DEEP
KNOWLEDGE
GROUP

Longevity Financial Industry Framework

Longevity Financial Industry Framework

Longevity Investment Organizations

- Longevity Companies
- Longevity-Focused VCs
- Longevity-Focused Family Offices
- Private Equity Funds
- Hedge Funds
- Accelerators and Incubators

Longevity WealthTech and Asset Management

- Novel Retirement Plans and Robo-Retirement
- Investment Banks and Asset Management Corporations
- Digital Brokers
- New-Gen AI-Driven Portfolio Management
- AI-Driven Advisory Services
- Micro-Investments

Longevity FinTech

- Age-Friendly Banks
- Healthy Lifestyle Bonuses
- Longevity Credit Unions
- Providers of Reverse Mortgage for the USA
- Retiree Employment
- Providers of Equity Release for Europe

Longevity Insurance and InsurTech

- InsurTech Marketplaces and Platforms
- Life Insurance and InsurTech
- Disability Insurance and InsurTech
- Health Insurance and InsurTech
- Big Data Actuarial Models and AI-Driven Premium Calculation
- IoT InsurTech (Wearables)
- Wealth Insurance and InsurTech
- Automated Claims Management

Bridge Solutions to Neutralize Longevity Risk Impact

- Longevity Risk Reinsurance
- Longevity Risk Transfer
- Actuarial Consulting Firms
- Longevity-Enhanced Annuities (QLACs)
- Pension Derivatives
- Underwriters (Banks and Asset Managers)

Longevity Securitization

- Securitization Service Providers
- Derivatives Providers
- Government Bodies
- Clearing and Settlement Services
- Trust Companies
- Rating Agencies

Longevity Risk-Exposed Organizations

- Corporate and Independent Pension Funds
- Public (State) Pension Funds
- Annuity Providers
- National Healthcare Budget
- Healthcare Providers

Novel Longevity Financial System (*Concepts*)

- Longevity Investment Bank
- Longevity Stock Exchange
- Longevity Innovation Marketplace
- Longevity Biomarkers for De-Risking
- Longevity Exchange-Traded Fund
- Biological Age-Based Insurance
- AgeTech-Friendly NeoBanks
- Longevity Rating Agency

DEEP KNOWLEDGE GROUP

Longevity Financial Industry Framework Subsegments Short Summary

Longevity Investment Organizations

Longevity Companies

- Includes entities related to scientific research into aging and its diseases, as well as synergies between multiple sectors.
- Longevity start-ups are maturing and becoming more prevalent, with large institutional investors increasingly investing in the industry and a full-fledged emerging infrastructure.

Longevity-Focused VCs

- Among several thousand investment funds in the Longevity Industry space, venture capital funds that focus mainly on Longevity companies are the leading funding institutions.
- These funds aim to accelerate breakthroughs in different areas of Longevity and make them more widely available and affordable.

Longevity-Focused Family Offices

- High net worth individuals (HNWIs) and family offices have a significant interest in the industry of radical life extension.
- They are actively seeking ways to invest in and benefit from breakthroughs in the field of Longevity.

Private Equity Funds

- Private equity funds of various types, such as growth equity, buyout, and mezzanine funds, have a strong interest in the radical life extension industry.
- Private equity funds play a critical role in providing the capital and resources needed to support the growth of companies, as well as in bringing cutting-edge Longevity solutions to the market.

Hedge Funds

- Hedge funds aim to benefit from breakthroughs in the field of Longevity and provide capital and resources to support growth of Longevity companies.
- Longevity companies offer hedge funds diversification benefits and high returns potential; the Longevity Industry is relatively uncorrelated with other sectors.

Accelerators and Incubators

- Accelerators and incubators provide start-ups with access to resources and mentorship to help them develop their products and grow their businesses.
- Many accelerators and incubators are also motivated by the social impact of investing in Longevity start-ups as they can help to improve the quality of life for people globally.

Longevity WealthTech and Asset Management

Novel Retirement Plans and Robo-Retirement

- Innovative solutions related to retirement plans, such as those offered by robo-advisors.
- Robo-advisors can help predict retirement goals by the target date and recommend ways to get back on track if needed.

Investment Banks and Asset Managers

- Integrated solutions in health and personal finance management.
- Nonbiomedical components in achieving practical outcomes in Healthy Human Longevity.

Digital Brokers

- Online platforms and software tools provide easy access to stock market information and investment opportunities.
- Finance apps that make stock markets and innovative tools more accessible to a wider consumer base.

New-Gen AI-Driven Portfolio Management

- Enhanced experience to investors.
- Interest across older age groups.
- Better performance than human-managed portfolios.

AI-Driven Advisory Services

- Solutions that use Machine Learning algorithms to provide consumers with investment advice.
- Emphasizing the importance of long-term planning and flexibility for Longevity.

Micro-Investments

- More accessible investments to a wider pool of investors.
- Tailored solutions to the specific needs of older customers.

Longevity FinTech

Age-Friendly Banks

- Age-friendly banks focus on providing tailored financial products, services, and protections for older adults.
- Financial institutions have a responsibility and opportunity to better serve the growing older adult population.

Longevity Credit Unions

- Credit unions are a type of financial cooperative that provide traditional banking services and can be formed by companies or communities for their employees and members.
- Longevity credit unions are tailored to meet the financial needs of the aging population and provide services such as financing for life expenses.

Retiree Employment

- The trend of older adults remaining economically active in senior age presents an opportunity for companies to develop solutions catering to this demographic, such as specialized hiring platforms and educational initiatives.
- As the older population constitutes a significant portion of the workforce, offering employment benefits that cater to their needs can also be a potential opportunity for companies.

Healthy Lifestyle Bonuses

- The segment involves companies that provide solutions for an active and healthy lifestyle, and is expected to grow in upcoming years due to increasing demand from clients.
- These solutions aim to improve the overall well-being of clients and can include various types of businesses, such as fitness, nutrition, and wellness.

