

Communicating Longevity Risk: Beyond the Definitions

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Abstract

Despite persistent efforts to educate and communicate about longevity risk and its potentially harmful effects, the marketplace for longevity risk mitigation solutions has been slow to develop. We propose that, in part, the problem stems from the lack of a common definition and the resulting lack of a consistent understanding of longevity risk. We examine and critique various definitions used by financial and policy communities, as well as the public at large. Finally, we suggest that a concerted effort to address this semantic murkiness is an essential ingredient for the success of marketplace solutions and broader public policy initiatives.

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Communicating Longevity Risk: Beyond the Definitions

'When I use a word,' Humpty Dumpty said in rather a scornful tone, 'it means just what I choose it to mean -- neither more nor less.'

'The question is,' said Alice, 'whether you can make words mean so many different things.'

'The question is,' said Humpty Dumpty, 'which is to be master - - that's all.'

-- Lewis Carroll, Through the Looking-Glass

Introduction

Despite the well-intentioned effort to raise awareness of longevity risk in both the financial community and with the public at large, the concept of longevity risk remains elusive. It has proven to be a difficult concept to communicate. Longevity risk seems to take on a different meaning depending on the context. What do we mean when we say “longevity risk”? Is there a master definition, as Humpty Dumpty would ask, that trumps all the others?

Consider the following statements:

“If retirement assets are able to achieve higher rates of return, then longevity risk will be reduced.”

“Pension plan sponsors realize the magnitude of the pension plan’s longevity risk when the pension liabilities are measured using realistic mortality improvement assumptions.”

“When asked about longevity risk, the survey participants indicate that declining health is their number one concern.”

“Can individuals purchase longevity bonds or other capital market instruments to hedge against their longevity risk?”

The validity of the above statements depends on what is meant by longevity risk, and in each case longevity risk appears to take on a different meaning. These examples are illustrations of what we perceive to be two related problems:

The multiple meanings of the term longevity risk create barriers in communication.

Individuals and institutions often misunderstand the nature and characteristics of longevity risk. This impedes the understanding and acceptance of the various so-called longevity risk solutions.

Regardless of the context, people’s behaviors are influenced by their perceptions and presuppositions about longevity and about risk. If we want to optimize the effectiveness of longevity risk solutions, we first need to appreciate how people understand longevity risk. A risk management theory from social anthropology, called plural rationality, may offer helpful insight into the different perspectives on longevity risk – and so may be useful in addressing the communication and understanding gaps.

In this paper we will examine:

- The various meanings of longevity risk
- Some presuppositions and implications about the nature of longevity risk
- Four different “worldviews” of longevity risk as suggested by plural rationality theory
- Suggestions for moving forward

What Do We Mean by Longevity Risk?


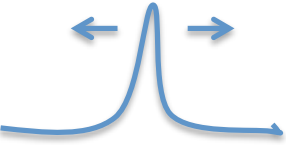
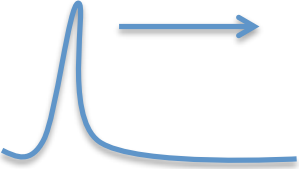
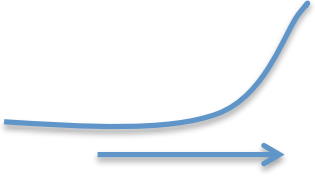
What is longevity risk? How is the concept of longevity risk communicated?

Longevity refers to a long life.¹ So, in general, longevity risk may be construed as risk associated with a long human life. Our scanning of public discussions and writings on this topic reveals four broad categories of meaning as suggested here.

- Longevity risk as individuals outliving their financial resources (also called individual or idiosyncratic longevity risk);
- Longevity risk as mortality improving more than expected, or uncertainty about future mortality improvements (also called systematic, aggregate, or pooled longevity risk);
- Longevity risk as the additional cost to a society or, more narrowly, a pension system, when mortality improvements are underestimated;
- Longevity risk as the adverse consequences of living a long time.

