E-Learning Module Readings

Volume 1: Foundations

First Edition

Cover design by Rachel Maragnano

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About e-Learning Module Readings

This publication is a curated collection of readings designed to accompany and enrich your e-Learning experience. Unlike a traditional textbook, it does not follow a linear narrative. Instead, each article, excerpt, or transcript is intended to be engaged with as prompted from the e-Learning modules, reading-by-reading, as needed.

A Note on the Readings

The readings here are drawn from diverse sources: excerpts from published books, articles from a variety of publications, pieces written specifically for the modules, and transcripts from conferences or meetings. Because of this, there are considerable shifts in tone, style, and perspective across the readings. Some are formal and analytical; others are more conversational or practical. Even others are word-for-word transcripts of panel discussions. Maintaining this variety is intentional as it reflects the richness of the subject matter and the many voices contributing to the actuarial profession over the years. The original language of each source has been preserved to maintain its authenticity, even where that means stylistic differences across the readings.

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Think of this book as a reference toolkit, not a cover-to-cover read. Dip into the readings as the module directs you, revisit them as needed, and let the interplay of perspectives deepen your understanding.

Acknowledgment of Contributors

This volume reflects decades of collective effort by practicing actuaries dedicated to the ongoing development of future professionals. The diversity of perspectives contained within these pages stands as testament to the collaborative nature of our profession. The Society of Actuaries (SOA) is profoundly grateful for their contributions.

Acknowledgment of Authors and Professional Sources

Countless published authors and professional actuaries have generously shared their knowledge and insights to the SOA's e-Learning modules over the years. Their contributions through original works, adapted materials, and subject matter expertise have been indispensable in creating this comprehensive resource.

Acknowledgment of Contributing Authors

This volume also includes original writings developed specifically for this publication. The individuals acknowledged below contributed material prepared expressly for inclusion here.

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Brief biographies of these contributing authors appear at the end of the volume.

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Society of Actuaries®

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Pre-Actuarial Foundations Module

Actuarial Science Foundations Module

A Calculated Transformation

Note: The following article is a reprint of Tony Johnson, Seneca Smith, Kara Ross, Catherine Yang, and Taylor Patterson, "A Calculated Transformation: The Actuarial Workforce of the Future Can Provide Even More Value to Employers," The Actuary, March 2019.

Until recently, the typical actuary worked at an insurance company or consulting firm in traditional pricing, underwriting, reserving/financial reporting, modeling, or capital management roles. The actuarial department analyzed and managed insurance risk, relying on tried-and-tested models, systems, and methodologies. While actuaries are still expected to perform these core services, who performs the work, how the work is completed, and what additional work actuaries can and should do has started to shift radically.

The key driver of change in the actuarial workforce is the push to do more with less—a need for organizational cost reduction alongside increased strategic insight. Recent measures to reduce expenditures have extended to the actuarial department, as companies are recognizing the availability and ability of non-actuaries to perform much of the same work at a lower cost. Moving some of the more redundant and repetitive work to non-actuarial resources should create capacity for actuaries to produce more insight and foresight for the enterprise.

As companies rethink the actuarial workforce, many have started to focus on:

- **Realignment of responsibilities.** Insurance companies are reevaluating the work that should be performed by actuaries and how their departments should be structured to optimize the utilization of actuarial skill sets within the organization.
- **Changes in the nature of employment.** The rise of the gig economy, crowdsourcing, and other alternative staffing models is affecting who performs actuarial work.

- **Advancements in technology.** New technological developments that enable improved information processing, data analysis, anomaly detection, and increased opportunities for automation are influencing how traditional actuarial work is performed.

While these company-level changes impact the actuarial workforce, non-traditional opportunities to expand the actuarial profession as a whole have begun to emerge. As companies seek to integrate more advanced analytics capabilities within their organizations—and as the actuarial skill set becomes increasingly desirable outside of the insurance industry—actuaries have more opportunities to expand their skill sets and explore nontraditional career paths. The nature of work is changing across most industries, including financial services, and the actuarial profession is not immune to these changes within the insurance sector.

