to fires and tsunamis, affect life, property, business interruption insurance, among others.

Diminishing natural resources incur higher business input costs, potentially ceasing operations.

Renewable energy usage entails substantial infrastructure establishment costs.

Environmental responsibility subjects corporations to increasing reputational risk. For insurers, regulatory compliance and adaptability to changes are crucial.

In addition to primary hazards, secondary hazards bifurcate into two groups (Golnaraghi, 2019):

A) The first group features hazards independent of primary ones, typically occurring more frequently but with lower intensity, such as floods, landslides, droughts, and wildfires. These are often overlooked and unmodeled by insurance companies.

B) The second group comprises hazards arising from primary hazards, often resulting in substantial negative impacts. The unpredictability and modeling difficulties of these secondary effects often exclude them from insurance coverage.

Potential mitigation lies in leveraging technological advances, primarily artificial intelligence, to better monitor and model these risks, expedite claims processing in catastrophic events, and develop insurance products that encompass these risks.

The rising tide of environmental risks necessitates proactive measures from insurance companies to mitigate potential damage (Golnaraghi, 2019). This can be achieved by educating policyholders on damage reduction strategies or following the lead of prominent European insurers and reinsurers, such as Swiss Re, Munich Re, Allianz, AXA, Generali, and Zurich Insurance Group. These companies, having signed the United Nations Sustainability Principles, are making significant strides in pollution reduction by refusing coverage to coal-powered plants and investing in green technologies (Sustainable Insurance Forum and UN Environment, 2018).

This policy has already reaped benefits, resulting in a drastic decline in new power plants and an accelerated decrease in coal emissions. Following the European initiative, this approach is gradually proliferating globally.

The insurance market's growth is inextricably linked to the development of the national economy, as evidenced by Serbia, Croatia, and Slovenia.

Figure 1 illustrates the trend of insurance premiums' share in the gross domestic product of Serbia, Slovenia, and Croatia. From the data, the insurance premiums' contribution to Serbia's total gross domestic product (GDP) is relatively minimal, peaking at 2.1% during the observation period. The nadir of 1.8% was observed from 2012 to 2014, incrementing to 2% in 2015, and finally reaching 2.1% in 2016 and 2017, the apex for the period.

It would be instructive to augment this discussion with a comparative analysis of the insurance premiums' contribution to the GDP in Slovenia and Croatia (Table 1). The table could shed light on the variance in the development of insurance markets across these economies, potentially revealing pertinent factors for further investigation. It is, however, crucial to understand that numerous elements influence the sensitivity of these insurance markets, hence this data should be seen as a part of a larger whole.

The largest contribution of insurance premiums to Slovenia's total GDP occurred in 2012 (5.3%), with consistently high values maintained over time and a slight downward trend beginning in 2015. By the end of 2020, this share dropped to 3.5%, probably due to the Covid-19 pandemic.

The contribution of insurance premiums to Croatia's GDP has been more significant than in Serbia, peaking at 2.85% in 2020 and dipping to its lowest point of 2.48% in 2017.

The disparity in the development of these insurance markets can be attributed to the varied economic development of these countries. As one of Europe and the world's more developed economies, Slovenia boasts a well-developed financial system, including its insurance sector. This development allows the Slovenian insurance market to contribute significantly to national economic growth, creating a disproportion in the insurance market development levels between Slovenia, Croatia, and Serbia.

Croatia is also counted among the more developed economies, albeit to a lesser extent than Slovenia. As an EU member, Croatia's expected progress may spur the development of its insurance market. Serbia, however, is not considered a developed economy. The country is still undergoing a transitional phase, causing the economy to advance at a slower pace and resulting in a less developed financial system, including the insurance market, compared to Croatia and Slovenia.

Figure 2 presents the GDP growth rate for Serbia, Slovenia, and Croatia. Data reveals that the COVID-19 pandemic significantly impacted the GDP growth rate in 2020, with Slovenia and Croatia experiencing a negative GDP growth rate of -5.5% and -8.37%, respectively. In contrast, Serbia saw a drop of just 1% during the same period.

