INSURTECH AND PRIVATE PENSION INSURANCE IN UKRAINE: HARNESING LIFE INSURANCE INNOVATIONS FOR FUTURE GROWTH

Abstract. The Russian – Ukrainian war has taken a devastating human, economic, and social toll on Ukraine. Entire cities and infrastructure have been destroyed; reconstruction costs will be immense. Providing humanitarian relief and rebuilding vital services is an urgent priority while the war continues. The socioeconomic crisis threatens to reverse decades of development progress. Support from the international community remains critical.

The economic situation in Ukraine has been affected by the war, leading to a decline in living standards for the majority of the population. The ongoing war with Russia has put pressure on the pension system, as the number of people employed in the Ukrainian economy is constantly falling, leading to a lack of pension contributions. A high proportion of the workforce in Ukraine is engaged in informal employment, which makes it difficult to provide adequate pension coverage for these individuals.

Thus, the future of the Ukrainian pension system is uncertain, as the system of solidarity pension insurance is in crisis and requires reforms to address the challenges posed by the changing socioeconomic and political conditions.

To address these challenges, it is crucial to implement innovations and reforms that ensure the long-term sustainability of the pension system, improve coverage for the informal economy, and safeguard adequate levels of pensions in line with international labor standards.

The search results provide information on the economic priorities and challenges in post-war Ukraine, including the pension system and the need for innovations.
Keywords: life insurance, private pension insurance, microinsurance, Insurtech tools, pension innovations, insurance penetration.

Literature review for this paper incorporates insights from various scholars. Becker and Loewe's research on the impact of Insurtech on insurance operations provides valuable perspectives on leveraging technological advancements for enhanced efficiency and customer experience in the insurance sector. Sirojudin and Midgley's work focusing on digital intermediaries sheds light on the evolving role of technology in reshaping insurance market dynamics. Stetsiuk and Pyshchulina's studies on pension provision offer a theoretical foundation for understanding the implications of private pension systems, particularly in rural areas. Tatarina and Kryvoshlyk's contributions to the field of insurance intermediation in the digital economy provide critical insights into the future landscape of insurance services, emphasizing the importance of adapting to technological advancements for sustainable growth and innovation in the industry.

The purpose of the paper is to explore the integration of Insurtech advancements in the realm of private pension insurance in Ukraine. The paper aims to investigate how life insurance innovations can be leveraged to enhance the growth and efficiency of the private pension insurance sector in Ukraine. It likely delves into the potential benefits, challenges, and implications of incorporating Insurtech solutions into the landscape of private pension insurance to drive future development and sustainability in the Ukrainian market.

Results. The OECD reports that the war has slowed down global economic growth, with Europe's economy projected to grow by just 0.3% in 2023 (Jenkins, 2023).

The war has caused a humanitarian crisis, with 8 million Ukrainian refugees recorded in Europe and elsewhere and 6 million Ukrainians internally displaced (Baker et al., 2023). The majority of those displaced are women and children, who are at risk of exploitation and abuse during crises. Millions of civilians in Ukraine are unable to return home and are forced to live without access to food, water, or electricity due to constant shelling. The continued violence across Ukraine is pushing the country further into a humanitarian catastrophe, as hospitals run out of medical supplies and families lose access to food and other essentials (Pistilli, 2023).

According to the National Bank of Ukraine, the annual unemployment rate in Ukraine in 2023 is near 26%, more than double its 2021 average of 10.3% (NBU, 2023).

Using data from the State Statistics Service of Ukraine, the unemployment rate in Ukraine is projected to be around 17.4% in 2024 and 15.00% in 2025 (SSU, 2023).

At the same time, the average salary level in Ukraine is approximately UAH 16,012 (423 USD) per month as of August 2023 (PFU, 2023).

Obviously, the situation with filling up the Pension Fund of Ukraine is challenging. The system of solidarity pension insurance in Ukraine is in crisis, and its future is uncertain.
Together with the economic, the demographic changes in Ukraine seriously affect public finances, especially the pension system. In 2030, the labor force will decrease from 17.4 to 11.7 million. According to researchers, the population of Ukraine in 2023 will be about 31.2 million people, including 5.8 million refugees and those who left for Russia.

The labor force in 2023 is estimated at 12.5 million people, down from 17.4 million in 2021. This decline reflects 2.5 million refugees of working age, 1 million mobilized to the army, and 1.4 million additional unemployed.

Under the inertia scenario, which takes into account natural decline, refugee returns, and migration, Ukraine's population will reach 31.8 million in 2024-2032. The labor force is estimated at 11.7 million people over the same period, taking into account natural decline, refugee returns, and additional migration. This includes 1.45 million returning refugees, based on surveys showing that 50% of them want to return.