Providers of Reverse Mortgage (Equity Release)

- A reverse mortgage is a type of loan used by homeowners of at least 60 years old who have considerable equity in their homes.
- In comparison with traditional asset-backed loans, reverse mortgage loans provide the elderly with a means of hedging Longevity Risk by helping to maintain a sustainable level of retirement income, while retaining tenure in the home.

Longevity Insurance and InsurTech

InsurTech Marketplaces and Platforms

- Insurance marketplaces and platforms are digital ecosystems that connect industry participants, boosting innovation, price, and purchasing Longevity-related insurance products.

IoT InsurTech (Wearables)

- Wearables like smartwatches and fitness trackers help InsurTech companies track customers' lifestyles. This data can be used to customize insurance policies and pricing based on risk.

Big Data Actuarial Models and Premium Calculations

- Big Data and AI can help insurance companies construct mortality models for use by their actuaries.
- These models can improve pricing, underwriting, and identification of new market opportunities for Longevity-related products.

Life InsurTech

- Life InsurTech subsegment covers organizations that provide payment of a stipulated sum to a designated beneficiary upon death of the insured.

Disability InsurTech

- Disability insurance products provide income in case of policyholder's inability to work due to disability.
- These InsurTechs play a pivotal role in ensuring the extended Wealthspan of the population.

Health InsurTech

- The financing structure of healthcare system and, particularly, the health insurance has a vital role in improving the overall quality and expectancy of life. It helps to reduce mortality and increase life expectancy.

Wealth Insurance and InsurTech

- Long-term care insurance covers costs for long-term care services, such as nursing homes and assisted living facilities. Estate planning helps preserve wealth and transfer it to future generations.

Automated Claims Management

- This sector includes handling tasks such as assessing and processing claims, determining fraud, and providing quick service and efficient experience for customers.

Longevity Securitization

Securitization Service Providers

- Securitization service providers can help pension funds and insurance companies to structure and market securities that are backed by their pension or annuity assets.
- They can also manage and service the securities after they have been issued.

Derivative Providers

- The providers can help pension funds and insurance companies to manage interest rate and credit risk of the pension or annuity assets and borrow money using these derivatives.
- They can also help pension funds and insurance companies to borrow money using these derivatives.

Government Bodies

- Government can create and regulate the market for Longevity-linked securities. It can issue sovereign Longevity bonds to finance the cost of living of an aging population.
- Government bodies can also provide guarantees and reinsurance to help pension funds and insurance companies to borrow money against their pension or annuity assets.

Clearing and Settlement Services

- Clearing and settlement services provide pension funds and insurance companies with services to clear and settle trades of Longevity-linked securities. They can help to reduce the counterparty risk of trading these securities.
- These entities can also provide services to manage the collateral and margin of these securities.

Trust Companies

- The companies can provide pension funds and insurance companies with trust and custodial services, and can also invest in securities that are backed by their pension or annuity assets.
- They can also invest in securities that are backed by pension or annuity assets.

Rating Agencies

- Rating agencies can provide credit ratings for securities that are backed by pension or annuity assets, which can make it easier for pension funds and insurance companies to borrow money.
- They can also invest in securities that are backed by pension or annuity assets.

Longevity Risk-Exposed Organizations

Corporate and Independent Pension Funds

- Corporate pension funds provide retirement benefits to current and former employees of a company and may transfer Longevity Risk off their books.
- Independent pension funds are retirement savings plans that are not affiliated with a specific employer or organization, created with the goal of providing a reliable source of income in retirement.

Public Pension Funds

- Public pension funds are retirement savings plans that are established and managed by government entities.
- Longevity Risk is a major concern for public pension funds as the increased life expectancy of their members puts a strain on the funds' ability to meet their long-term obligations.The potential for underfunding and insufficient contributions can lead to significant financial burdens for government entities and taxpayers.

Healthcare Providers

- Healthcare providers face increased costs as the population ages and lives longer. Long-term care and chronic disease management put strain on healthcare systems.
- Healthcare providers may see a reduction in revenue as older patients require more long-term care and less acute care, which is typically more profitable for providers.

National Healthcare Budgets

- Governments have significant Longevity Risk exposure through public pension plans and social security schemes.
- To address this risk, governments can implement measures such as acknowledging the exposure, ensuring fiscal sustainability, risk sharing with private pension providers, and transferring the risk through pension system reform and individual financial buffers.

Annuity Providers

- Annuity providers may face financial strain as they may have to pay out benefits for longer periods of time due to increased Longevity.
- The liabilities of life insurance companies are also highly exposed to Longevity Risk while their assets, typically equities, bonds, and real estate, are not. Large insurance corporations hold a large amount of Longevity Risk, and many of them, such as Towers Watson and Swiss Re, already practice the risk transfer to global reinsurers large enough to absorb the risk.

Bridge Solutions to Neutralize Longevity Risk Impact

Longevity Risk Transfer

- A global value chain for Longevity Risk transfer is emerging, allowing for a wider range of risk takers, including capital markets to take on Longevity Risk.
- The transfer of Longevity Risk to the capital markets is becoming increasingly popular as a way to mitigate the impact of rising life expectancy on pension funds and other risk holders.

Pension Derivatives

- Examples of derivatives that can be used for this purpose include Longevity swaps and Longevity bonds.
- Pension derivatives allow pension funds to lock in a certain level of Longevity Risk and transfer the remainder to other market participants, reducing their overall exposure to the risk of increased life expectancy.

Longevity Risk Reinsurance

- Large Longevity Risk holders already practice the risk transfer to global reinsurers large enough to absorb the risk.
- Transferring Longevity Risk to reinsurance providers is becoming a popular solution for large risk holders to mitigate the effects of increasing life expectancy.