The larger decline in Croatia and Slovenia can be attributed to their tourism and hospitality industry's significant contribution to their GDP. Conversely, Serbia's smaller decline is attributed to the dominant role that the processing industry plays in its GDP and the growth of domestic tourism in 2020 as a fallback during the pandemic.

The INFORM index serves as a useful tool in assessing the sensitivity of insurance markets in various countries. As Table 2 illustrates, the risk profiles for Serbia, Croatia, and Slovenia show different degrees of vulnerability. According to the INFORM index, Serbia is the country with the highest risk among the three, with a risk index of 2.8, primarily due to a lack of capacity (institutional and infrastructural) to prevent hazards. On the other hand, Croatia has the highest exposure index (92) compared to Slovenia and Serbia but is less vulnerable due to its better institutional and infrastructural capacity to prevent hazards.

Figures 3 to 5 further illustrate the risk class for Serbia, Croatia, and Slovenia based on the INFORM index. It's clear from these figures that while Serbia has the highest overall risk, Croatia has the highest risk of exposure to dangers.

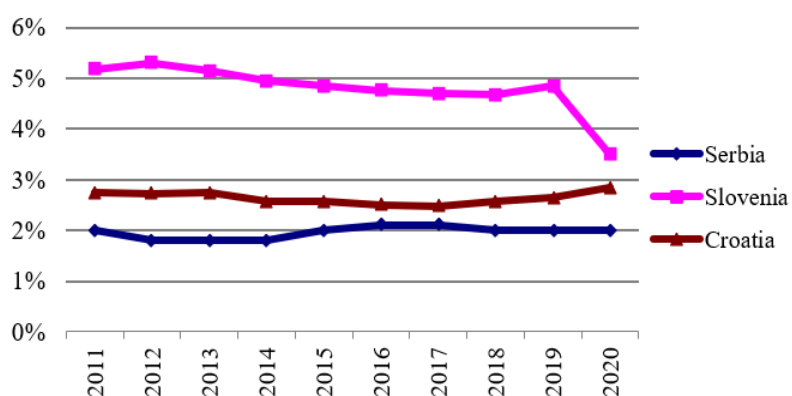
Comparative analysis, such as the one presented between China and Comoros (Table 3 and Figures 6 and 7), further underscores the importance of institutional and infrastructural capacity in mitigating risks. Both countries have an INFORM index of 3.7, placing them in the medium-risk category. However, the hazard exposure index for China is higher (5) compared to Comoros (1.5). Despite this, China's developed institutional and infrastructural support system contributes to a lower capacity index (3.3) compared to Comoros (7.1), thereby reducing its overall vulnerability.

**Table 2.** Countries by risk

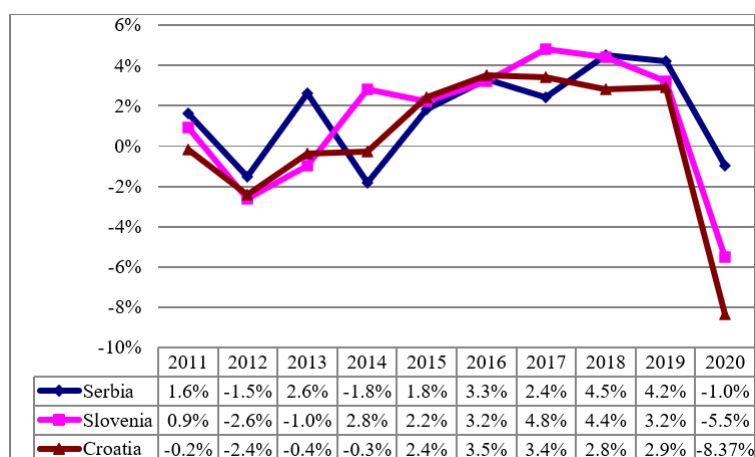
Country	INFORM Risk	Rank	Hazard & Exposure	Natural Hazard & Exposure	Vulnerability	Lack of Coping Capacity
Serbia	2.8	124	2.5	4.4	2.4	3.7
Croatia	2.6	132	2.8	4.8	2	3.1
Slovenia	1.6	176	1.9	3.4	1.3	1.6