Apart of this, Ukraine is facing a rapid aging of its population, with a significant increase in the share of elderly people. By 2050, the share of people aged 60 and older is expected to reach 32%. In 2021, there were 10.9 million pensioners in Ukraine. According to forecasts, by 2032 the number of pensioners will reach 12.2 million due to population aging. Thus, there will be fewer working people in the country than pensioners (KSE, 2021).

As of October 2023, there were about 11 million pensioners in Ukraine, with the average pension being UAH 4,539 (120 USD). The system of solidarity pension insurance in Ukraine is facing challenges due to the aging population and the decrease in the working-age population, which affects the number of Single Social Contribution payers (Pyshchulina, 2023).

As shown in the table, 66% of Ukrainian pensioners receive a pension below 120 €, of which 50.5% receive a pension below 100 €.

Table 1

<table>
<thead>
<tr>
<th>Pension amount, €</th>
<th>Number of pensioners receiving such pension, %.</th>
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<tbody>
<tr>
<td>up to 48</td>
<td>0.6</td>
</tr>
<tr>
<td>48-70</td>
<td>29.1</td>
</tr>
<tr>
<td>71-95</td>
<td>21.3</td>
</tr>
<tr>
<td>95-120</td>
<td>14.9</td>
</tr>
<tr>
<td>120 - 240</td>
<td>23.2</td>
</tr>
<tr>
<td>more than 240</td>
<td>10.9</td>
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</table>

Source: created by the author according to the Pension Fund of Ukraine.

One of the ways to overcome the pension crisis is to focus on the 3rd pillar of pension system of Ukraine, namely life insurance, one of the types of which is supplementary pension insurance.
The pension system in Ukraine operates with a three-pillars provision system, as specified by the Law of Ukraine on Compulsory State Pension Insurance. The system consists of the following pillars:

First pillar is based on solidarity and subsidizing principles. Pensions are assigned when individuals reach the pension age, or in the case of disability or loss of the breadwinner. The system is funded by contributions from employees, entrepreneurs, the self-employed, and others, which amount to 22% of the salary - Single Social Contribution. The contributions are received by the Pension Fund of Ukraine, which is responsible for the state pension. The fund uses these contributions to pay pensions to current retirees. Additionally, retirement savings can be inherited and are in addition to the solidarity system.

Second pillar involves the accumulation of retirement savings and is funded by mandatory contributions from employees and employers. The accumulated funds are managed by private pension funds.

Third pillar involves voluntary private pension provision, based on the principles of voluntary participation of citizens, employers and their associations in the formation of pension savings in order to provide citizens with pension payments that will supplement pensions from Pillars I and II.

Employees are given the opportunity to increase the amount of their future pension by making additional payroll deductions to a private pension fund or other entity of the third pillar of the pension system of their choice.

The second pillar of the pension system in Ukraine has not yet been implemented. The Ukrainian government developed a draft law to introduce a mandatory funded pension pillar in 2018, but it has not been implemented yet. (The Government’s 2020 Priority Action Plan, 2020). The International Labour Organization has recommended that Ukraine should act with caution on introducing the mandatory funded pensions, and it is not recommended that Ukraine introduce a second pillar system under the current circumstances (ILO, 2020).

Therefore, the current pension system in Ukraine operates with a two-pillared provision system, consisting of the first pillar based on solidarity and subsidizing principles and the third pillar involving voluntary private pension provision.

The pension system in Ukraine faces various challenges, including a chronic deficit of the Pension Fund, insufficient social security coverage, low pension payments, and a high level of involvement in the shadow economy. The demographic situation in Ukraine, characterized by high premature mortality and low life expectancy, further complicates the design and implementation of pension reform.

For this reason, in our article we will ignore the first two pillars of pension provision and focus on the third, which is currently in operation, life insurers enter into contracts with their clients, and policyholders can receive additional pension payments.
It should be noted that the Ukrainian definition of supplementary pension insurance, i.e., the entry into a contract with an insurance company, is largely in line with European investment insurance. Therefore, when talking about supplementary pension insurance, the authors mean investment insurance.

Insurance companies play an important role in improving the living standards and social protection of pensioners in Ukraine. Their products and services help improve the financial situation of the elderly. Below are some key points on how concluding insurance contracts with life insurers can affect the financial situation of future pensioners:

- they provide an additional source of retirement income in the form of payments under life insurance contracts, which helps to improve the standard of living of retirees;
- allow you to save for retirement in advance, which ensures financial stability in old age;
- they offer various investment and savings programs that allow to increase retirement savings;
- provide payments in a case of insured events (survival to a certain age, disability, etc.), which improves the protection of pensioners;
- offer a variety of additional services (medical care, travel insurance, etc.) for pensioners.
- make payments to the heirs of clients, which ensures social protection of pensioners' families.