These four categories suggest four frames in which longevity risk may be understood. We depict these four frames by the curves in the table below.

¹ Definition from the Oxford Dictionary.

Representation	Description	Common Symptoms
	<p>Individual Longevity Risk: variability in an individual's lifespan</p>	<p>Outliving one's retirement assets</p>
	<p>Pooled Longevity Risk: uncertainty in mortality improvement</p>	<p>Uncertainty in a pension plan's benefit payments due to mortality; inability to manage all risks in a pension system</p>
	<p>Additional Cost to a Society or a Pension System when Mortality Improvements are Underestimated</p>	<p>Underreporting of pension and retiree health liabilities; much higher financial burden than expected in a country's social insurance program</p>
	<p>Adverse Consequences of Living a Long Time</p>	<p>Health risks, inadequate retirement savings, risk of elder abuse, loss of companionship, long-term care needs, and other problems associated with a long life</p>

We now examine each of these four frames in more detail.

Individual or idiosyncratic longevity risk

A common use of the term longevity risk is to describe the likelihood of an individual outliving his or her financial resources, or his or her failure to leave behind intended bequests due to increased lifetime spending. Employing the term "longevity risk" here is an essential ingredient in building the case for the purchase of annuity products and other lifetime income solutions.

Typically, the discussion begins with an assertion about a retiree’s life expectancy, and is followed by an assertion that there is a significant probability that the retiree will outlive his or her financial resources. This probability is then defined as longevity risk. Used this way, longevity risk is an individual risk, also known as idiosyncratic longevity risk. It is distinct from systematic longevity risk, which is associated with the pooling of individual risks.

Here are two examples of this usage:

The United States government has announced steps to make it easier for families to save for retirement. In attempting to promote greater public understanding of lifetime income needs, the government defines longevity risk as the risk of retirees outliving their assets:²

Particularly as the baby boomers approach retirement, and as life expectancies and retirement periods lengthen, Americans are increasingly confronting the risk of outliving their assets in retirement (“longevity risk”) and are seeking more help and better strategies for managing their savings in retirement.

Similarly, financial advisors promote lifetime income product solutions in news articles and online blogs by referring to longevity risk as the risk of outliving one’s assets. A typical example is Fidelity Investments’ discussion of annuitizing a portion of one’s retirement portfolio:³

Annuitizing a portion of your portfolio can provide a source of guaranteed income that may help protect you against longevity risk—the risk that you will outlive your money.

Notice that this use of the term longevity risk is closely aligned with a consequence of longevity: outliving one’s assets. This consequence is a financial concern. Assuring that one’s retirement assets last a lifetime will be directly impacted by the length of the planning time horizon, but it also depends on other factors such as asset allocation and investment returns. To understand how longevity impacts the likelihood of outliving ones’ assets, retirees need to understand and appreciate the variability of their own life span.

² “Treasury Fact Sheet: Helping American Families Achieve Retirement Security by Expanding Lifetime Income Choices”, United State Treasury, p.1.

³ “Don't take a lifestyle cut in retirement: Five ways to help close your income gap, no matter what your age”. Fidelity Viewpoints. Available <https://www.fidelity.com/viewpoints/retirement-readiness>

The main characteristic of individual longevity risk is the variability of the individual lifespan. For example, the following realities can be readily calculated from standard mortality tables, but these realities are seldom communicated to retirees.

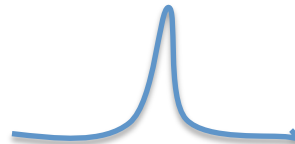
- The standard deviation of the life span of an individual age 65 is between nine and ten years. Translated: there is a wide range of death ages for an individual age 65.
- For an age 65 retiree with a life expectancy of twenty years, the probability of dying at the life expectancy age is less than 4.5%. Between age 80 and 90, where the retiree is most likely to die, the probably of dying during any one year of age is approximately 4%.