Source: <https://drmkc.jrc.ec.europa.eu/inform-index>





**Figure 1.** The trend of insurance premiums' share in the gross domestic product of Serbia, Slovenia, and Croatia  
Note: This figure was prepared by the author



**Figure 2.** GDP growth rate for Serbia, Slovenia, and Croatia  
Source: [www.stat.gov.rs](http://www.stat.gov.rs), [www.stat.si](http://www.stat.si), <https://www.dzs.hr>



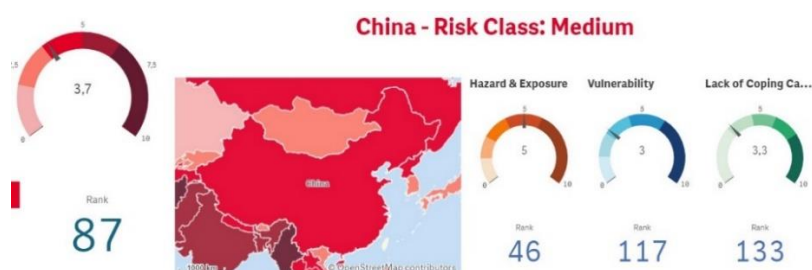
**Figure 3.** Serbia – Risk class  
Source: <https://drmkc.jrc.ec.europa.eu/inform-index>



**Figure 4.** Croatia – Risk class  
Source: <https://drmkc.jrc.ec.europa.eu/inform-index>



**Figure 5.** Slovenia – Risk class  
Source: <https://drmkc.jrc.ec.europa.eu/inform-index>



**Figure 6.** China – Risk class  
Source: <https://drmkc.jrc.ec.europa.eu/inform-index>



**Figure 7.** Comoros – Risk class  
Source: <https://drmkc.jrc.ec.europa.eu/inform-index>

**Table 3.** Countries by risk

Country	INFORM Risk	Rank	Hazard & Exposure	Vulnerability	Lack of Coping Capacity
Comoros	3.7	87	1.5	4.6	7.1
China	3.7	87	5	3	3.3

Source: <https://drmkc.jrc.ec.europa.eu/inform-index>

**Table 4.** Total catastrophic damages incurred in 2022 and damages incurred as a result of natural disasters

<b>Total catastrophic damages in 2022</b>	USD 284 billion
<b>Total damages from natural disasters in 2019</b>	USD 275 billion
<b>Total insured catastrophic damages in 2022</b>	USD 132 billion
<b>Insured losses from natural disasters in 2022</b>	USD 125 billion

Source: Swiss Re. (2023). Natural catastrophes and inflation in 2022: a perfect storm. Sigma 1/2023

The global economic losses due to catastrophic events in 2022 were estimated at 284 billion dollars, with insured losses amounting to 132 billion dollars. Of these insured losses, natural catastrophes (NatCat) accounted for 96.83% (\$125 billion) (Natural Catastrophes and Inflation in 2022: A Perfect Storm, 2023). This data, presented in Table 4, clearly illustrates the significant financial implications of catastrophic events, particularly natural disasters.

To conclude, the development of insurance markets in different countries is strongly influenced by their overall economic development, institutional and infrastructural capacity, and exposure to hazards. These factors, along with global events like the Covid-19 pandemic, significantly impact the growth and resilience of these markets. Further research is needed to devise effective strategies for mitigating these risks and fostering the growth of insurance markets in developing economies.