Organizational Cost Reduction: A Key Driver of Change

Internal factors—such as stagnating sales and the pressure to provide more value-added insights while minimizing expenses—as well as external factors—such as the availability of new technologies and changes in regulatory reporting—have compelled insurance companies to focus on reducing costs. Historically, when companies implemented cost-cutting measures, actuaries were exempt due to the complexity and necessity of their work. Now, companies are realizing that actuaries traditionally have held responsibilities that other types of specialists within the enterprise may be able to perform at a lower cost, and many insurance companies are taking advantage of this revelation.

Because actuaries are among the highest-paid professionals in the financial services industry,[1]. They are now under the spotlight as organizations seek to minimize costs. Insurance companies are evaluating whether their highest-paid practitioners are performing tasks that necessitate the sophisticated skill sets of an actuary. For example, actuaries should not be performing data wrangling; instead, they should analyze the data to provide strategic recommendations and better inform business decisions. In this example, the data wrangling could be performed by someone in a lower-cost position outside of the actuarial department. Technological advancements have made it easier than ever to access and share files across databases and on servers. This enables

[1]Corporate Finance Institute. Actuary: A Finance Professional Who Analyzes Risk and the Costs Associated With Risks and Uncertainty. Corporate Finance Institute (accessed December 7, 2018)

the actuarial department to seamlessly partner with other areas of a company.

As other positions subsume actuarial work, actuaries will have more time to focus on work that aligns with their core capabilities — critical analysis and value-added insight. Released actuarial capacity would enable actuaries to expand their analysis into the drivers of profit and loss, improve internal reporting metrics, and capture detailed insights into asset allocation—all resulting in more informed decision-making.

Extensions of the Changing Actuarial Workforce

Realignment of Roles and Responsibilities

As a direct result of these cost-cutting efforts, combined with the rapid pace of change and the pressure to be lean and efficient, it has become necessary for companies to reevaluate their day-to-day operations and the structure of their workforce. One effort that is attracting attention is the realignment of actuarial roles and responsibilities. This realignment takes two common forms:

1. An evaluation of whether actuaries are doing work that requires true actuarial expertise and assessing whether the work they perform is in line with the responsibilities intended for their assigned roles.
2. An evaluation of the organizational design of the actuarial department, with the potential to move from the traditional "product silos" to "centers of excellence" that span multiple lines of business.

Ensuring the correct alignment of actuarial roles with responsibilities is important for helping actuaries operate as efficiently as possible and adjust to new and ever-changing work environments. As companies undergo this transition, the shift of non-actuarial work—whether to different actuarial roles or to non-actuarial roles within the enterprise—typically proves to be a productive endeavor.

An effective alignment of actuarial roles and responsibilities can lead to increased productivity, allowing actuaries to focus on their core actuarial work. Non-actuarial work—such as data retrieval and manipulation, historical product research, serving as a "shadow IT department," and fielding claims or operations inquiries—should be performed outside of the actuarial department. Shifting those and similar tasks away from actuaries will help increase their capacity to spend more time

on providing insight for the enterprise. As the realignment changes the traditional actuarial workload, actuaries will have time to concentrate on work that requires more judgment and deep actuarial expertise. They will notice their day-to-day focus shifting from supervision and oversight—currently accounting for an estimated 48 percent of an actuary's duties—to more problem-solving, which currently accounts for only 29 percent of actuarial time.[2]

Rise of the Gig Economy, Crowdsourcing and Alternative Staffing Models

Beyond the shift of responsibilities affecting the workplace is the changing workforce ecosystem. "On-balance sheet" talent is no longer the only form of staff in the workforce. Types of employment are becoming more diverse, with an influx of gig workers and crowdsourced labor. To staff complex financial service roles, companies are more often considering freelancers and contract employees to perform the work. In the United States, for example, more than 40 percent of employees work under alternative staffing arrangements, and this number is steadily rising.[3] Along with the types of employment available, staff members desire flexible working hours, the capability to work remotely, and the ability to take time off for personal reasons when workloads are low.