We represent individual longevity risk by a curve with wide variability (a “Flat Curve”). The arrow below the curve represents the fact that an individual’s actual life span can be either longer or shorter than expected.

When financial advisors ask retirees to consider life expectancy, they unintentionally steer retirees toward the concept of “expected value” and away from the concept of “variability.” While unable to articulate the concept of lifespan variability, retirees inherently have a strong sense of the variability of their remaining life based on their personal circumstances and life experiences.

So, while the financial advisor communicates this:



The retiree’s experience and picture is actually this:



This disparity in concepts creates confusion for the retiree and may undermine the credibility of the financial advisor in the eyes of the retiree and dampen the effectiveness of the financial advisor’s message.

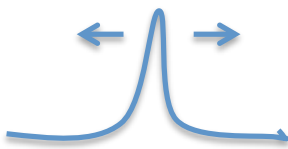
Pooling is generally thought to be the most effective means of dealing with the variability of the individual life span. While the timing of an individual death is highly variable, the timing of deaths taken collectively for a large group becomes

more and more predictable as the size of the group increases. Individuals benefit from the collective management of individual longevity risks.

Systematic or aggregate longevity risk (pooled individual longevity risk)

Assuming that individual longevity risks have been pooled, what remains is usually called systematic longevity risk (also called aggregate longevity risk or trend risk). Systematic longevity risk is the risk that actual mortality experience of the population in question differs from what is expected. This difference arises because of uncertainty associated with future mortality improvements; these improvements can potentially be higher or lower than expected.

In the context of a typical mortality table, an individual life span may vary according to the table's probabilities of death. However, the mortality table itself changes each year in uncertain ways. The risk associated with uncertain future mortality tables is the systematic longevity risk.



We represent systematic longevity risk by a curve with much less variability (a “Skinny Curve”). The arrows represent the uncertainty in the mean. The curve does not represent lifespans, but is meant to illustrate more predictability in the aggregate.

Pooling to manage the variability of individual lifespans is what an economist would call a “diversification free lunch”, but such a device is not available to manage systematic longevity risk. Systematic longevity risk is usually dealt with by transferring the risk to others more capable of bearing such risk. A pension plan can transfer its longevity risk to an insurer, to a counter-party in a longevity swaps transaction, or to issuers of longevity bonds. When a pension plan or an insurance company is unable to transfer or share the systematic longevity risk, it may encounter financial surprises resulting from unexpected levels of benefit payments in future years.

Ultimately, society as a whole underwrites this systematic longevity risk because other societal structures absorb this risk. Social insurance systems, future tax receipts, the economic productivity of future generations, and bequeaths from the current generation to the next generation are all vehicles through which this risk is absorbed. It is intergenerational in nature because the resources eventually available to the next generation will be adjusted to reflect the degree to which the current generation's living standard is maintained.

Longevity risk as the adverse consequences of underestimating mortality improvements

When economists, demographers, actuaries, and policymakers speak of longevity risk, they often are referring to the degree to which the costs associated with an aging society are understated. The magnitude of such understatements might be estimated, for example, by comparing the life expectancy improvements in the last century with the estimated life expectancy improvements for the next 30 to 50 years that are built into current cost projections. Increasing life expectancy puts pressure on a country's social security, pension, and healthcare systems. When life expectancy improvements are understated, future governments are burdened with unexpected fiscal pressures.

The logical response to this sense of longevity risk focuses on using robust life expectancy improvement assumptions in fiscal analysis, and on taking steps to lessen adverse financial impacts in case the life expectancy improves much more than expected.

An example of this is the International Monetary Fund's (IMF's) 2012 report on longevity risk and its financial impact.⁴ The IMF defined longevity risk as "the risk that actual life spans of individuals or of whole populations will exceed expectations."⁵ Their approximations of financial impacts are based on an expectation of a longevity "shock" of three years by 2050. Three years was chosen because it approximates the average underestimation of longevity that has been observed in the past. The economic cost of maintaining retirement living standards was split into three components: the cost at the 2010 level, the additional cost due to projected longevity improvements from 2010 to 2050, and the additional cost due to a three-year shock to longevity.⁶ The report then discussed financial and policy implications.