### 3.3 Trends in Modern Insurance Markets

In light of emerging challenges, such as the entry of novel participants and technology adoption, the American insurance market – reputed as the world's most advanced – is undergoing substantial change. Research indicates a lag in digital innovation in North America compared to the European and Southeast Asian markets (Insurance through Leadership, 2018). Consequently, insurance companies with robust digital platforms are gradually permeating this market.

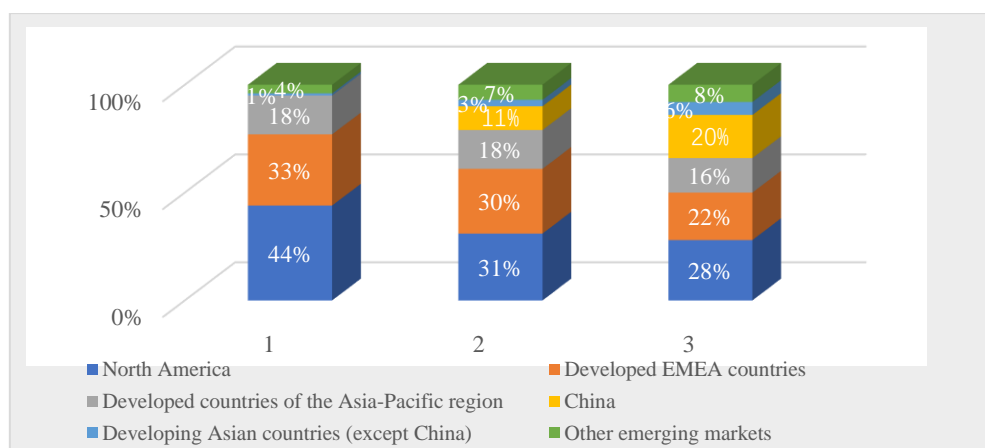
Regulatory frameworks in the insurance sector differ significantly across continents. While Europe and Asia typically have unified regulatory bodies, insurance regulation in the United States is state-centric, with the federal government and each of the 50 states having their own regulatory measures. This unique regulatory landscape is frequently a source of difficulty for insurance companies, necessitating constant vigilance and adaptation to comply with the regulations of each state. Contrastingly, in Europe and Asia, the market is typically regulated by a single governmental body.

The American market, traditionally conventional, is witnessing an influx of modern policyholders seeking ease of access, personalization of insurance products, and swift claims payment. In this regard, Europe has outpaced America. Insurtech companies, noted for their rapid adaptability, are more equipped to cater to these evolving policyholder needs than large traditional insurance companies. Growth opportunities in mature markets may be realized through the integration of technological advancements, the development of innovative insurance products and distribution channels, and cooperation with insurance companies. Besides, insuring newly emerging risks also offers substantial growth potential.

Mirroring North America, Europe's developed nations are contending with new technologies, increasing policyholder demands, and novel risks. Research suggests that the European market is slightly more adaptive to change and technology adoption than the American market (Insurance through Leadership, 2018).

The European insurance market operates under Solvency II regulations, which mandate stricter asset investment rules. These stringent regulations, coupled with the European Bank's low-interest-rate policy, have slowed growth, particularly in life insurance. Western Europe exhibits slightly higher digital innovation compared to the USA, with substantial strides made in data sharing among insurance companies and third parties, facilitated by supportive government strategies.

The insurance market in developing Southeast Asian countries is experiencing rapid growth due to accelerated economic development, population growth, and the rising middle class. As Figure 8 shows, the share of the global total insurance premium attributed to developed countries has decreased from 95% thirty years ago to approximately 79% today. It is projected that this trend will continue in favor of developing countries, particularly China, whose share is expected to nearly double (Sigma Explorer, 2019).