We believe that such benefits are very useful for such vulnerable groups as pensioners, whose only means of living are pensions. It's no secret that retirement actually makes people poorer. In developed European countries, such as France – 72%, Italy – 82%, Netherlands - 90%, the ratio of wage replacement by pensions is high (OECD, 2024). This is a rather high figures, but at the same time, it means that when a person retires, he or she is 10-20% or more poorer, meaning that he or she can afford much less than he or she could afford while receiving a salary. In Ukraine, this figure is much lower. In the pre-war period, the value of this coefficient in Ukraine ranged from 33 to 38%, although according to ILO recommendations, it should not be lower than 40%.

For the development of any economic system, the introduction of innovations and legislative reform of the relevant market of the country are of paramount importance. Now we would like you to pay attention on the recent legislative changes that have taken place in the Ukrainian insurance market.

According to the National Association of Insurers of Ukraine, the total number of life insurance companies in Ukraine as of September 30, 2023 amounted to 12 (NAIU, 2023), all of them in their portfolio, have supplementary pension (annuity) insurance.
Table 2

<table>
<thead>
<tr>
<th>№</th>
<th>Insurer</th>
<th>Premiums, thous. €</th>
<th>Growth rate, %</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Metlife</td>
<td>41 138</td>
<td>14.3</td>
</tr>
<tr>
<td>2</td>
<td>TAS</td>
<td>9 646</td>
<td>8.5</td>
</tr>
<tr>
<td>3</td>
<td>PZU Ukraine Life Insurance</td>
<td>6 839</td>
<td>-2</td>
</tr>
<tr>
<td>4</td>
<td>UNIQA Life</td>
<td>6 144</td>
<td>-21</td>
</tr>
<tr>
<td>5</td>
<td>ARX Life</td>
<td>5 588</td>
<td>18.7</td>
</tr>
</tbody>
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Source: https://forinsurer.com/ratings/nonlife

But as of November 2023, and the second year of full-scaled war, none of them has introduced special innovative products and tools to the insurance market that would help, on the one hand, protect the lives and health of policyholders and, on the other hand, increase the pool of policyholders for the insurance company. The situation changed even more with the beginning of Russia's full-scale invasion of Ukraine. Amid panic in the society, unemployment crisis, and destruction of infrastructure, people started withdrawing their funds from insurance companies and stopped making regular contributions, which further slowed down the development of voluntary pension provision.

For these reasons, among others, but not exclusively, the number of life insurers that provide the third pillar of the pension system is declining every year. Figure 1 shows the changes in the share of life insurance companies in the market in the total number of insurers in 2015-2022.

Fig. 1 Share of life insurance companies in the total number of insurers in Ukraine, 2015-2022, %.

Source: compiled by the author based on Forinsurance.

Some financial analysts point out that companies whose capitalization level does not meet the established standards or that were not engaged in "classical" insurance usually cease to operate in the market. Weak players are leaving the market, which contributes to its consolidation and reduces the share of companies that do not conduct active and efficient insurance activities.
Therefore, the reduction in the number of insurers should not be viewed as an exclusively bad thing, as it was also facilitated by the effective work of the Regulator, which may increase confidence in insurance services in the future.

In our opinion, it is already necessary to restructure the relations between insurance entities. On January 1, 2024, a new version of the Ukrainian Law on Insurance came into force. This new law is the part of the ongoing transformation and European integration of the Ukrainian insurance market, aiming to enhance consumer protection and ensure the long-term sustainability of the insurance market in Ukraine.

The law aims to modernize the existing regulation of insurance services in Ukraine, particularly in line with EU Directive 2009/138/EC and the Insurance Core Principles of the International Association of Insurance Supervisors.

The new law substantially revises and updates the requirements for the activities of Ukrainian insurance companies, including the conduct of business rules, insurance contract execution and performance requirements, management system requirements, solvency and investment activity requirements, etc.

This might refer to the strengthening regulatory oversight, ensuring that the life insurance sector is effectively regulated and supervised by relevant authorities to maintain stability and protect the interests of policyholders (ILO, 35-36, 2019).

However, Ukrainian legislation concerning long-term insurance does not explicitly refer to EU directives. Yet, Ukraine is working towards aligning our legislation with the relevant EU acquis and EU case law. The country has made progress in adopting the payment services law in 2021, which came into force in August 2022, and is an important step towards alignment with the EU acquis in the area of payment services (EU, 2023).

As of the European Commission Report published in February 2023 which assesses Ukraine's application for EU membership, it acknowledges Ukraine's European aspirations and ongoing reforms, but notes substantial work still required to align with EU standards. Among key challenges identified strengthening rule of law, judicial reform, and other.