The report is careful in its choice of terms. The term longevity shock is chosen to distinguish it from longevity risk. Looking beyond the definitions, what we find is that the message being communicated is not the uncertainty or variability of future mortality improvements, but the potential adverse financial impact of longevity understatement. For example, the report states:⁷

Still, higher longevity at younger ages is clearly not a risk. Longer healthy and productive lives (before retirement) add to incomes, retirement savings, and tax revenues.

⁴ 'The Financial Impact of Longevity Risk', Chapter 4 of Global Financial Stability, IMF Report, International Monetary Fund (2012).

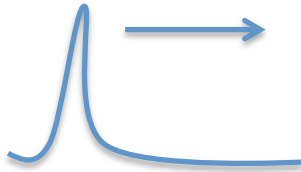
⁵ *ibid.*, p.3.

⁶ *ibid.*, p. 8.

⁷ *ibid.*, p. 6.

Thus, if no adverse financial impact results from the longevity improvements of productive younger workers, then there is no longevity risk associated with them.

This sense of longevity risk is often used in the context of Social Security and the underreporting of pension liabilities.



We represent this notion of longevity risk as a curve skewed to the left (a “Skewed Curve”). The arrow represents the direction of a presumed “correction” to the understated mortality projections.

This picture captures the concern of many policymakers and pension plan sponsors regarding longevity risk: the potential adverse consequence of a longevity shock. Therefore the response to this notion of longevity risk involves using more robust mortality improvement assumptions and more robust stress-testing scenarios in any analysis of long-term system costs.

Longevity risk as the adverse consequences of living a long time

Our final perspective on longevity risk is broader, and in many ways, more personal. For example, in a recent paper by American Academy of Actuaries on lifetime income, it states:⁸

A significant concept underpinning lifetime income is “longevity risk,” which has many dimensions and includes the increasing life expectancies of retirees and their spouses, and conceptions and misconceptions of life expectancy and its implications. Longevity also includes the risks of declining health, loss of ability to manage finances, and loss of independent living. A very important longevity risk is lifetime income risk. Individuals who underestimate their likelihood of living into the older ages could deplete their assets well before the end of life.

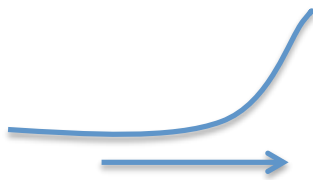
The sense of longevity risk here includes other risks associated with a long human life, not just financial risks. We see various needs of the elderly increase with age, among them, the need for medical care, the need for reliable income for living expenses, the need for caretakers, and the need for family and companionship. In this context, longevity risk represents the extent to which such needs may not be met as an individual ages.

⁸ “Risky Business: Living Longer Without Income for Life”, American Academy of Actuaries, June 2013, p.3.

Another example of this perspective can be found in the report “Longevity Risk and Reward for Middle-Income Americans” by Bankers Life and Casualty Company Center for a Secure Retirement:⁹

Comparing all longevity risk, half (57%) of middle-income Americans age 55 and older are concerned about declining health, followed by a lack of money to do things in retirement (47%), lack of energy (46%) and outliving their savings (44%).

In that study, 500 middle-income American were surveyed and asked about their longevity concerns. The term longevity risk was used as a general term for these concerns. The survey results showed that health, not income, was the top longevity concern. The report used a more specific term “financial longevity risk”¹⁰ to describe longevity-related concerns due to insufficient retirement savings.


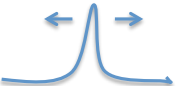

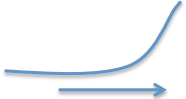


We represent this use of the term longevity risk by a curve that increases over time or with age (a “Rising Curve”). The rising curve indicates the individual’s sense that adverse consequences of aging will grow over time.