Longevity-Enhanced Annuities (QLACs)

- Annuities are a way to transfer individual Longevity Risk to insurance companies by paying an upfront amount for guaranteed lifelong payments.
- Longevity-enhanced annuities, such as QLACs, provide an income during retirement and protect against outliving personal savings.

Actuarial Consulting Firms

- Develop and implement Longevity Risk management strategies, including the use of hedging instruments and the transfer of risk to the capital markets.
- Provide actuarial modeling and analysis to assess the potential financial impact of Longevity Risk on an organization's balance sheet and future profitability.

Underwriters (Banks and Asset Managers)

- Banks and asset management companies are interested in acquiring exposure to Longevity Risk as it has a low correlation with traditional market risk factors.
- Underwriters invest in securities that are backed by pension or annuity assets.

Novel Longevity Financial System (*Concepts*)

Longevity Investment Bank

- Longevity Investment Bank helps corporate and institutional investors trade Longevity financial assets and instruments.
- The Longevity Investment Bank incorporates HealthTech, BioTech, and Longevity industries into its financial scope.

Longevity Stock Exchange

- Structure, liquidity, capital lock-up, and opaque scientific due diligence plague the Longevity Industry.
- Private capital obstacles and retail investor, capital flow barriers present a huge opportunity to serve the Longevity market.

Longevity Exchange-Traded Fund (ETF)

- The ETF will bridge the liquidity gap, currently hindering Longevity start-ups, by increasing investor confidence in the Longevity Industry.
- Longevity ETF is a collection of stocks of publicly traded companies that focus on the Longevity Industry.

Biological Age-Based Insurance

- Biomarkers, especially Longevity Biomarkers, can optimize financial services and products.
- Biomarkers of Human Longevity and other human validation are being used in products, services, and strategies.

Longevity Innovation Marketplace

- Longevity Innovation Marketplace offers multiple health-focused products and services to many users.
- It could be used to mass-market Longevity financial structured products like synthetic derivatives tied to the aging population.

AgeTech-Friendly NeoBanks

- Neobanks are digital banks that operate through mobile apps and do not have physical branches aimed for tech-savvy customers.
- AgeTech-friendly neobanks aim to meet the needs of older population and assist in personal financial planning for prolonged lifespan.

Longevity Biomarkers for De-Risking

- Lifespan biomarkers guide personalized health and wellness interventions.
- De-risking aging-related diseases and improving age predictions with Longevity Biomarkers can promote healthy aging and increase lifespan.

Longevity Rating Agency

- A Longevity rating agency evaluates Longevity Risk management, health and wellness products, and age-tech start-ups.
- Longevity rating agencies provide transparent and accurate information to investors in the rapidly growing Longevity and healthy aging market.

DEEP KNOWLEDGE GROUP

Longevity Financial Industry Framework Segments and Subsegments Definition and Description

Longevity WealthTech and Asset Management, Longevity Insurance and InsurTech

Longevity WealthTech and Asset Management

- The Longevity WealthTech industry comprises products and services that either simplify or enhance the creation and maintenance of wealth – from savings to investment – for all ages of society. The term “WealthTech” covers a new generation of financial technology companies that create digital solutions to transform the investment and asset management industry. New companies are arriving on the scene and are offering advice based on AI and Big Data.
- The importance of Longevity WealthTech lies in providing tech-enabled products for management of personal wealth by people of old age. Given the statistics on the increasing proportion of seniors in general wealth, the sector is poised to demonstrate continual growth in the future. The impending maturation of Longevity-focused investment products in the next 5 years has a promising outlook. Novel products that can enable liquidity, tradability, and exposure to private equity markets are emerging. For the first time, such risk-averse exposure to the Longevity market will be available to professional investors and the conservative investment community.

Longevity Insurance and InsurTech

There is a growing focus on how the insurance industry needs to adapt to adjust to an increasingly long-lived population. Bundling well-being initiatives between Longevity and insurance companies have a great potential to resolve the possible challenges in a more holistic manner. With a broad range of innovative solutions created for health insurance, the broader inclusion of Longevity-tied InsurTech solutions is underway. AI and advanced technologies can transform the life and health insurance industries, making them more efficient, personalized, and accessible. DKG sees AI as a way to streamline operations, provide customized services, and increase the accessibility of insurance products. However, most AI and InsurTech industry experts also acknowledge the need to address new challenges, particularly data privacy and security, to ensure these technologies are implemented responsibly and effectively.

Longevity FinTech, Longevity Securitization

Longevity FinTech

Financial services innovators can improve the financial lives of a billion people by designing new solutions, adapting existing products, de-risking the Aging Population problem, and turning it into a source of growth and untapped market potential. Banking, financial, and asset management firms have had to adapt to the population's extended Longevity, increasing senior customer demand and forcing them to assess risks. Longevity Finance Industry FinTech companies provide wealth- and health-accelerating services. Longevity FinTech companies attract people aged 60+ who expect to live to 100 years and beyond, recognize Health as the New Wealth, and have unprecedented demand for technologies that optimize Wealthspans in step with increasing Healthspans. Age-friendly FinTech companies and Longevity banks will create new financial products for clients who want to live long and financially stable lives in the coming years.

Longevity Securitization

New global capital markets like the life market and Longevity Risk transfer market are growing in the Longevity financial industry. "Longevity pools" are the first 21st-century asset class. Longevity Risk affects pension funds and life insurers. The entities that are highly-exposed to Longevity Risk have to understand a wide range of Longevity Risk issues, from the measurement of risk for pricing, reserving, and setting aside capital to the management of risk through de-risking, reinsurance, and capital markets solutions, such as Longevity-derived financial instruments. Selling pension plans, reverse mortgages, and Longevity-linked annuities can be risky. Nonfinancial actors create bridge solutions to neutralize Longevity Risk impact. Actuarial consulting firms, pension and Longevity derivatives, and Longevity Risk transfer providers must solve Longevity Risk issues. Advanced actuarial models, insurance structures, and financial instruments help financial institutions better serve clients and ensure long-term financial stability by managing and transferring Longevity Risk.