**Figure 8.** Expected changes in the share of the region's insurance premium in the global total insurance premium 1980-2029. (1-1980., 2-2018., 3-2029.) (%)

Source: Swiss Re, (2019), Sigma 3/2019, Swiss Re Management Ltd., p. 9

The Southeast Asian market is divided into two categories: countries with mature insurance markets (Japan, South Korea, Hong Kong, Taiwan, Singapore), and countries with developing insurance markets that have significant growth potential (China, India, Indonesia, Thailand, Laos, Vietnam, Philippines, Myanmar, Bangladesh, Cambodia) (Sigma Explorer, 2019).

The Japanese insurance market, which originated in 1868 with the Meiji Revolution, has surmounted numerous challenges over time, such as the Great Kanto Earthquake, the 1930s Depression, and World War II. However, it has demonstrated remarkable resilience and has developed significantly (A History of Insurance in Japan, 2017).



Today, Japan ranks third globally concerning gross premium, with life insurance contributing 76% of the USD 441 billion gross premium in 2018. Japan's insurance premium per capita and the contribution of insurance premiums to GDP both exceed the world average and that of North America and Western Europe (Sigma Explorer, 2019). World economy continuously works on modifications and improvements, particularly in the part related to the introducing of informatics support into all processes of production and selling, as a manner of increasing competitiveness (Zečević & Radosavljević, 2014).

This content offers an insightful exploration of the evolving insurance markets worldwide. However, a more in-depth discussion could be initiated on the strategies adopted by insurance markets in different regions to deal with these challenges and the effectiveness of these strategies. The potential opportunities for insurance companies in these markets could also be examined further. Moreover, the role of governments in shaping these markets and their effects on the growth and development of these markets would be a valuable addition to the discussion.

### **3.4 China's Ascendancy in Digital Innovation Within the Insurance Sector**

The emerging digital revolution has encompassed all sectors, insurance being no exception. Traditionally, the insurance industry, particularly in developed nations, has demonstrated a degree of resistance towards rapid technological adoption. Paradoxically, this traditionalism creates an opportunity-laden landscape for the insurance sector within China, a market characterized by its youth and dynamism (2020 Asia-Pacific Insurance Outlook - Driving Innovation and Transformation to Seize Opportunities and Sustain Growth, 2019; Insurtech 10: Trends for 2019, The Digital Insurer, 2019).

Interestingly, a comparative analysis between western and Chinese markets reveals a distinctive pattern. The West has been marked by the proliferation of insurance startups that compete with conventional insurance companies. Contrastingly, in China, it is predominantly the large insurance companies that drive innovation. They form strategic alliances with insurance firms, thereby facilitating a swift digitalization of the Chinese insurance sector. Moreover, a significant level of synergy exists between financial institutions and technological behemoths such as Alibaba and Tencent. The use of large-scale databases aids in understanding user behaviors and predicting insurance needs, making China a fertile ground for digital innovation (The Future of Insurance in Asia-Pacific Navigating InsurTech Issues in the Digital Era, 2020).

The digital evolution of Chinese insurance companies typically proceeds in three phases (Why Chinese Insurers Lead the Way in Digital Innovation, 2018):

A) Digitization of Core Operations: This involves establishing digital sales channels and automating the contract formulation process, including damage assessment and payments.

B) Diversification of Services: Services unrelated to traditional insurance, such as scheduling medical appointments or real estate purchases, are offered.

C) Integration of Policyholder Accounts: A comprehensive understanding of policyholder lifestyles and needs is obtained by connecting all their accounts.

Upon completion of these phases, insurance companies are equipped to deliver personalized insurance products that cater to specific policyholder needs. Additionally, such business models generate vast databases, enabling behavior prediction, risk assessment, and new insurance product development.

A prime exemplar of this business model is Ping An. This company has pioneered technological incorporation in traditional financial domains, including insurance, banking, and asset management. Besides, it has created five diverse internal ecosystems: financial services, healthcare, automobile services, real estate services, and smart city services. Ping An not only leads the insurance market in China but also stands at the forefront of the sector's digitalization globally. Its reputation was further consolidated when it co-founded Zhong An, China's first completely digital insurer, alongside Alibaba and Tencent.