Addressing this sense of longevity risk calls for a holistic approach that may include health and long-term care for the elderly, attention to friend and family relationships, management of housing and household affairs, prevention of elder abuse, and the making of end-of-life decisions.

The communication challenge

Considering these four very different notions of longevity risk, it is easy to see why communicating longevity risk is such a challenge.

 <p>Flat Curve Response: risk pooling</p>	 <p>Skinny Curve Response: risk sharing</p>	 <p>Skewed Curve Response: robust assumptions</p>	 <p>Rising Curve Response: well-being</p>
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⁹ “Longevity Risk and Reward for Middle-Income Americans”, Center for a Secure Retirement, Bankers Life and Casualty Company, March 2013, p. 13.

¹⁰ Ibid., p. 16.

Imagine this scenario. A financial advisor first raises the topic of longevity risk with a retiree; that retiree likely has a “Rising Curve” in mind. Forging ahead, the financial advisor then introduces the notion of longevity risk solutions in the frame of the “Skinny Curve.” The puzzled retiree can only envision the “Flat Curve” and confusion reigns. No wonder longevity risk is poorly understood!

Or imagine a pension board discussion about a pension plan’s longevity risk. The pension advisor recommends a longevity risk mitigation solution based on a “Skinny Curve” picture, but the pension board soon realizes that their pension liability is best represented by the “Skewed Curve” picture and struggles to understand why a “Skinny Curve” solution can solve their “Skewed Curve” problem. Shouldn’t they concentrate on the “Skewed Curve” problem first? Meanwhile some older board members begin quietly contemplating their own personal situations: might the “Skinny Curve” longevity risk solution be applicable to their individual “Flat Curve” and “Rising Curve” situations? And do they individually face a “Skewed Curve” problem as well? The result: massive confusion!

In summary, we have described four different notions of longevity risk, each with different characteristics and each evoking different responses. Understanding the frame in which longevity risk is communicated is essential for the successful communication of longevity risk.

More Things to Think About

In the preceding section, we proposed four different frames for understanding longevity risk. We offer these solely for the purpose of revealing the widely divergent uses of the term. There are probably other frames used and we invite readers to offer their comments and additional perspectives.

In this section, we move beyond the definitions to examine some additional relevant factors in the understanding and communication of longevity risk.

Mathematical relationships underlying different notions of longevity risk

The prevailing view in understanding risk among experts and practitioners is the financial economics view. Risk is represented as variability. There is a simple mathematical expression that unifies the individual and systematic longevity risks. Assume the remaining lifetime of an individual is a random variable that follows the probabilities of death in a mortality table, and the mortality table itself is a collection of age-dependent random variables that depend on estimated parameters. Let L denote the remaining lifetime of an individual and P denote the set of estimated parameters. An important identity in the theory of mathematical probability is

$$\text{Var} [L] = E [\text{Var} [L | P]] + \text{Var} [E [L | P]],$$

where Var is the variance, E is the expected value and [. | .] is the conditional expectation over a suitable sample space.¹¹ In words, this identity is commonly stated as

The total variability is equal to the mean of the variability plus the variability of the mean.

Intuitively, the conditional expectation is the mathematical way of saying “holding certain variables constant.” Unpacking this identity, we have

The mean of the variability (E [Var [L | P]]) is the expected variability given mortality rates. That is, the individual longevity risk. With a large group, the ratio of the variance to the mean inside the expected value is reduced due to the law of large numbers. Thus this is a component of variability that can be managed by pooling.

The variability of the mean (Var [E [L | P]]) is the variance of the life expectancy over uncertain mortality rates, i.e., the systematic longevity risk. This component cannot be managed by pooling.

Thus the total longevity risk is the sum of individual longevity risk and systematic longevity risk. This formulation gives the two types of longevity risk a more precise mathematical definition and provides a mathematical framework for calculating them. The calculation of variability is fundamental to the pricing and hedging of longevity risk with longevity swaps and other capital market solutions.