In the context of long-term insurance, Ukraine has not explicitly mentioned any EU directives in the search results. However, it is essential to note that the country is at an early stage of preparation in the free movement of workers and will need to align its legislation in a comprehensive way with the relevant EU acquis and EU case law. This may include adopting and implementing EU directives related to long-term insurance and other financial services.

Along with legislative innovations there are other ways to introduce innovations and modernization the life insurance sector in Ukraine as part of the broader reform of the pension insurance system. This could involve:

1. Increasing the use of technology: leveraging insurtech tools to improve efficiency, reduce costs, and enhance customer experience in the life insurance sector.
2. Expanding product offerings: offering a diverse range of life insurance products to cater to different customer needs and preferences, including investment plans, term life insurance, and whole life insurance.

3. Improving customer service: enhancing customer service and support to ensure a positive experience for policyholders, including online platforms, mobile apps, and dedicated customer service channels.

4. Promoting financial literacy: encouraging financial education and awareness among the population to help them make informed decisions about life insurance products and better manage their financial resources.

Leveraging insurtech tools to improve efficiency, reduce costs, and enhance customer experience in the life insurance sector can be exemplified in the context of pension insurance. Insurtech innovations such as artificial intelligence (AI), big data analytics, and digital platforms can be utilized to streamline pension insurance processes, enhance risk assessment, and provide personalized services to policyholders.

For instance, AI and machine learning algorithms can be employed to analyze vast amounts of data to identify patterns, assess risk, and personalize pension plans based on individual needs and preferences. This can lead to more accurate risk assessment, improved underwriting processes, and tailored pension products that better meet the needs of policyholders. Furthermore, digital platforms and mobile applications can be utilized to provide policyholders with easy access to their pension accounts, real-time updates on their investments, and personalized financial planning tools. This can enhance customer engagement, improve transparency, and empower individuals to make informed decisions about their pension savings.

At the same time, data can be used to segment customers into different groups based on their behavior and characteristics. This can help Insurtech companies tailor their products and services to meet the specific needs of different customer segments.

Additionally, the use of blockchain technology can enhance the security and transparency of pension insurance transactions, ensuring the integrity of policyholder data and streamlining administrative processes. The digitization of contracts in Insurtech refers to the transformation of traditional, paper-based insurance contracts into digital formats. Using technology to digitize insurance contracts can make them easier to manage and understand. A “smart” contract is a blockchain-based insurance contract that pays out when certain predefined conditions have been met. They are transparent, data-driven, and comparable to parametric insurance contracts. Because smart contracts exist in a decentralized space, they are tamper-proof and secure.

Thus, by leveraging these insurtech tools, the pension insurance sector can enhance operational efficiency, reduce administrative costs, and deliver a more
personalized and engaging experience for policyholders, ultimately contributing to the modernization and transformation of the pension insurance industry in Ukraine.

In the context of pension insurance, expanding product offerings could involve providing a diverse range of life insurance products tailored to different customer needs and preferences. For example, life insurance companies can offer a variety of pension plans that cater to individuals' retirement goals and risk tolerance. As an example, the plans that offer individuals the opportunity to grow their retirement savings through various investment vehicles, such as mutual funds, stocks, and bonds. These plans can provide flexibility and potential for higher returns, aligning with the long-term nature of pension savings.

Apart of it, life insurance companies can offer Term or Whole Life Insurance. On the one hand, coverage for a specified period, offering financial protection to individuals during their working years. These products can be tailored to complement pension plans, providing additional security for individuals and their families. On the other hand, lifelong coverage and accumulate cash value over time. These products can be structured to provide a source of supplemental income during retirement, enhancing the overall financial security of individuals.

By offering a diverse range of life insurance products, including those specifically designed to complement pension planning, life insurance companies can better address the evolving needs of individuals preparing for retirement. This approach aligns with the industry's focus on developing flexible product solutions suitable for a challenging regulatory and interest-rate environment, as well as the goal of helping customers live longer, healthier lives.

At the same time, the spread of private pensions can be seen as an indicator of financial literacy of the population. It depends heavily on individuals having the financial knowledge and capability to assess their benefits and make informed decisions about retirement planning. Uptake of private pensions also depends on awareness and understanding of their benefits for retirement income. Lack of financial literacy is a key barrier to broader participation in pension schemes in many countries. According to OECD data, voluntary private pension coverage ranges from over 90% in some Nordic countries to less than 10% in some eastern European countries. This variation reflects differences in financial literacy.

Financial literacy programs aimed at improving understanding of compound interest, risk diversification, pension system design and long-term retirement planning have been shown to increase private pension membership. Public policy can encourage private pensions by making enrollment the default option for workers, providing matching contributions, and introducing tax incentives for savers. However, these need to be combined with financial education. Young people with higher financial literacy are more likely to begin contributing early to supplementary pensions, underscoring the importance of improving youth financial education.
In case of Ukraine, according to the report assessed the state of financial literacy and inclusion in Ukraine based on an OECD survey, conducted in 2020, financial literacy in Ukraine is relatively low - 37% of adults were assessed to have low financial knowledge. This is below the average for OECD countries. However, 78% of adults in Ukraine were financially included, having access to basic financial services like bank accounts of insurance. This rate is similar to other OECD countries.