China's advancements in digital insurance serve as an instructive model for insurance industries in North America and Western Europe. The remarkable progress made over the past decade emphasizes the necessity of reshaping business models to align with global trends.

Yet, this digital revolution brings novel risks alongside opportunities. Cyber risk, for example, poses a substantial threat, particularly due to the extensive personal data handled by insurance companies. Despite the cyber risk's growing importance, the insurance market is yet to develop adequate models to manage it. The advent of digital technologies like blockchain and the Internet of Things, along with Artificial Intelligence's ability to process and analyze data, presents promising opportunities in this regard.

Besides cyber risk, other significant risks such as those associated with climate change, natural disasters, nuclear activity, terrorism, kidnapping, and pandemics, demand the attention of the insurance market. These risks are unpredictable, sporadic, potentially catastrophic, and hence challenging to insure. The deployment of modern technologies, however, may alter this landscape, presenting unprecedented possibilities for the insurance market.

#### 4. Conclusion

The ongoing global transformation is precipitating radical changes in the insurance sector, with a seismic shift from traditional business models to more innovative, digitally-oriented approaches. This transition has been necessitated by the evolving needs of policyholders and the emergence of new risks that threaten global entities. It is noteworthy that the insurance sector has been somewhat slow in embracing the Fourth Industrial Revolution, thus creating opportunities for new market players, notably Insurtech companies. These entities leverage cutting-edge technologies such as blockchain, artificial intelligence, and the Internet of Things to cater to the needs of a digitally savvy demographic. At present, they pose significant competition to traditional insurance firms while simultaneously offering novel avenues for business digitization.

In some cases, traditional insurance companies are exploring collaborative ventures with Insurtech firms or outright acquisition to leverage the benefits of these technologies. Furthermore, some Insurtech companies have been established by traditional insurers, illustrating the symbiosis between these entities. Notably, in Serbia, digitization remains in its infancy with internet use primarily for advertising and information dissemination rather than direct sales. Innovations in this market are often sourced from foreign companies, as domestic entities exhibit limited initiative. Technologies like artificial intelligence and blockchain are yet to make significant inroads in the Serbian insurance market.

In developed countries, the insurance market growth is witnessing a slowdown, a trend expected to continue. In contrast, emerging markets are registering remarkable growth in total gross premiums, a phenomenon bolstered by economic development, advancement of financial markets, and improved living standards. These emerging economies, particularly in Southeast Asia with China at the helm, have experienced unprecedented growth largely attributed to the digitization of insurance operations.

There are vital lessons for Western countries to learn from these developing economies, particularly in the realm of technological investment, collaboration with Insurtech companies, and fostering ecosystems that amalgamate financial services with healthcare, real estate, and automotive sectors. By synthesizing various business areas with robust technological support, new avenues for insurance market growth can be explored.

Crucial insights that can be derived from Chinese insurance companies include:

- A) Emphasizing investment in the development of new technologies,
- B) Prioritizing the needs of insured individuals,
- C) Cultivating partnerships with other market participants.

Beyond risk insurance, proactive measures in risk prevention form an integral part of an insurance company's remit. A pertinent example is the utilization of the Internet of Things, epitomized by fitness trackers and telematics. These technologies not only inspire clients to modify their behavior positively but also provide insurers with a continuous data stream enabling real-time response, surpassing mere risk insurance to encompass damage prevention and protection of the insured.

Insurance companies possess vast potential to influence risk prevention positively, particularly in an advisory capacity. Examples range from offering guidance to firms on safeguarding against cyber risks, to educating the public on appropriate responses to threats such as natural disasters or epidemics. As prominent institutional investors in financial markets, insurers can steer economic direction with their investment decisions. This influence was demonstrated when large European insurers discontinued insuring coal-fueled power plants and redirected significant capital towards clean technology development.