The above identity treats risk as variability (i.e., the “Flat Curve” and the “Skinny Curve” picture). However, the expected level of mortality is also a factor when we speak of longevity risks (i.e., the “Skewed Curve” picture). This happens when the mortality rates have been estimated incorrectly or when inadequate mortality assumptions are used.

Finally we have the possibility that the model specifying the dynamics of the mortality rates is itself inadequate. This is known as the model risk.

¹¹ See for example, “Probability and Measure”, P. Billingsley, John Wiley & Sons, 2012

Combination of different categories of longevity risk

In practice, the longevity risk under consideration usually does not belong to a single category but is a combination of several categories discussed above. The four categories of longevity risks provide a way to think about people's responses to longevity risks. For example, the impact of pooling on mitigating the individual longevity risk in a group of individuals depends on the size and composition of the group. Therefore the aggregate mortality experience for a group may be less predictable than the overall population. Pictorially we visualize this as a spectrum of curves between the "Flat Curve" and the "Skinny Curve." The response to this situation may be a combination of additional longevity risk diversification and longevity swaps.

Furthermore, it is well known that for subgroups of individuals, there are significant variations in mortality experiences and mortality improvements. For example, in the United States, there is a large difference in mortality improvements due to race and educational attainment.¹² When assessing the longevity risk of an individual or a group of certain socio-economic status, a systematic underestimation of the longevity risk may result if the mortality experience for the socio-economic group is not considered. Thus the "Skewed Curve" picture is often combined with the "Flat Curve" or the "Skinny Curve" picture.

The presupposition of maintaining the same lifestyle

Inherent in the longevity risk concept are certain presuppositions. A common presupposition underlying longevity risk is that maintaining the same standards of living amid changes is desirable. If an individual or a society accepts lifestyle changes when circumstances change, maintaining the same living standards may not be the right financial goal. This presupposition is common for most insurance products.

Change and social mechanisms that deal with change influence how risk is perceived. For example, when a family loses its home due to fire, the community may come together to help the family. This is a form of insurance, but the form and the level of help may be quite different from that which is provided through commercially available insurance products. In a society where there is more emphasis on the community and less on the individual, and in a worldview where acceptance of change is more of a norm than an exception, there may be less perceived need to maintain the same standard of living. Thus the need to mitigate longevity risk may not be as strong.

¹² "Differences in Life Expectancy Due To Race and Educational Differences Are Widening, And Many May Not Catch Up", Olshansky, J., Antonucci, T., Berkman, L. et al. 2012.

The presupposition of adverse consequences

Another presupposition of longevity risk is its association with adverse outcomes of longevity. As we have mentioned previously, longevity in a younger working-age population generally improves productivity and economic output. Therefore we don't speak of longevity as being a risk to the younger working-age population.

Should longevity necessarily be associated with adverse consequences? The longevity dividend concept embraces the possibility of a society, not where the elderly become a burden to society, but one in which the elderly contribute to the society in vibrant and meaningful ways.¹³ With the extension of disease-free life expectancy and the possibility of disability compression, healthier and longer lives may create economic wealth rather than economic burden. If this alternate world comes to fruition, the term "risk" will be used less and less often in conjunction with "longevity."


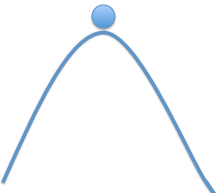
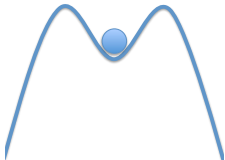

The interplay of presuppositions and worldview brings us to the analysis of longevity risk from the plural rationality perspective.

Plural Rationality and Longevity Risk

Social anthropologists, when studying how a society organizes itself, describe four different ways people perceive the world and view their social relationships. The four worldviews impact how they perceive and understand risk. This theory is called the theory of plural rationality, or the cultural theory of risk.¹⁴ The four perspectives are shown in the following table and described below.