Bridge Solutions to Neutralize Longevity Risk Impact, Longevity Risk-Exposed Organizations

Bridge Solutions to Neutralize Longevity Risk Impact

The Longevity Financial Industry is expanding rapidly, with the emergence of new global capital markets such as the life market and Longevity Risk transfer market. "Longevity pools" are predicted to become the first major asset class of the 21st century. Traditional financial entities, such as pension funds and life insurance are highly exposed to Longevity Risk and need to understand a wide range of Longevity Risk issues. These include risk measurement for pricing, reserving, and setting aside capital, risk management through de-risking, reinsurance, and capital markets solutions, and the use of Longevity-derived financial instruments. Many asset management firms and banks are interested in acquiring exposure to Longevity Risk since it has a low correlation with classic market risk factors, and can assist other financial institutions exposed to this type of risk. They can also hold a significant portion of the risk when providing pension plans, reverse mortgages, or Longevity-linked annuities to their clients.

Longevity Risk-Exposed Organizations

Longevity Risk arrives due to inaccurate predictions of the level of mortality rate and the number of retirees. Established Entities Exposed to Longevity Risk, including traditional financial entities, especially various pension funds, annuity providers, national healthcare budgets and healthcare (management) providers, are under pressure by the Silver Tsunami and have to understand the full scope of Longevity Risk issues that affect their business models. Government-backed, corporate and independent pension funds are the biggest holders of Longevity Risk in the global economy. They are incentivized to transfer Longevity Risk off their books, especially since this risk exposure is potentially the largest among other entities. Another reason why managing Longevity Risk has become more important is new regulation requirements. Solvency II, a European Union directive, requires insurance companies to assess Longevity Risk and increase capital.

Novel Longevity Financial System (Concepts), Longevity Investment Organizations

Novel Longevity Financial System (Concepts)

- AI, InsurTech, LegalTech, RegTech, and Human Biomarkers of Longevity will merge into integrated technology in the next few years, transforming Longevity-focused FinTech MVPs into well-known companies. This technological convergence in the Longevity Industry will produce more sophisticated results and lead to the widespread adoption of Longevity investment banks, ETFs, Longevity-focused stock exchanges, alternative trading systems, etc.
- This segment includes next-generation integrated health and personal finance solutions. Precision Health technologies will drive the most practical outcomes in Healthy Human Longevity, but they will also need financial products and services like InsurTech, AgeTech, HealthTech, and WealthTech. Progressive financial companies are embracing Longevity.

Longevity Investment Organizations

- The Longevity investment organizations sector includes Longevity Industry investees and Longevity-focused investment funds that fund, mentor, and share their network to accelerate the industry. Geroscience research, or the Longevity Industry, is overgrowing. However, it is much broader and includes six intersecting sectors with synergies and the potential to extend a healthy lifespan. Financial systems include Longevity-focused VCs, family offices, hedge funds, private equity funds, accelerators, and incubators. These funds aim to finance innovative Longevity-related technologies and services. These entities may fund research into aging mechanisms, drug and therapy development for age-related diseases, and age-friendly environments and technologies.
- Longevity finance's diverse funding sources for companies at various stages of development can also reduce Longevity investment risk. This attracts more investors and encourages Longevity-related investment.

DEEP KNOWLEDGE GROUP

Longevity Financial Industry Framework Subsectors Definition and Description

Longevity Insurance and InsurTech (1/2)

InsurTech Marketplaces and Platforms

This subsegment aggregated insurance marketplaces and platforms, digital ecosystems that enable carriers, customers, agents, brokers, and even noninsurance participants to seamlessly connect with each other, thereby transforming the way insurance products are distributed and purchased. The marketplace can create economic benefits for participants, spark innovation, and improve price transparency. The wider proliferation of such solutions can accelerate the trading and distribution of novel Longevity-related insurance products.

IoT InsurTech (Wearables)

The Internet of Things (IoT) refers to the interconnected network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, and connectivity which enables these objects to connect and exchange data. Wearable devices, such as fitness trackers, collect and transmit data about an individual's health and activity level. This data can then be used by insurance companies to create more personalized and accurate insurance policies. For example, if a wearable device shows that an individual has a healthier lifestyle, the insurance company may offer them lower rates. InsurTech companies use IoT data to improve the overall insurance process, from underwriting and risk assessment to claims and settlement.

Big Data Actuarial Models and Premium Calculations

Actuarial modeling involves a set of techniques used in the insurance industry. These models are composed of equations that represent the functioning of insurance companies, accounting for the probabilities of the events covered by policies, and the costs each event presents to the company. With the advantages possessed by Big Data and AI, insurance companies will be able to construct a range of stochastic models of mortality for use by their actuaries.

Life Insurance and InsurTech

Life insurance subsegment covers organizations, namely insurance companies providing payment of a stipulated sum to a designated beneficiary upon death of the insured.

Liabilities in life insurance and annuity businesses move in opposite directions in response to possible mortality improvements, which creates a natural hedging opportunity. For a life insurance company, the possible deviations from the mortality assumptions used for pricing at the time of contracts being underwritten are serious threats to its financial performance when writing insurance and annuity policies.

Longevity Insurance and InsurTech (2/2)

Wealth Insurance and InsurTech

Advanced wealth insurance technologies are changing the way insurance companies approach the management of insurance policies and investment portfolios. One of the key ways that advanced wealth insurance technologies are changing the industry is through the implementation of real-time customer support. AI-powered chatbots and virtual agents can quickly and efficiently answer customer questions and resolve issues, improving the overall customer experience. In addition to these applications, advanced wealth insurance technologies are also being used to develop new business models which allow customers to access personalized financial advice and investment recommendations without the need for human interaction.

Automated Claims Management

InsurTech companies are using technology such as Artificial Intelligence and Machine Learning to automate the claims management process in the insurance industry. This automation includes tasks such as assessing and processing claims, detecting fraud, and providing a more efficient and customer-focused experience. The goal of this automation is to streamline the claims process, reduce processing times, improve accuracy, and enhance customer satisfaction. By using technology in this way, InsurTech companies are aiming to disrupt and improve traditional insurance practices

Disability Insurance and InsurTech

This subsegment includes insurance products that provide income in the event that a policyholder is prevented from working and earning an income due to a disability. Loss of income can be devastating, but disability insurance would ensure clients' bills continue to be paid by replacing a portion of paycheck.

Disability insurance plays a pivotal role in ensuring the extended Wealthspan of the population. Therefore, the subsector will be represented by the organizations providing or developing disability insurance solutions.

Health Insurance and InsurTech

The subsegment involves the organizations engaged in granting and distribution of insurance that covers the whole or a part of the risk for a person incurring medical expenses.

The lack of universal access to healthcare undoubtedly increases mortality and reduces life expectancy. The financing structure of the healthcare system and, particularly, the health insurance constituent, has been a vital pillar in improving the overall quality and expectancy of life.

Longevity WealthTech and Asset Management

Digital Brokers

Online platforms and software tools make stock market information and investment possibilities available to everybody. Many modern-day financial consumers are more demanding of simple and easy wealth management options that can be accessed at any time. The accessibility of smartphones has created digital brokers who are disrupting the investment and wealth management sector by developing finance apps that make stock markets and innovative tools more accessible to a wider consumer base.

AI-Driven Advisory Services

The segment aggregates solutions utilizing Machine Learning algorithms that provide consumers with advice based on the most lucrative investment possibilities, the user's risk aversion profile, and other data. As the population ages, wealth managers and investment advisors are increasingly looking for ways to educate their clients on the importance of long-term planning and the flexibility that must accompany the possibility of Longevity.

Novel Retirement Plans and Robo-Retirement

This sector maps the innovative solutions related to retirement plans. When an individual invests with robo-advisors, they may answer questions about existing savings, the rate of personal contributions, target savings goal, and risk tolerance. By factoring in the client's responses and some assumptions about various asset-class returns, the robo-advisor can help predict whether or not the person is on track to reach retirement goals by the target date. If a person is at risk of missing a goal, it can also recommend ways in which the person can get back on track.

New-Gen AI-Driven Portfolio Management

AI-driven portfolio management tools provide an enhanced experience to investors. It is expected that such solutions will continue to gain support from people of older age. Lower fees and investment minimums are reasons to consider a digital portfolio over a human fund manager. An AI portfolio can perform better than a professionally managed one because while professional fund managers can only use currently available information in an attempt to outperform the market, AI can utilize Big Data and scrape the internet to build highly intricate models that predict future market movements with precision.

Micro-Investments

Micro-investments solutions largely comprise the products and services that are making the investments more accessible to a wider pool of investors. In the Longevity context, such solutions are addressed at senior customers and are adjusted to the specific needs of this age group. This is a reasonable trend, given the increasing volume of wealth accumulated by the older population and wider adoption of digital products among them.

Investment Banks and Asset Managers

WealthTech uses technology to improve various aspects of wealth management, such as investing and retirement planning. By using WealthTech, these entities can provide personalized financial planning and retirement plans that consider factors such as inflation and life expectancy. WealthTech can also be used to manage investments and improve client engagement and communication through the use of chatbots and robo-advisors.

Longevity Securitization (1/2)

Derivatives Providers

Derivatives providers play an important role in the commoditization of new asset classes such as Longevity and DeepTech. Derivatives providers are organizations that create and sell derivatives, providing investors with a way to hedge their risk or speculate on the price movements of underlying assets. In the process of commoditizing new asset classes, derivatives providers help create standardization and transparency in the market.

By creating standardized contracts that are traded on exchanges, derivatives providers enable investors to trade these assets in a more efficient and cost-effective manner. This increased standardization and liquidity can help to reduce the risk associated with investing in new asset classes, making them more accessible and attractive to a wider range of investors. Furthermore, derivatives providers often play a key role in providing market information and data to support price discovery and transparency in new asset classes.

Securitization Service Providers

Securitization is the process of pooling together a group of assets and then issuing securities backed by those assets. These securities can be traded on financial markets, making it easier for investors to invest in new and diverse asset classes.

Securitization service providers are organizations that provide the infrastructure and expertise necessary to securitize new asset classes. This includes underwriting the securities, setting up the trusts and trusts structures, and providing ongoing servicing of the underlying assets.

In the process of commoditizing new asset classes, securitization service providers help to increase the liquidity and accessibility of these assets. By making it easier for investors to invest in new asset classes through the issuance of securities, securitization service providers can help to increase the demand for these assets, thereby increasing their price and popularity.

Government Bodies

Government bodies play a crucial role in Longevity securitization and risk transfer by setting regulations and standards for the Longevity market and ensuring that securitization and risk transfer activities are conducted in a safe and fair manner. Government bodies may also provide support to the Longevity market through tax incentives and other financial mechanisms to encourage investment in Longevity-related securities. They may also collect and analyze data on Longevity trends and use this information to inform public-policy decisions and ensure that the Longevity market is functioning smoothly. Ultimately, government bodies help create a supportive and stable environment for the growth and development of the Longevity market, which, in turn, helps to mitigate Longevity Risk and promote economic stability.

Longevity Securitization (2/2)

Trust Companies

A trust company is a financial institution that provides trustee services, such as holding, managing, and administering assets for the benefit of its clients. Trust companies play a critical role in enabling the securitization of new asset classes. There are several different types of trust companies, including corporate trust companies, estate and personal trust companies, institutional trust companies, asset management trust companies, etc.

By serving as a trustee of securitized assets, trust companies ensure that the underlying assets are managed in accordance with the terms of the security, helping to increase the confidence of investors and reducing the risk associated with these assets.

Rating Agencies

A rating agency is a company that assesses the financial strength of companies and government entities, especially their ability to meet principal and interest payments on their debts related to the default risk. The rating assigned to a given debt shows an agency's level of confidence that the borrower will honor its debt obligations as agreed. Each agency uses unique letter-based scores to indicate if a debt has a low or high default risk and the financial stability of its issuer. The debt issuers can be different economic entities, such as sovereign nations, local and state governments, special-purpose institutions, companies, or nonprofit organizations. The rating agency's scores represent the likelihood that the borrower or issuer will meet its contractual and financial obligations as they become due and is not a recommendation to buy or sell a security. It also does not address market liquidity or volatility risk.

Clearing and Settlement Services

Clearing and settlement services play a crucial role in the securitization of assets by facilitating the transfer of ownership of securities and ensuring the smooth functioning of financial markets. These services act as intermediaries between buyers and sellers of securities and help to streamline the process of trade execution, validation, and confirmation. They also maintain records of transactions, track ownership of securities, and ensure that the appropriate amounts of money are exchanged between parties. Clearing and settlement services also reduce the risk of default by ensuring that all trades are settled and cleared in a timely and efficient manner. Through their role in the securitization of assets, clearing and settlement services help to promote transparency, reduce transaction costs, and increase the efficiency of financial markets.

Longevity Investment Organizations (1/2)

Longevity-Focused Family Office

Longevity-focused family offices are specialized investment entities that are owned and operated by HNWIs or families. These family offices are unique in that they have a long-term perspective on their investments and are often able to take a more patient and strategic approach to investing in the Longevity Industry. They may also have the financial resources and expertise to invest in a wide range of Longevity-related assets, including start-ups, funds, and direct investments in Longevity companies and technologies.

Overall, Longevity-focused family offices play an important role in the growth and development of the Longevity Industry by providing capital and support to promising companies and initiatives in this space. By doing so, they aim to drive innovation, improve health outcomes, and help to make Longevity solutions more widely available and accessible to people around the world.

Longevity-Focused VCs

Longevity-focused venture capital (VC) funds are investment institutions that focus mainly on funding start-ups and early-stage companies in the Longevity Industry. These funds are among the leading funding sources in the Longevity space and aim to drive breakthroughs.

The goal of these VCs is to invest in promising Longevity companies and support them as they grow and develop their technologies and products. By doing so, these VCs hope to accelerate the commercialization of new Longevity solutions and make them more widely available and affordable to the general public. Longevity-focused VCs often partner with leading scientists, researchers, and industry experts to identify the most promising Longevity start-ups and technologies. They also provide funding, mentorship, and strategic guidance to help these companies overcome the challenges of developing and commercializing new Longevity solutions.

Longevity Companies

The Longevity Industry includes entities related to scientific research into aging and its diseases (i.e., geroscience research) but also to a set of synergies between different intersecting sectors, such as P4 (personalized, precision, preventive, participatory) Medicine, AgeTech (the emerging subset of the HealthTech sector that focuses on technology to improve the lives of older people), with the combined potential to extend healthy life span.

As the majority of full-blown Longevity start-ups are quickly becoming mature companies – at least 500 publicly traded corporations – large institutional investors are making increasingly more investments in the industry, and a full-fledged Longevity infrastructure is emerging.

Longevity Investment Organizations (2/2)

Hedge Funds

Hedge funds aim to benefit from breakthroughs in the field of Longevity and provide the capital and resources needed to support the growth and development of companies in the Longevity Industry.

Hedge funds employ a range of investment strategies, including both traditional and alternative strategies, to achieve their investment objectives. They may invest in a wide range of Longevity-related assets, including stocks, bonds, funds, and direct investments in Longevity companies and technologies.

Accelerators and Incubators

Accelerators and incubators provide start-ups in the Longevity Industry with access to resources and mentorship to help them develop their products and grow their businesses. These organizations are designed to support early-stage companies as they navigate the challenges of starting and growing a new business, and typically offer a range of services and support. By providing start-ups with access to resources, mentorship, and a supportive community, these organizations aim to improve the chances of success for Longevity companies and help to drive innovation in this field. In addition to helping start-ups grow their businesses, many Longevity accelerators and incubators are also motivated by the social impact of investing in Longevity companies.

Private Equity Funds

The main goal of private equity funds, such as growth equity, buyout, and mezzanine funds, is to generate attractive returns for their investors, while also supporting the growth and development of the Longevity Industry. By providing capital and resources to Longevity companies, these funds aim to drive innovation, improve health outcomes, and help to make Longevity solutions more widely available and accessible to people around the world.

Longevity Risk-Exposed Organizations (1/2)

Corporate and Independent Pension Funds

Pension funds are financial intermediaries that provide social insurance by giving retirement income to insured individuals. Frequently, they also offer disability and death payments. Pension plans are crucial pillars of retirement income for households around the world. They also play a role in financial markets as institutional investors. A corporate pension plan is a benefit that provides income in retirement based on the employee's length of service to the company and salary history. Pension funds are pooled monetary contributions from pension plans set up by employers, unions, or other organizations to provide their employees or members retirement benefits.

Corporate pension funds are among the largest Longevity Risk takers, which requires the development of actionable frameworks to ensure the stability of such financial institutions and the stability of the population's retirement benefits.

State Pension Funds

Public (state) pension funds are retirement benefit plans managed by state or government entities for their employees. These funds are designed to provide retirement income and benefits to public sector employees, such as teachers, police officers, firefighters, and other government workers.