Although the Serbian insurance market remains underdeveloped, it has shown consistent growth, buoyed by a favorable macroeconomic climate, decreasing unemployment, and rising living standards. Food supply, sustainable land management, and vulnerability to pollution-induced climate disruptions are critical considerations for this region. The concept of sustainable development advocates for a \$100 billion investment to preempt future natural disasters incited by climate change, such as tsunamis, earthquakes, floods, and tropical cyclones. The primary goals include protecting water bodies and reducing their acidity, a consequence of wastewater discharge and industrial air pollution.

However, significant obstacles remain for the Serbian insurance market, which must confront historical constraints and bridge the developmental gap with more advanced regional and global markets. This necessitates substantial state involvement to foster insurance sector development, a sector uniquely poised to stimulate stable growth across the broader economy. Life insurance, particularly deficient in Serbia, plays a crucial role as it amasses vast funds over extended periods, ideal for investment in key projects and infrastructural development. This requires substantial state and insurance company effort in public education about the importance of life insurance and in creating attractive incentives.

Financial market development is also essential to enable more lucrative investment opportunities for insurance funds, and to allow the development of unit-linked insurance products, which amalgamate savings and investment functions. At present, such products are severely lacking in Serbia.

Future research should focus on detailed analyses to bolster institutional and infrastructural capacities for preventing natural disaster risk, necessitating a cooperative approach involving the state, insurance companies,

and individuals. The traditional business model of insurance companies is ill-equipped to navigate modern challenges. The global insurance market's needs call for scrutiny of priority programs and insurance types in alignment with prevailing risks, with an emphasis on cyber risks. The development of the aforementioned insurance must be prioritized, as this risk is set to escalate with further technological advancements.

## Data Availability

The data used to support the research findings are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare no conflict of interest.

## References

- 2020 Asia-Pacific Insurance Outlook-Driving innovation and transformation to seize opportunities and sustain growth. (2019). Ernst & Young. <https://assets.ey.com>.
- A Growing Urgency for Change in the Life Insurance Industry. (2019). Boston Consulting Group, BCG. <https://joaquimcardoso.blog>.
- A History of Insurance in China, Swiss Reinsurance Company Ltd. (2017). Swiss Re Corporate History. <https://www.swissre.com>.
- A History of Insurance in Japan. (2017). Swiss Re Corporate History, Swiss Reinsurance Company Ltd. <https://www.swissre.com>.
- A World at Risk: Annual Report on Global Preparedness for Health Emergencies. (2019). Global Preparedness Monitoring Board, World Health Organization. <https://www.gpmb.org>.
- Arslan, Y., Contreras, J., Patel, N., & Shu, C. (2018). How has globalisation affected emerging market economies? *BIS Paper*, 100b.
- Burns, A., Van Der Mensbrugghe, D., & Timmer, H. (2006). *Evaluating the economic consequences of avian influenza* (No. 47417). The World Bank. <http://www.worldbank.org/gdf2006>.
- Carroll C. M., Evans J. R., Patton, L. E., & Zimolzak, J. L. (2014). *Climate change and insurance*. American Bar Association.
- Central and Eastern Europe: the future's bright in life, *Economic Insights*. (2020). Swiss Re Institute, Swiss Reinsurance Company Ltd., edition no. 2/2020. <https://www.swissre.com>.
- Department of Economic and Social Affairs. (2021). United Nations. <https://www.un.org/en/desa/world-population-projected-reach-98-billion-2050-and-112-billion-2100>.
- Global Nutrition Report. (2021). Food and Agriculture Organization of the United Nations, The World Bank. [https://globalnutritionreport.org/documents/851/2021\\_Global\\_Nutrition\\_Report\\_aUfTRv0.pdf](https://globalnutritionreport.org/documents/851/2021_Global_Nutrition_Report_aUfTRv0.pdf).
- Golnaraghi, M. (2018). Climate change and the insurance industry: Taking action as risk managers and investors. *The Geneva Association, Tokyo, Japan*.
- Golnaraghi, M. (2019). *Sigma No 2/2019*. Swiss Re Institute, Reinsurance Company Ltd. <https://www.swissre.com>
- Golnaraghi, M. (2019). *2020 Global Insurance Outlook: The drive for transformation and growth*. Ernst & Young. <https://www.ey.com>.
- Insurance through leadership*. (2018). Global Trend Map. <https://www.insurancethoughtleadership.com>
- Insurtech 10: Trends for 2019, The Digital Insurer*. (2019). KPMG International. <https://www.the-digital-insurer.com/>.
- Japan's Insurance Market*. (2019). The Toa Reinsurance Company, Tokyo. <https://www.toare.co.jp>.
- Linnerooth-Bayer, J. & Hochrainer-Stigler, S. (2015). Financial instruments for disaster risk management and climate change adaptation. *Climatic Change*, 133, 85-100. <https://doi.org/10.1007/s10584-013-1035-6>.
- Maliszewska M., Mattoo A., & Van Der Mensbrugghe, D. (2020). *The potential impact of Covid-19 on GDP and trade: A preliminary assessment* (No. 9211). World Bank policy research working paper. <https://ssrn.com/abstract=3573211>.
- Mills, E. (2005). Insurance in a climate of change. *Sci.*, 309(5737), 1040-1044. <https://doi.org/10.1126/science.1112121>.
- Natural catastrophes and inflation in 2022: A perfect storm*. (2023). Swiss Re, Sigma 1/2023. <https://www.swissre.com>.
- Pritchett, W. (2019). Insurtech 10: Trends for 2019. *The Digital Insurer, KPMG*, 1-36.
- Sigma explorer*. (2019). Swiss Re. <https://www.sigma-explorer.com>.
- Simpson, M. C., Gössling, S., Scott, D., Hall, C. M., & Gladin, E. (2008). *Climate change adaptation and mitigation in the tourism sector: frameworks, tools and practices*. United Nations Environment Programme (UNEP). <http://www.unep.fr/scp/publications/p>.