¹³ "In Pursuit of the Longevity Dividend: What should we be doing to prepare for the unprecedented aging of humanity?", J. Olshansky, D. Perry, R. Miller, R. Butler, *The Scientist*, March 2006

¹⁴ "Cultural Theory", Thompson, M., Ellis R., Wildavsky, A., Westview Press, 1990

	Plural Rationality	Longevity Risk Response
	Individualism: values individual freedom, free markets, optimistic economic outlook	Self-insuring longevity risk; market and investment based solutions
	Egalitarianism: strong group identity, sees the world in a precarious state, protect against all risks	Social insurance of all retirement risks (longevity, investment, inflation, healthcare); intergenerational sharing of longevity risk
	Hierarchy: sees the world in equilibrium, but with potential dangers; structures exist to protect against adverse outcomes	Differentiated roles; individuals, family, insurance company, government, and the capital market each have a role to play in mitigating longevity risk
	Fatalism: structures exist, but no group identity; individuals view events as happening randomly; no relevant learning from past experience is possible	No preparation for longevity risk; unable to plan for the long-term

Individualism. The individualists value freedom and markets, and have no group affinity. With respect to economic outlook, they are the optimists and believe that optimal outcomes can be reached in equilibrium. Their reaction to longevity risk is to self-insure. They put more emphasis on investment returns than on longevity risk. A systematic withdrawal strategy (such as the 4% rule) is common from this perspective. Individuals will purchase annuities opportunistically if they perceive potential gain. There is no forced pooling of individual longevity risks to enhance societal welfare.

Egalitarianism. The egalitarians live within a strong group boundary but have no hierarchical structure. Everyone in the group is treated the same. With respect to economic outlook, they view the world as precarious. Any

perturbation of the current state could trigger a total collapse. Thus, efforts are made to conserve available resources at the expense of potential upside. With respect to longevity risk, they favor mandatory conversion of retirement assets into inflation-protected annuities. Longevity risk is pooled and shared equally. Conservative outlooks also favor the collective management of other risks, such as inflation, investment and health risks.

Hierarchy. Those with a hierarchical worldview accept prescribed roles and live within strong group boundaries. Economically, they view the world in equilibrium, but must be protected from many potential dangers. Risks should be managed. They pool longevity risks, and manage them through well-defined social structures. This may involve regulations and policies that facilitate risk sharing and risk transfer to maximize the upside subject to prescribed limitations on the downside. Another attribute of this hierarchical structure is filial piety, in which the younger generation has well-established responsibilities in support of the elderly. Filial piety utilizes the human capital of the next generation to absorb the current generation's longevity risk in a form of conscious, intended intergenerational risk sharing.

Fatalism. The fatalists live in a world with prescribed roles, but without group affinity. Their world is structured, but they feel powerless to influence it. Economically, they view the world as having no discernable patterns. Events occur randomly. Past experiences cannot be extrapolated into the future to predict future events. They keep their outlook short-term, and are unwilling to make long-term commitments. With respect to longevity risk, they do not see a need to mitigate longevity risk because they do not consider any mitigation effort to be successful.

People's reactions to longevity risk are shaped by their worldview. Inevitably, in a society there are people and groups holding different perspectives. When they come together to solve problems of longevity, how do they reach a common solution? How should one entity with one perspective communicate with another entity with a different perspective?

An effective process may be one where all voices are heard and considered. The solution to a problem may not be optimal for any one entity, but may prove to be more stable over time. Under the theory of plural rationality, a solution achieved through this process is referred to as a "clumsy solution."¹⁵

For example, is it possible to introduce hierarchical roles and structures for an individualist? Behavioral economists are proponents of "choice architecture" in

¹⁵ More explanation of clumsy solutions can be found in "Uncertain Times, Plural Rationalities and Pension Fiduciary", Cambridge Handbook of Institutional Investment and Fiduciary Duty, 2013.

retirement plan designs.¹⁶ Retirement plan participants in the United States need to make critical decisions, such as those regarding asset allocation and the form of payment during the decumulation phase. If a default option is carefully placed in a menu of well-chosen options, it will steer the plan participants toward better decisions resulting in better outcomes. All this is accomplished without sacrificing individual choice and individual freedom. These proposals represent “clumsy solutions” that are sensitive to both the individual perspective and the hierarchical perspective. Similar solutions may be possible in the area of longevity risk.