Government-managed pension funds are highly exposed to Longevity Risk because they are designed to provide retirement benefits to individuals for the rest of their lives. Pension funds are incentivized to transfer Longevity Risk off their books, especially since this risk exposure is potentially the largest among other entities. For small pension funds, the case for Longevity Risk transfer may be strong as they tend to have a more extensive risk exposure due to undiversified idiosyncratic Longevity Risk.

National Healthcare Budget

Governments bear significant Longevity Risk through public pension plans and social security schemes. National healthcare budgets worldwide that were originally designed to meet the needs of a population with a certain life expectancy may find themselves struggling to cope with the increasing demand for healthcare services and support as people live longer. To address Longevity Risk, measures include acknowledging government exposure and implementing measures to ensure fiscal sustainability, risk sharing between governments and private pension providers, and transferring Longevity Risk to those that can better bear it through pension system reform and individual financial buffers.

Longevity Risk-Exposed Organizations (2/2)

Healthcare Providers

The types of healthcare providers that are highly exposed to Longevity Risk include long-term care facilities, home health agencies, hospices, rehabilitation facilities, and geriatricians. These providers offer services and support to older adults who may require more specialized medical care and support as they age.

Longevity Risk negatively impacts healthcare providers in a few ways:

- Increased healthcare costs: As people live longer, they are more likely to develop chronic illnesses and require long-term care, which can lead to increased healthcare costs for providers.
- Strained healthcare resources: An aging population may put a strain on healthcare resources, such as hospital beds and staff, leading to potential shortages and overburdening of the healthcare system.
- Reduced revenue: Healthcare providers may see a reduction in revenue as older patients require more long-term care and less acute care, which is typically more profitable for providers.
- Changing demand for services: The demand for certain healthcare services may change as the population ages, requiring providers to adapt and adjust their offerings to meet the needs of older patients.
- Risk of insolvency: As the Longevity Risk increases, pension funds, health insurance companies, and other financial entities will have to pay out larger and larger amounts of money to cover the costs of healthcare for older patients, potentially putting them at risk of insolvency.

Annuity Providers

Annuities provide a guaranteed series of lifelong payments in exchange for an upfront amount. Annuities are purchased to provide an income during retirement and protect against outliving personal savings. This solution features an annual increase in income depending on a future declared bonus rate. Thus, Longevity Risk resides with the life insurer while the investment risk primarily resides with the annuitant.

In the case of life insurance policies, the event is usually the death of the insured or deterioration in health. Life insurance policies are frequently purchased to save money for extended periods and sometimes for retirement.

The liabilities of life insurance companies are also highly exposed to Longevity Risk while their assets, typically equities, bonds, and real estate, are not. Large insurance corporations hold a large amount of Longevity Risk, and many of them, such as Towers Watson and Swiss Re, already practice the risk transfer to global reinsurers large enough to absorb the risk, using it as an offsetting hedge for their mortality risk portfolios, but in some cases, the risk is transferred to the capital markets, too. The most widespread method of Longevity Risk transfer is Longevity reinsurance, which is closely followed by the rapidly expanding market for Longevity swaps.

Bridge Solutions to Neutralize Longevity Risk Impact (1/2)

Actuarial Consulting Firms

Actuarial consulting firms offer expert advice and analysis on the financial implications of different types of risks for businesses and organizations, including Longevity Risk. The services provided by these firms include developing and implementing Longevity Risk management strategies, actuarial modeling and analysis, offering advice on Longevity Risk-related insurance products and assessing the impact of demographic and mortality trends. Actuarial consulting firms can help organizations identify and manage their Longevity Risk exposures and make informed decisions about risk management strategies, thereby playing a vital role in mitigating the impact of Longevity Risk on an organization's financial health.

Longevity Risk Transfer

The subsegment covers a wide range of organizations, namely insurance, reinsurance companies, pension funds, and banks that make operations associated with Longevity Risk transferring or hedging. The more developed global value chain is already emerging for transferring Longevity Risk from traditional holders of such risk — public and private pension funds — to a broader set of risk takers, including the capital markets.

Underwriters (Banks and Asset Managers)

Many asset management companies (AMCs), especially hedge funds, mutual funds, and private equity funds, are interested in acquiring exposure to Longevity Risk since it has a low correlation with classic market risk factors: inflation risk, liquidity or currency risk. AMCs, besides others, act as arbitrageurs and speculators in the global financial ecosystem. They seek to profit from any pricing anomalies in Longevity derivatives. The precise and correct pricing of Longevity derivatives is a potential prospect for AMCs to make a profit.

Traditional banks can also be interested in Longevity Risk to assist financial institutions exposed to Longevity Risk, as well as in holding a significant portion of the risk when providing pension plans, reverse mortgages, or Longevity-linked annuities to their clients.

It is commonly believed that the capital markets will, at some time, be necessary as a destination for the transfer of Longevity Risk as reinsurers grow too concentrated and require a place to release this risk. For example, banks and AMCs can profit from using Longevity instruments to predict demographic trends of population aging and profit from aging in the following way: Pension plan provider receives compensation for extra payments due to worse realized mortality rates and pays the insurer when realized mortality rates are better than expected. A bank uses swaps or other Longevity-linked security to propose both sides better hedge of payments risk and profit on risk premiums and commissions.

Bridge Solutions to Neutralize Longevity Risk Impact (2/2)

Longevity Risk Reinsurance

Longevity risk reinsurance is insurance that helps transfer the risk of losses due to unexpected increases in life expectancy from an insurer to a reinsurer. Insurers face significant financial risks associated with longer life expectancies of their policyholders, and transferring some of this risk to reinsurers can help them manage their risk exposure. Reinsurers, in turn, can benefit from this arrangement by charging a premium to take on this risk and diversifying their risk portfolio. Transferring Longevity Risk to the reinsurance market is gaining wider adoption as it is an effective instrument to tackle the existing problem of the rising life expectancy of the population. Overall, Longevity Risk reinsurance plays a crucial role in managing and mitigating the impact of Longevity Risk on insurers and reinsurers.

Longevity-Enhanced Annuities (QLACs)

Longevity-enhanced annuities, or QLACs, are a type of annuity that can provide a guaranteed lifetime income stream, with payments beginning at an advanced age, such as 80 or 85. One of the critical benefits of QLACs is their ability to help individuals manage Longevity Risk or the risk of outliving their retirement savings. QLACs can be purchased using funds from a qualified retirement account, such as a 401(k) or IRA, and are exempt from required minimum distribution rules until payments begin. The longer the deferral period, the higher the income payments will be, making QLACs an attractive option for those looking to supplement their retirement income. However, it's essential to carefully consider the terms and conditions of QLACs before making a purchase as they can be complex financial products with fees and restrictions.

Pension Derivatives

Longevity swaps and Longevity bonds are examples of derivatives that can be used to hedge Longevity Risk in pension savings. By using these derivatives, pension funds can transfer some of the risk associated with increasing life expectancies to other market participants who are better able to bear it, thus reducing their overall exposure to this risk. This can be achieved by locking in a certain level of Longevity Risk and transferring the remainder to other market participants. The use of pension derivatives provides pension funds with a way to manage their exposure to Longevity Risk and to better ensure the long-term sustainability of their pension plans. This is especially important given the increasing life expectancies of populations worldwide, which pose a significant threat to the financial stability of pension funds.

Novel Longevity Financial System – *Concepts* (1/2)

Longevity Investment Bank

The concept of Longevity Investment Bank can be described as an institution aimed to service corporate and institutional investors intending to trade Longevity financial assets and instruments. Longevity Investment Bank will enable the involved parties to manage their investments, thereby, creating innovative environments with advanced InvestTech solutions.

The novel nature of the Longevity Investment Bank lies, among others, in sophisticated Longevity investment analytics, bringing the most innovative developments in HealthTech, BioTech, and Longevity industries into the financial scope of emerging investment products and financial services and providing parties involved with comprehensive data for making investment decisions.

Longevity Innovation Marketplace

Longevity Innovation Marketplace is set to involve many users, providing access to a high volume of precisely targeted health-focused products and services, combined with periodic measurement of the effects of these products in their general state of health and biological age.

Such a marketplace could be a perfect place for mass-marketing new types of Longevity financial structured products in the form of synthetic derivatives that will be tied directly to the aging population, as well as an apparent trajectory for growth. For example, a platform with a Longevity Marketplace should provide access to financial products like derivatives tied to real estate or nursing homes. Other examples are survivor bonds, which pay a coupon based on the "survivorship" of a stated population group, and Longevity notes, which reference a pool of predefined lives.

AgeTech-Friendly NeoBanks

Neobanks are digital banks without any physical branches, developed for the growing number of tech-savvy customers who prefer to manage their money using mobile apps or other digital media. Neobanks are disrupting the traditional banking system by leveraging technology and Artificial Intelligence to offer a range of personalized services to their customers. Conversely, traditional banks follow an omnichannel approach; i.e., they have both physical (through branches and ATMs) and digital banking presence to offer a multitude of products and services.

Longevity Exchange-Traded Fund

A particular exchange-traded fund (ETF) dedicated to Longevity derivatives will boost confidence of investors in the Longevity Industry. The Longevity ETF will consist of the stocks of the Longevity-focused publicly traded companies.

With the investors gaining confidence in the Longevity Industry because of ETFs, the liquidity gap currently sending most Longevity start-ups to Death Valley will be bridged. They will give investors a greater possibility to invest in the Longevity Industry, while being secure about their funds.

Novel Longevity Financial System – *Concepts* (2/2)

Longevity Biomarkers for De-Risking

Many financial services and products can be optimized using biomarkers and, in particular, Biomarkers of Human Longevity. Such an approach shows great value for a whole variety of financial entities, both governmental and privately held, providing optimized hedging solutions.

While the InsurTech sector is the leading example of financial companies onboarding the practical application of Biomarkers of Longevity today, it is just the start of a much larger trend that will involve the financial industry (across many sectors) incorporating the use of biomarkers and potentially other market-ready, tangible forms of human validation into their products, services, and strategies in a variety of ways. Epigenetic biomarkers are the latest InsurTech trend.

Longevity Stock Exchange

The Longevity Industry faces structural complexity, low liquidity, long capital lock-up, and opaque scientific due diligence. Current private capital cannot effectively serve the massive Longevity market, creating an enormous symbiotic opportunity for parties willing to bridge this gap and leverage these untapped potentials. No Longevity-themed financial marketplace exists. Financial and regulatory frameworks from the BioTech and HealthTech eras are fragmented. They limit technologically matured companies' liquidity, while failing to protect and de-risk investors' financial interests to the extent needed for their participation. A well-functioning Longevity Exchange can address these issues by bringing more private companies public, allowing price discovery and providing public capital to advance a growing sector with massive social impact.

Biological Age and HALE/QALE-Based Insurance

Biological age differs from chronological age as it takes into consideration a number of factors other than just birth date. Respectively, the calculation of Health-Adjusted Life Expectancy (HALE) and Quality-Adjusted Life Expectancy (QALE) will allow for designing of a new type of insurance product that would take into account the state of an individual's biological age and projected life expectancy.

Longevity Rating Agency

The first-of-its-kind Longevity Rating Agency provides industry-related analytics, rankings, and benchmarks for strategic decisions, market intelligence, and defined business needs. Longevity Rating Agency will provide analytics for vetted Longevity-related organizations. It will benchmark and rank industries. Such an institution may identify new growth opportunities for Longevity companies, generate approaches to mitigate the risks of inappropriate or underinformed business decisions, identify recent trends and challenges facing Longevity Industry decision-makers, and generate actionable insights to react to dynamically and rapidly changing competitive landscapes effectively.