The report found gaps in financial literacy for women, older adults, those with lower education levels, and unemployed individuals in Ukraine. Only 19% of adults in Ukraine were assessed to have high financial literacy, suggesting significant room for improvement.

The National Bank sees improved financial literacy and inclusion as crucial for increasing welfare and supporting economic development in Ukraine (NBU, 2021).

While the search results do not provide specific information on the impact of the Russian-Ukrainian war on private pensions, it is clear that the conflict has had a significant impact on the Ukrainian economy and society. As of The World Bank In Ukraine, the human costs of the conflict are: more than 8 million displaced across European countries, near 5.4 million internally displaced. The proportion of Ukrainians living in poverty increased from 5.5 % to 24.1 % in 2022 (World Bank, 2022).

Therefore, the need for financial inclusion of Ukrainians is becoming increasingly important. The question arises as to how all these forcibly displaced persons will have access to information on how to improve their financial situation when they reach retirement age. To address this issue, in our opinion, it would be appropriate for domestic insurance companies to use the capabilities of artificial intelligence, namely:

• sentiment analysis of social media posts to understand concerns and barriers Ukrainian refugees may face in continuing pension contributions. It can be utilized in the context of private pension schemes to gauge public sentiment and attitudes towards retirement planning, investment options, and financial security. By analyzing social media and other online content, pension providers can gain insights into the public's perceptions and concerns, which can inform the design of more targeted and effective communication strategies, investment products, and customer support services.

• biometric authentication for identity verification to facilitate pension access for displaced Ukrainians without all required documents.

• predictive analytics to forecast long-term pension benefits and income stability to aid Ukrainian refugees’ financial planning during uncertainty of war.

• micro-targeting displaced Ukrainians with personalized information on host country pension options and financial planning.

Globally, life insurance products are in an expensive service segment. But our task at the present stage is to provide comprehensive care and coverage of the
vulnerable population of Ukraine with pension insurance. Micro-insurance programs for life, health and pensions can be an alternative to expensive insurance.

This concept can be realized for life and disability insurance and even, under certain conditions, for pension insurance and insurance that gives protection against the effects of the weather and natural disasters, provided that professional insurers assume responsibility for product design and risk management, but cooperate in product marketing and customer servicing (Loewe, 2010).

Exploring the possibilities of introducing microinsurance products in the segment of life and pension insurance is of particular importance in the context of permanent reforming of the pension system, the economic collapse in which Ukraine is currently experiencing due to the war with Russia, a constant increase in the level of insecurity of the population, unemployment, etc. The introduction of such options at the third level of the pension system is appropriate right now and is beneficial for all stakeholders: for the state - in terms of its social protection functions; for insurers - to fulfill the functions of social responsibility and reduce the burden on the state budget; for insurers - fulfillment of social responsibility and reduction of the burden on the state budget, for households - reduction of social tension and increased confidence in the future (Dymnich et al., 2023).

As defined by the IAIS, "microinsurance is not a specific product or product line provided exclusively by one insurer with limited access. It is the provision of coverage to a specific entity - in our case, low-income individuals. And it is not just a scaling of classic insurance, such products must be completely updated and meet the specifics of the market with low consumer income (ILO, 2007). Such products are of particular importance for our population, as our country is characterized by low incomes due to the war, and thus high inflation, consumer prices and general impoverishment of the population.

In the case of long-term life insurance, such products help policyholders save for education, weddings, funerals, or can be considered as investments in old age at the third pillar of the Ukrainian pension system. The impact on insurance premiums of factors such as inflation, high living costs in the current economic environment, and insufficient investment opportunities limit the value of such instruments, especially for low-income policyholders.

Here is the example of most successful application of microinsurance products in developing countries. Currently, microinsurance providers worldwide offer 4 main types of insurance: life, health, accidental death and disability. Due to the relative ease and affordability of providing life insurance, it is the most widely distributed product. Conversely, providing health insurance is particularly difficult, due to high expenses attached to claims handling and incidences of fraud. The main developing countries where microinsurance has been introduced are Indonesia, India, African countries, and Mexico. In this countries microinsurance in filling the gap in government action and strengthening risk management capacities for
vulnerable population. The most known is Social Welfare Insurance Program (SWIP) – the government-led microinsurance program in Indonesia. SWIP appears to be an insurance program designed to provide social protection, particularly to workers in the informal sector and other vulnerable groups. The program likely aims to offer coverage against various risks, such as illness, disability, and death, and may include provisions for retirement savings plans. SWIP is a part of a broader effort to extend social security coverage to individuals who may not have access to traditional social protection schemes.