Several external factors are driving this disruption in the workforce. The increased expectations and demands of workers from their employers, coupled with shifting social values regarding work-life balance, are altering the perspective of workers. The opportunity to use telecommunications, remote meeting spaces, and other technology-driven mediums provides workers with more flexibility. Many employees are also working on teams across time zones, requiring them to adapt to both time and space. In addition, businesses are seeking to expand their current capabilities with minimal impact on costs. With the ability to hire nonsalaried personnel, employers can tailor their workforce to meet their own business goals and the needs of their employees.

The use of alternative staffing arrangements within the actuarial profession is appealing, particularly for non-recurring projects and data-driven work. Many firms utilize external platforms to seek crowdsourced solutions. For example, a competition-based platform can

[2]National Center for O*NET Development. Details Report for: 15-2011.00—Actuaries. O*NET Online, (accessed December 7, 2025).

[3]Jeszeck, Charles A. Contingent Workforce: Size, Characteristics, Earnings and Benefits. Letter from the U.S. Government Accountability Office, April 20, 2015, (accessed December 7, 2018)

facilitate input from various industries and sectors to address complex challenges.

Impact of Technology

In addition to reconsidering who performs the actuarial work, companies are seeking to utilize new technologies to change how actuarial work is conducted. The accessibility and availability of technology are rapidly transforming the way information is processed and work is completed. Along with these changes, the volume and robustness of data are shaping how actuarial and data analysis work is performed. Robotics processing automation (RPA) is systematically advancing the way work is done by applying rules-based actions across platforms to complete repetitive tasks. Natural language generation (NLG) goes beyond that to mimic human judgment by generating tools that utilize both a dataset and business rules to draw conclusions. Predictive analytics and cognitive automation augment human intelligence by utilizing big data, enabling stronger analysis of the large influx of data generated daily.

Due to the surge in the scope and availability of data, employers are demanding an increased level of granularity, greater quantity and quality of analyses, and higher productivity at lower costs. Employees are expected to perform at a faster and cheaper rate with greater accuracy, while focusing their judgment and analysis on high-risk issues. There is a push for employees to utilize technology in areas that require lower cognitive skills and to appropriately allocate their time and resources to areas of higher-level strategic thinking—expanding the capabilities of the professional to further drive performance improvements. Many companies are in the middle or ahead of this fundamental shift within the workplace. According to Deloitte's 2017 Global Human Capital Trends report, 31 percent of companies are implementing robotics and automation, while 34 percent are piloting such processes.[4]

Actuaries are using these revolutionary technologies to strategically improve the roles they perform. Technology enhancements will likely be embedded within each layer of work actuaries carry out. Any repetitive exercises, such as rate filings, data entry, in-force file processing, formulaic calculations, or even collecting data from the web, can be done within a computer-coded software. Automating data preparation is simplified by utilizing data wrangling modules and valuation functions to improve accuracy and efficiency. For data analysis, diagnostics,

[4]Schwartz, Jeff, Laurence Collins, Heather Stockton, Darryl Wagner, and Brett Walsh. The Future of Work. 2017 Global Human Capital Trends. Deloitte, February 28, 2017, (accessed December 7, 2018)

predictive analytics, and cognitive assumption testing, actuaries utilize computerized procedures within specialized programs—enabling the synthesis of data in a condensed amount of time. Lastly, utilizing NLG, actuaries can report and validate memos and project visualizations of data.

Every actuary needs to ask themselves this question: Do I have the digital fluency, communication, leadership, interpersonal, and critical-thinking skills that will be expected of the future actuary once routine processes are automated and removed from my day-to-day work? And companies need to ask themselves: How can we equip our actuaries with the skills they need to succeed in the workplace of the future, especially those who are decades into their careers? Training may need to come from a combination of company-led and external education to round out the skill sets required.

Competition as an Emerging Driver of Change

As the nature of the workforce changes for actuaries, they can take on positions outside of traditional actuarial roles and look to provide value in other analysis-driven activities. For example, insurance companies are now looking to integrate data science skill sets into their organizations to implement advanced analytics capabilities, such as machine learning and predictive modeling, to help improve key actuarial functions—especially in underwriting, in-force analytics, and potentially in reserving.[5] The growing amount of data available has allowed insurance companies to find potential in combining multiple data sources to enhance customer and business insights. These trends have introduced more sophisticated tools and techniques to help analyze the data and understand how to optimize its utilization.