Looking Forward

After analyzing the meaning and the concept of longevity risk, how can we better communicate and understand longevity risk? Here are some suggestions.

Make the concept of longevity tangible

As opposed to other risks, longevity is not something that people experience within a particular time frame. The chance of having an accident, getting sick or dying can be experienced and understood in a specific time frame, but longevity is experienced over a lifetime. People experience longevity not by looking forward into future outcomes, but by looking backward and realizing they have been experiencing longevity all along. Behavioral economists tell us that distant events and events that are mundane and less dramatic leave less of an impression on people’s minds. And, so, people tend to underprice the financial impact of such events (i.e. use a high discount rate to discount such events). Longevity is a distant reality, and communicating longevity involves the challenge of making it tangible--something that can be experienced now. Often, it involves the proper framing of the longevity concept, not necessarily in the most technically correct way, but in the most tangible way for the audience.

An interesting example of making longevity tangible can be seen in a recent television advertisement. In it, several individuals were each asked to think of the age of the oldest person they know. These ages were then plotted on a histogram. The resulting histogram resembled a bell-shaped curve whose highest point was in the mid 90s.¹⁷ The advertisement’s message is this: you will likely live a long life and should seek professional financial help to plan for a long retirement. This advertisement succeeded in making the concept of longevity personal and immediate by asking people the age of the oldest person they knew. This question transformed the abstraction of longevity into a tangible, personal experience. However, what does the histogram represent? The viewer may mistake the histogram for the distribution of future life span. It is not. The precise

¹⁶ See “Nudge: Improving Decisions About Health, Wealth, and Happiness” by Richard H. Thaler and Cass R. Sunstein.

¹⁷ <http://www.youtube.com/watch?v=0Wb2-T6LP0U>

interpretation of the resulting histogram may be difficult, in fact it may be subject to misinterpretation. Regardless of the precise interpretation, the histogram succeeds in making the concept of longevity tangible for the viewer.

Use the four longevity risk diagrams to clarify concepts and messages

To reduce the confusion created by different meanings of longevity risk, the four frames of longevity risk (“Flat Curve”, “Skinny Curve”, “Skewed Curve”, and “Rising Curve”) and the four diagrams of plural rationality (individualism, egalitarianism, hierarchy, and fatalism) may serve as helpful devices to bring communications into sharper focus.

For example, is the main message the risk caused by uncertainty in the mortality assumptions (“Skinny Curve”), or the risk of using inadequate mortality assumptions (“Skewed Curve”) ? If inadequate assumptions are the main problem, then the solution will be to use more robust assumptions. On the other hand, if the main concern is uncertain assumptions, then the solution may be related to how risks are shared and who is best able to bear that risk.

Can individuals use longevity bonds to hedge longevity risk? A product designed for systematic longevity risk (“Skinny Curve”) would be ineffective against individual longevity risk (“Flat Curve”).

Cross-culturally, a solution that makes sense for an egalitarian group that wants to mitigate all old-age risks (“Rising Curve”) may be incomprehensible for individualists who are concerned about the variability in their remaining lifetimes (“Flat Curve”).

Conclusion

To improve communication of longevity risk, one should acknowledge the different meanings, the different perspectives, the different presuppositions and the different worldviews that inform our understanding of longevity risk. Awareness of the frames from which longevity risk is discussed will help us deliver our messages more effectively. Only then can public policies and commercial solutions related to longevity risk be communicated in a way that consumers and the public at large find relevant and meaningful.

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