SWIP was initiated and supported by the Ministry of Social Affairs of the Republic of Indonesia since 1996, and it formalizes community-based social security activities that are already implemented by Community-Based Organizations (CBOs) through providing more structured administrative and organizational mechanisms. SWIP facilitates greater involvement of local-level CBOs in social protection and is effective in reducing the risks and vulnerabilities of its members, although the amount of benefits (sickness, injury, and survivor) is considered inadequate. The challenges faced in implementing microinsurance programs, such as client education, product design, and efficient delivery channels, are also relevant to SWIP. Overall, SWIP is an example of a successful microinsurance program in private pension insurance that provides social protection to vulnerable populations in developing countries (Sirojudin, 2013). As of Statista, in Indonesia, approximately 21.8 million people were covered by microinsurance by the end of 2021, decreasing from over 28.3 million (approx. 10% of population) in 2020. In that year, the number of persons covered declined as the number of new businesses in Indonesia decreased, and some companies discontinued selling microinsurance products (Statista, 2023).

In our opinion, it would be useful for Ukraine to apply the experience of Indonesia in the context of involving the labor force in expanding pension opportunities. In this case, we believe that it is appropriate to apply the mechanisms of behavioral finance theory, such as the use of the "default" option when concluding an employment contract. Behavioral finance is based on the premise that humans are rational beings and make rational decisions. In real life, we see that this is not the case. Decisions are made with difficulty or are postponed indefinitely despite the obvious benefit to the person. The "default" options in an employment contract are designed to connect an employee to an existing pension plan that the employer has, such as a collective private pension insurance agreement concluded with an insurance company. This provides the individual with an additional pension.

In order to assess and increase the involvement of potential consumers in life insurance, and thus in supplementary pension insurance, it is necessary to note the degree of its penetration. This indicator in Ukraine is disappointingly low (Figure 2).

The insurance penetration rate is calculated as the ratio of gross insurance premiums to the country's GDP, i.e., it shows the number of insurance premiums per capita.
Over the past years, the share of gross life insurance premiums in GDP has not exceeded 0.14%, and its average figure is 0.12%. In developed countries, this figure is never less than 1% (for example, in Poland - 3%).

Therefore, in order to reverse these disappointing indicators, the life insurance market in Ukraine needs to introduce certain innovations, which, in our opinion, make sense to introduce in the post-war period.

Another innovative tool that can be implemented within the frame of pension insurance are digitalized products. Digitalization of the insurers’ services will increase the volume of voluntary pension provision, as it encourages a new younger audience of 20-30 years old, whose share among depositors is still low, and increases the availability and speed of obtaining such a service. Many Insurtech companies are developing user-friendly online platforms and mobile apps that enable customers to easily compare insurance products, obtain quotes, purchase policies, and manage their coverage digitally. Technologies such as optical character recognition (OCR), natural language processing (NLP), and machine learning are being used to automate various aspects of the claim management process, including claims intake, validation, and settlement.

By utilizing AI and advanced analytics to analyze customer data, insurance companies can provide tailored insurance products based on individual needs and risk profiles. These insurtech tools are being used to analyze customer data and create more finely delineated groupings of risk, allowing products to be priced more competitively.

One example of using insurtech tools in pension insurance is the use of robo-advisors to provide personalized investment advice to pension plan participants. Robo-advisors use algorithms and machine learning to analyze an individual's financial situation, risk tolerance, and retirement goals to provide tailored investment recommendations. This approach can help individuals make informed investment decisions and optimize their retirement savings. But at the same time, it raises a number of issues, including ethical issues, personal data protection, cybersecurity, etc. Data and analytics are heavily used by insurance companies to create personalized policies and improve risk management. However, data privacy is a major concern for consumers, and companies must take steps to ensure that data is collected and used responsibly and ethically.
As of report of OECD, there are several drawbacks to the use of robo-advisors:
- robo-advice platforms have the potential to increase accessibility of investing to a broader market and to do so relatively more cheaply than through the traditional channels.
- they have the potential to deliver financial advice that is objective, consistent and transparent.
- however, the increased level of automation may require different approaches to ensure that the users have a sufficient level of understanding of the investments they are making.
- policy makers will need to ensure that existing legislation applies to robo-advisors with respect to the applicability of duty of care requirements, avoidance of conflicts of interest, transparency of disclosure and access to redress in the case of an unfair outcome for the consumer.
- regulators and supervisors will need to have processes in place to ensure that the algorithms that these platforms use are accurate and robust (OECD, 2017).