Actuaries have traditionally assumed the role of performing data analysis within insurance companies to manage future risk and uncertainty, as they possess strong quantitative and problem-solving abilities developed through extensive training in mathematics and statistics. While actuaries have experience in executing robust, standardized, and proven problem-solving approaches, there tends to be a lack of training and focus on computer programming, data mining techniques, and analyzing unstructured data.[6] To exploit the data analytics opportunities

[5] PwC. How Do Actuarial and Data Science Skills Converge at Life Insurers? PwC, March 2018, (accessed December 7, 2018)

[6] Shah, Sooraj. Rise of the Data Scientist in Insurance. Raconteur, April 26, 2018, (accessed December 7, 2018)

to the fullest capacity, more advanced skills are necessary, and actuaries can develop these skills to move into more machine learning and predictive modeling work. Some actuarial employers already expect prospective actuaries to possess more advanced programming capabilities and knowledge in statistical modeling.[7] Due to the rigorous quantitative and technical training they already undergo, actuaries are in a prime position to take advantage of these data-science opportunities as the demand for these abilities continues to rise.

In addition to the expansion of desired technical skills and the movement toward integrating data science capabilities, there is also an increased awareness of the value and applicability of the actuarial skill set outside of traditional insurance roles, especially as technological advancements become more integrated across industries and technical backgrounds are in demand. For example, actuaries have expanded into the technology industry, holding actuarial roles at companies like Uber, as well as non-actuarial roles such as risk management.[8] [9]

Companies are looking to employ more analytically rigorous and sophisticated techniques to manage risk and uncertainty. The business objective of an actuary's work is to "put a price on risk," and although the insurance industry has been a natural application, this broader mindset of placing a value on risk can be applied across industries. Actuaries can capitalize on this opportunity and move into nontraditional roles in industries such as telecommunications, consumer services, retail, and technology. The resulting transformation of the actuarial talent pool and extension of actuarial skill sets can open the door to a greater number of possible career trajectories for the profession.

Change Is Here

Change is inevitable and all-encompassing when it comes to the future of the actuarial profession. To stay at the forefront of these changes, employers may need to modify the training, workload, benefits, and roles for actuaries, and actuaries should adapt their skill sets and abilities to the shifting demands of the profession. By adapting to the times rather than remaining steadfast in old ways, companies and actuaries can leverage this technological and social evolution to their advantage.

[7] Priest, Colin. Are Actuaries Competitive in Data Science? The Actuary, December 7, 2017, (accessed December 7, 2018).

[8] Smith Hanley Associates LLC. An Actuary Works Where?! Smith Hanley Associates LLC, July 12, 2018, (accessed December 7, 2018).

[9] Casualty Actuarial Society. This Actuarial Life: Non-traditional. Casualty Actuarial Society Student Central (accessed December 20, 2018)

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Actuarial Science Foundations Module

Ripe for Retirement: How and When Will People Retire in the Future?

The following article is a reprint of Anna Rappaport, "Ripe for Retirement: How and When Will People Retire in the Future?" The Actuary, vol. 12, issue 4, August/September 2015.

The last 150 years have witnessed dramatic changes in the demographic makeup of populations worldwide and in the lives of older individuals. The combination of people living longer and lower fertility rates (plus immigration in some countries) has resulted in a significantly different population age mix. Retirement has become an accepted part of the life cycle in many countries. This is the result of people living much longer than in earlier centuries and the development of public and private retirement systems in many countries. Retirement timing is typically described as a fixed age, rather than based on the time remaining until the expected end of life. Since the inception of retirement programs, retirement ages have decreased significantly and then increased slightly; retirement periods have increased dramatically and continue to rise.

There are huge differences in when people retire and in the retirement expectations of different population subgroups. In the United States, police officers and firemen retire very, very early; teachers retire early; and employees of major companies tend to retire in their 60s—while judges, symphony conductors and members of Congress often work into their 80s. Work is increasingly viewed as a part of retirement, and many people incorporate some form of work into their retirement plans. Some businesses have programs to support the employment of older workers, but they are the exception. "Phased retirement" is the term commonly used for making a gradual exit from the labor force.

There has been considerable discussion about retirement systems, accompanied by numerous changes, with a significant focus on the shift from defined benefit (DB) to defined contribution (DC) plans. There has not been enough discussion of the question: How and when will

people retire? There has been an inadequate focus on the policy and program changes needed to drive retirement patterns that are sensible in light of emerging demographic and societal trends. This article addresses the question of how people decide to retire, the programs that help individuals transition into retirement, and related policy issues. I hope that the article will encourage actuaries to consider these issues, take an active role in thinking about the necessary changes to adapt to emerging demographics, and advocate for significant policy adjustments. It is essential for actuaries to take leadership positions in these areas of public discussion, as many people prefer the politically popular approach of avoiding changes to the retirement age.

Example 1: Findngs Melbourne Mercer Study THE MELBOURNE MERCER GLOBAL PENSION INDEX grades retirement benefit systems around the world, focusing on three major types of factors: adequacy, sustainability, and integrity. For each country, the total system, including social benefits and private pensions, is considered, along with legislative requirements.

This work builds demographic realities and includes labor market participation at older ages as well as benefits. It also includes areas for improvement, both generally and by country. The 2014 report lists six common challenges. The first two are:

"The need to increase the state pension age and/or retirement age to reflect increasing life expectancy, both now and into the future, and thereby reduce the level of costs of the publicly financed pension benefits."

"The need to promote higher labor force participation at older ages, which will increase the savings available for retirement and also limit the continuing increase in the length of retirement."

Several factors related to retirement age are considered in the sustainability section of the analysis. The question is asked: "What is the current gap between life expectancy at birth and the state pension age?" The answers provide an indication of the average period of pension payments. Their analysis for 2014 shows a range from -2.9 in South Africa and -7.3 in India to 19.7 in France and 21.4 in South Korea.

The study also examines the question: "What is the labor force participation rate for those ages 55–64?" The percentages ranged from 40.1 percent in South Africa and 42.0 percent in Poland to

72.6 percent in Switzerland and 76.8 percent in Sweden. They point out the importance of increasing labor force participation.

Retirement Age Trends

The Organisation for Economic Co-operation and Development (OECD) publishes data on labor market exit, indicating retirement age trends in more than 30 countries. Retirement ages vary significantly by country. In almost all OECD countries, the effective retirement age has declined substantially since 1970; however, this trend has been reversed more recently. Over the past decade, the average retirement age has flattened out and is now followed by a small increase. Nevertheless, the effective retirement age remains significantly lower than the levels of the 1960s and 1970s in most OECD countries (exceptions include Japan and South Korea).

Example 2: For men, the average effective retirement age fell from 68.6 in the late 1960s to 63.5 in the five years prior to 2009. For women, the average age of labor market exit dropped from 66.7 to 62.3 over the same period.

Evaluating International Practice—A Comparison of Eight Countries

The Department for Work and Pensions in the United Kingdom commissioned a variety of studies to examine population aging and retirement. One of the papers compared mandatory retirement practices in eight countries. Of the eight, four prohibited mandatory retirement generally, three permitted it after a minimum age, and one permitted it with no age requirement. The exhibit below presents selected data from this report, which includes a more comprehensive analysis. Some of my conclusions after looking at these reports are:

- The demographic issues across countries have many common threads, although some countries are aging much more rapidly.
- Older worker employment and longer retirement are important elements of addressing the aging population's issues. There are both similarities and differences in how they are addressed in different countries.

- Social insurance program provisions are generally important, as are employee benefit plan provisions when employer-sponsored programs are a significant part of the retirement security package.
- Employment at older ages is also important, and there is no agreed-upon way to address facilitating older worker employment.
- Public policy has a big influence on the solution, and it is complex and interwoven.
- It is difficult to raise the retirement age.

Key Points: Definition of Retirement, Working in Retirement, and Retirement Ages

Underlying Demographics

It is essential to note that increases in life expectancy vary by economic status, education, and other factors. One of the troublesome aspects of this issue is that the situation for middle-class professionals differs significantly from that of laborers.

Demographic issues encompass a combination of mortality rates, life expectancy, and fertility rates. As we consider the future of retirement and the economy, dependency ratios — the balance between those working and those not—remain an important issue. The demographic balance has shifted in most countries, and while European countries and Japan have some of the oldest populations, certain developing countries have experienced more rapid demographic changes.

Definition of Retirement

There is no uniform definition of retirement. It can be viewed as the age at which benefits are received, such as leaving a long-term job, exiting full-time employment, or retiring from the labor force. The appropriate definition will vary among different stakeholders, and it is continually evolving. Retirement today often involves some work, typically on a part-time basis.

Retirement Ages and Expectations

There are vast differences in retirement age and expectations about retirement by country and by occupational group. Social security system provisions will be important factors in retirement ages in most countries, as well as any regulations about mandatory retirement.

Many social insurance systems have increased retirement ages, but periods in retirement are still increasing. Retirement age provisions in employer-sponsored DB plans can also be major contributors. DC plans are much less likely to include provisions that have driven retirement ages. Research has repeatedly shown that people expect to retire later than they actually do. For example, the 2013 Society of Actuaries (SOA) Retirement Risk Survey revealed that the median age of retirees surveyed was 58, whereas the median expected retirement age of pre-retirees was 65. In the United States, both involuntary and "pushed" retirement are important factors in retirement decisions. SOA focus groups (in conjunction with the survey mentioned above) indicated that much "voluntary" retirement is "pushed." Reasons people are pushed into retirement include unpleasant job circumstances, family needs, and health problems. There are numerous policy issues associated with retirement timing and the options that employers offer. Factors influencing retirement decisions include social security systems, pension and other benefit plans, having enough money to retire (although this is not always an issue), family decisions (when a spouse retires), the need to provide care and help to other family members, health issues, problems at work, and pursuing dreams.

The Path to Retirement, Phased Retirement and Working in Retirement

Bridge jobs are jobs between career long-term jobs and total exit from the labor force. Economists have studied bridge jobs and found that they have been a part of the process of exiting the labor force since approximately 1990. Some people would view bridge jobs as a form of phased retirement.

Phased retirement and working in retirement are issues of growing importance. Most phased retirement today is not the result of a formal program. Rather, the most phased retirement is informal, consisting of people retiring from one thing and working on another basis later. Individuals are inventing their own paths. The reasons often given for working in retirement are split between the need for financial security and benefits, and the desire to stay engaged. In the United States, access to health insurance has been a major factor. Formal phased retirement programs need more attention. In the United States, a new program for federal workers has encouraged more focus on this topic. Phased retirement means different things to different people, and numerous issues are involved in designing such a program. In 2008, phased retirement was a topic for a major study by the US Department

of Labor's ERISA Advisory Council. The report included some principles for phased retirement that should be helpful in developing sensible structures and policies.

It is worth noting that some older individuals are highly employable, while others are not. Factors contributing to the employability of older persons include flexibility, attitude, skills, keeping them up-to-date, familiarity with technology, the ability to work with individuals of all generations, health, and physical capability in relation to job requirements. It has been pointed out that while some older people are very flexible and great workers, others are inflexible, cranky, and act as if they are entitled.

Building a Life Portfolio

It is important to have both a financial portfolio and a life portfolio. The life portfolio consists of the activities and interests that one has. Ideally, the life portfolio will be driven by passion. It may consist of activities that started before or after retirement, and may include volunteer work, board service, some paid work, family time, artistic endeavors, hobbies, sports, travel, time with friends, and/or learning something new. I often discuss with people what leads to "success" in retirement. Financial matters are vital, but once they are in order, the life portfolio is also very important. I believe that every individual has an internal set of values that defines what is important to them. My measure of success and the life portfolio is that every year, the retiree can say they have accomplished something of value based on their personal value system. The stronger an individual's personal passions are, the more likely it is that he or she can accomplish something related to his or her passions.

Link Between Retirement Ages and Plan Design

Indexing retirement ages to increased longevity is viewed as a logical step; however, it is rarely implemented in public or private retirement systems. Additionally, considering retirement ages in terms of the expected retirement period versus the actual retirement age makes sense, but is rarely done. Traditional DB plans typically encourage retirement at a specific age or within a defined age range. Incentives for retirement are part of DB plan design, and many DB plan sponsors historically used early retirement windows.

DC does not encourage retirement at any particular time. With DC primary plans, many people are reluctant to retire, and some employers are finding that this is creating workforce management challenges. This

may be partly due to inadequate funds. to options for working longer, older worker employment, and phased retirement. Policy can either enable or create barriers for innovation in older worker employment.

Policy and Societal Issues and Retirement of the Future

Public policy plays a significant role in influencing retirement decisions. This is an area where actuaries can make significant contributions to discussions and offer leadership in promoting desirable change. There are several areas of policy that are linked to social benefit retirement ages, benefit structures, and benefit adjustments based on the claiming age that should be reviewed. These define when retirement and disability social benefits can be claimed and how benefits are adjusted based on claiming ages. This is a significant factor in many retirement decisions and in the eligibility for claiming disability benefits.

Employment legislation should also be reviewed, including provisions related to age discrimination and mandatory retirement. Some of the provisions designed to protect workers may make creative options during retirement more difficult.

Of course, any policy review should include employee benefit regulations. This includes the types of entities that can sponsor plans, what provisions are required, and possible support for phased retirement. Benefit plan laws and regulations may include provisions regarding the normal retirement age, payment of benefits while still working, and suspension of benefits upon returning to work, among others. In any country where there is work to expand options, a comprehensive review of all of these regulations and how they support or deter innovative options for older workers would be most helpful. A multidisciplinary group representing diverse stakeholders (including actuarial input) will be needed to effectively address a long list of practical and philosophical questions, and the group will need to understand that compromise is necessary.

Conclusions and Opinions

Societal aging is a global trend affecting many countries. Over the past 50 years, the average retirement period has increased significantly. Recent increases in retirement age have not offset the increases in life span. If retirement systems are to be sustainable, further increases in retirement ages are vital. However, this can only happen in a way that works well

for individuals if there are reasonable opportunities to make longer work feasible. Flexible work options and phased retirement support longer work, but there are few formal programs available today. I believe it is important to actively address these issues.

Raising retirement ages and social benefit eligibility has both pros and cons. Critics of proposals to raise retirement eligibility point to the significant differences in life spans across socioeconomic groups, with lower-paid groups experiencing considerably shorter life spans. It is much more difficult for people in occupations requiring heavy physical labor to work longer. Some critics view such increases as discriminatory against such groups. Raising retirement ages will also lead to some increases in disability, and this will require adjustments to disability benefits so that the disability and retirement programs work well together.

Another criticism of potential increases in retirement ages is that older people often face significant difficulties securing employment, and there are frequently no suitable employment options available. Flexible employment can be beneficial when available. Age discrimination is a subject of government regulation in many places, but that does not necessarily eliminate the problems. The private sector has largely avoided dealing with this issue directly, in part by shifting from DB to DC plans. DB plans make very explicit what they expect about retirement age, but DC plans do not. Some organizations have directly created employment options, while many have not.

I believe that we should reframe the way we think about retirement eligibility in terms of periods in retirement, with the fundamental goal of keeping these periods fairly stable. If we are to do this, we need to be much more aggressive in enabling employer options for older workers. I also believe that we should consider disability benefits in the design of future programs. Public policy has a significant impact on retirement ages and work opportunities for older individuals in various ways. The policy may be part of multiple laws that are not necessarily well coordinated. It is essential for policymakers and the private sector to collaborate in addressing these issues holistically. In so doing, disability policy also should not be forgotten. My experience is that many professionals who have studied these issues understand the importance of addressing them. However, many in policy communities prefer not to address them or take a position of supporting no change. This is an opportunity for actuaries to get more involved with policy.

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