- Sustainable Insurance Forum and UN Environment*. (2018). International Association of Insurance Supervisors, Issues Paper on Climate Change Risks to the Insurance Sector, IAIS. <https://www.sustainableinsuranceforum.org/>.
- The future of insurance in Asia-Pacific Navigating InsurTech issues in the Digital Era*. (2020). Osborne Clarke LLP. <https://www.osborneclarke.com>.
- The View: Global insurance market at a crossroads*. (2019). Euler Hermes Allianz Economic Research, Paris. <https://www.allianz.com>.
- Why Chinese Insurers Lead the Way in Digital Innovation*. (2018). Boston Consulting Group. <https://www.bcg.com>.
- World Insurance Report*. (2019). Capgemini & Efma, Paris. <https://www.capgemini.com>.
- Yeung, J. (2006). *The risk of a global pandemic is growing—and the world isn't ready, experts say*. CNN Website. <https://edition.cnn.com>.
- Zečević, A. & Radosavljević, K. (2014). Web-based business applications as the support for increased competitiveness in agribusiness. *Ekonomika Preduzeća*, 62(7-8), 405-418.
- Zeng, L. (2000). Weather derivatives and weather insurance: Concept, application, and analysis. *Bulletin of the American Meteorological Society*, 81(9), 2075-2082. [https://doi.org/10.1175/1520-0477\(2000\)081<2075:WDAWIC>2.3.CO;2](https://doi.org/10.1175/1520-0477(2000)081<2075:WDAWIC>2.3.CO;2).
- Zubor-Nemes, A., Fogarasi, J., Molnár, A., & Kemény, G. (2018). Farmers' responses to the changes in Hungarian agricultural insurance system. *Agr Finance. Rev.*, 78(2), 275-288. <https://doi.org/10.1108/AFR-06-2017-0048>.