It should be noted that the use of robot platforms is not regulated by Ukrainian insurance legislation. Each platform with all its pros and cons is created by the insurance company itself. It is also responsible for the leakage of personal information. And since the office of the insurance ombudsman in Ukraine is also not functioning, the insured has no place to apply for protection of their rights as consumers of insurance services. Still, it is necessary to take into account the latest trends and future forecasts regarding the use of robot platforms in the service markets. According to the forecast period from 2022 to 2030, the global robo-advisory market is anticipated to grow reaching USD 42.89 billion.

Another example is the use of blockchain technology to enhance the security and transparency of pension insurance transactions. Blockchain can provide a secure and tamper-proof record of pension contributions, investment returns, and payouts, ensuring the integrity of policyholder data and streamlining administrative processes. The use of smart contracts in pension insurance can bring several benefits, as indicated by the provided sources. Smart contracts are self-executing programs that automate the actions required in an agreement or contract between two or more parties. They are stored on a blockchain, which ensures their security, reliability, and accessibility. Smart contracts work by monitoring the blockchain or other credible information sources for certain conditions or triggers. Once the predetermined conditions are met, the smart contract is executed, and the results are recorded to the blockchain. Smart contracts can make pension transactions optimized, automated, and error-free, thus improving the efficiency and accuracy of pension processes. They can also improve the capability and level of existing pension products and services, providing technical support for innovation in pension insurance products and services. Smart contracts can contribute to improving decision-making about pensions by providing an autonomous pension scheme in the blockchain and
autonomous asset management in the blockchain, thus potentially enhancing the management and performance of pension assets. Smart contracts can also be used for governance and management purposes, such as managing the types of tokens a pension pot offers to its members. A governance token can be used for trustees to vote on which tokens to add or remove from the investment options. The smart contract can also be used to deduct fees for managing the pension scheme.

However, it is important to carefully consider regulatory aspects and risk management when implementing smart contracts in pension insurance. The European Insurance and Occupational Pensions Authority has published a discussion paper on blockchain and smart contracts in insurance, inviting stakeholders to provide their views on the risks and benefits of blockchain and smart contracts use cases in insurance, as well as regulatory barriers and possible European approaches to blockchain developments in the insurance industry (EIOPA, 2021).

The utilization of smart contracts, crypto tokens, and crypto wallets presents intriguing possibilities. Through smart contracts, crypto tokens can be generated, transferred between wallets, and even eliminated. Each wallet has the capacity to contain one or multiple types of tokens. Furthermore, tokens can also function as governance tokens, enabling smart contracts to execute specific actions if the majority of governance tokens vote for such actions. When applied to pension scheme management, each individual scheme member possesses their own wallet, where all their investments are stored. The concept of “Multi-Signature” ( multisig) allows for the establishment of different rules regarding wallet access. For instance, both the member and the trustee may be required to sign in order to transfer funds out of the wallet. Currently, members hold participations in investments in the form of units that are purchased. Each unit has an associated unit price. By substituting participations/units with an investment in crypto tokens, it is possible for each investment fund to emit its own crypto tokens. When an employer makes a contribution on behalf of an employee, the funds are converted into the tokens of the employee’s chosen investment(s), and these tokens are then transferred to the employee's wallet. The employee can determine the value of their pension pot at any given time by multiplying the price of the tokens by the quantity of tokens held. The use of a smart contract can be employed to manage the types of tokens offered by a pension pot to its members. A governance token can be utilized to enable trustees to vote on which tokens should be added or removed from the investment options. Additionally, the smart contract can be utilized to deduct fees for managing the pension pots. The transfer of funds from one provider to another can also be facilitated via a smart contract. The multisig option can enable a transfer in which the employee, together with the old and new pension provider, sign to indicate that the wallet is now managed by the smart contract from the new pension provider and no longer by the old pension provider. The old/new pension provider can have fully automated processes to convert tokens from one investment type to another, should they not support the old tokens.
In the context of pension insurance, enhancing customer service and support can be achieved through the implementation of various digital solutions and self-service tools. These tools can provide policyholders with convenient access to information, streamline processes, and improve overall customer experience.

Until recently, when customers need to find customer support, they had to go to the insurance company’s office. Today, the “customer journey” is going digital and getting simpler at the same time. Whatever their need, policyholders can now count on the same level of good customer service but remotely (Gallemard, 2022).

Streamlined transactions simplify pension-related transactions, such as contribution management, fund transfers, and beneficiary updates. These tools can streamline administrative processes and empower policyholders to manage their pension accounts efficiently (PBGC, 2020).

In order to make the use of these insurtech tools in pension insurance more likely, we need to improve the financial literacy of potential consumers of insurance services. While 20–30-year-olds, as mentioned above, are clear, fast, and interested in digital innovations, they may have problems with fundamental knowledge of financial science. With people aged 50+, these two aspects are more difficult to deal with. According to psychologists, the ability to learn naturally decreases in older people. In addition, the services of insurance companies are subject to passive demand in Ukraine, and such investments are not trustworthy and therefore not widely popular among the population.

The need to improve the insurance culture, financial literacy of the population as well as innovative tools to involve them into, are one of the important areas for intensifying pension insurance in general. After all, in the process of pension reform, the state pays very little attention to social advertising and explanatory work with the population on the pension reform itself. This, in turn, leads to ignorance and insufficient understanding of the meaning and content of pension provision, as well as the possibility of obtaining benefits and advantages that are available to the population through the use of non-state pension programs.

One of the indicators in the analysis of voluntary pension provision is the dynamics of insurers’ investment income. In many developed countries, insurance companies exceed classical institutional investors, such as banks and investment funds, in terms of investment investments. Insurance companies typically invest in the following: government bonds; bank deposits; corporate bonds; real estate; shares of large companies etc.

The decline in investment income in Ukraine is generally due to political and economic instability, as interest rates on government bonds have fallen since the start of the full-scale invasion, and the banking system has been exposed to financial risks. Currently, the most reliable investment vehicles in Ukraine are government debt securities (so called, war bonds) and bank deposits. However, investing in government securities is not the best use of pension savings, as the bulk of the funds...
raised by the government is used mainly to implement social programs or finance other unproductive expenditures, meaning that it does not actually cover inflation losses. Especially now, during the war, interest rates on domestic government bonds have dropped significantly.

Therefore, it is more innovative and promising from the point of view of both the country's socio-economic development and profitability to invest in the real sector of the economy, create new jobs, i.e., to use funds productively for purposes that provide for economic growth; investing in the development of start-ups, small and medium-sized businesses that have suffered the most and continue to suffer during the war.

To give an example of more global areas of investment of insurance companies' funds, we see them as follows: ongoing investment in industrial production, a focus on post-war reconstruction and green modernization, and efforts to provide investment insurance against war risks.

Despite the actual war, there are indications that global industrial giants and Ukrainian enterprises are investing in the development and modernization of production facilities in Ukraine, particularly in sectors such as mining, steel, and heavy industry (Acelor Metal, MetInvest, Bayer, Amsted Rail etc). These huge enterprises operating during the war with a large number of employees. They may require direct participation of insurers in personal insurance and, in particular, in pension insurance. We also see an opportunity for insurers to invest in a particular production.

There is a recognition of the need for post-war reconstruction and the modernization of Ukraine's industrial and manufacturing base. With regard to the extensive war damage to infrastructure, the creation of modern, low-carbon industrial infrastructure should be a key priority for support from both the Ukrainian government and international donors and investors. The government is encouraging potential investors to apply for state support for investment projects with significant investments in Ukraine, particularly those focused on green modernization and the transfer of modern technologies. So, there’s an opportunity for the insurers to invest in green economy development (UkraineInvest, 2024).

It is well known from economic theory that an investor agrees to invest money only when the potential return exceeds the risk of losing it. Ukraine has become a hostage to this theory. Potential private investors see it as a continuous battlefield, where a russian shell or missile could destroy their projects at any moment, causing irreparable damage. The Ukrainian government has adopted a law on the insurance of investments in Ukraine against war risks. This is aimed at attracting domestic investors and supporting the Ukrainian economy by providing insurance against war and political risks. So, under this legislative umbrella, Ukrainian insurers can invest in mentioned above.
Conclusion. Political changes in the country, such as Russia's military aggression in 2014 and its full-scale invasion of Ukraine in 2022, have a direct impact on the entire economic situation in the country, and thus on the entire pension system and the operation of all financial institutions. The Covid-19 crisis has also been a major shock to the global economy, as well as to Ukraine's.

These political and social changes have resulted in the loss of a large number of jobs, lower incomes, the closure of many small and medium-sized enterprises, and the loss of many solvent people of working age - all of which have a direct and proportional impact on the current situation and future development of voluntary pension provision.

The following suggestions can be made to improve the pension provision among the population: a) expand sales of services; b) inform potential consumers through advertising projects; c) introduce bonuses and additional benefits for clients; and d) develop a microinsurance system.

The following measures can be taken by the Regulator to improve: ensure high standards of consumer protection at the legislative level; formulate a strategy for the development of the insurance market, reform of the pension system, taking into account global trends and simultaneously create conditions for the development of the stock market, as it is interconnected with private pensions; provide state guarantees for the receipt of insured funds in the event of an insurance company's bankruptcy (the Payment Guarantee Fund) etc.

On the role of insurance companies: to introduce new channels of service sales and customer service; to develop the latest, most relevant products and improve existing ones; to provide training opportunities for the qualifications most involved in life insurance (especially actuaries and underwriters); to expand sales of corporate programs; to provide targeted investment.

References:


