Lifetime Asset Allocation Solutions

Odeh H. Akkawi, CFA
Senior Consultant

March 23, 2010

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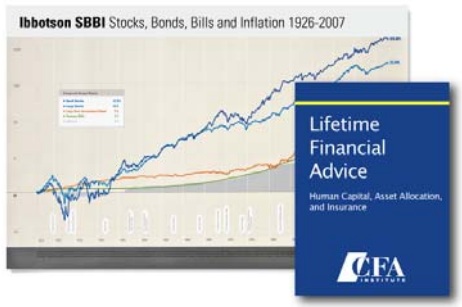
a Morningstar company

Ibbotson Associates Overview



Dedication to innovative research

Founded in 1977 by Roger Ibbotson

Create customized solutions for institutions

Expertise in asset allocation, manager selection and portfolio construction

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a Morningstar company

Leverage two trusted brands

Acquired by Morningstar in 2006

Today

$61.2B
Total Assets

Leading provider of investment advisory services

- $48.0 billion assets under advisement for investment consulting
- $13.2 billion assets under management for managed accounts serving over 9.1 million participants

+100
Clients Worldwide (US, Canada, Europe, Asia)

Experienced investment professionals

- Staff averages 10 yrs investment experience
- Most have either Ph.D., CFA, MBA or combination

6
Graham and Dodd Awards

Award-winning research

- 2 patents granted for asset allocation and human capital
- 75 research papers written or co-authored

Data as of September 30, 2009.

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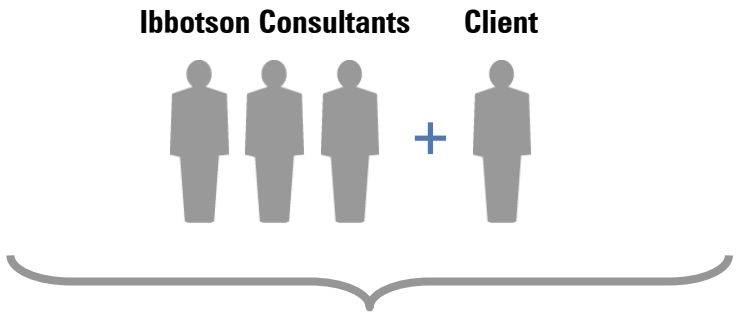
Customized Solutions

Our consultants meet with the client to assess initial need and are involved throughout the process



Our Strengths

Our capabilities can be used separately or in combination to produce customized solutions designed to meet specific client needs

Client Customized Solutions

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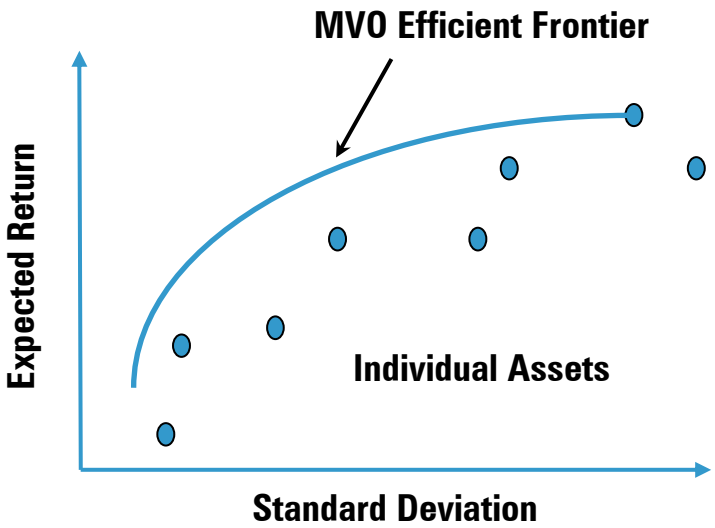
Lifetime Financial Advice

Traditional Asset Allocation Framework in Accumulation



Limitations on Traditional MVO

- Optimizer is sensitive to changes in inputs – leads to large changes in allocations
  - Sensitivity Analysis ➔leads to Ibbotson guidelines
  - Re-Sampling ➔minimizes the output of MVO
- Ignores liabilities on one's assets
  - Liability-driven investing
- Ignores outcomes
  - Investors only care about outcomes
- Ignores longevity risk
- Limited only to financial capital ➔ no consideration of human capital

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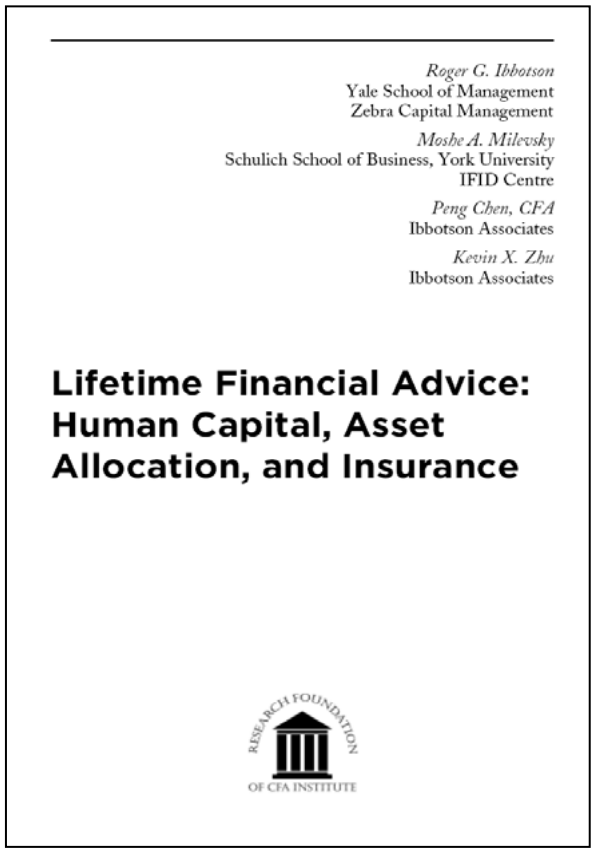
An Approach Based by on Modern Portfolio Theory



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Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance

RESEARCH FOUNDATION OF CFA INSTITUTE

Financial Analysts Journal
Volume 62 • Number 1
©2006, CFA Institute
FAJ

Human Capital, Asset Allocation, and Life Insurance

Peng Chen, CFA, Roger G. Ibbotson, Moshe A. Milevsky, and Kevin X. Zhu

Financial planners and advisors increasingly recognize that human capital must be taken into account when building optimal portfolios for individual investors. But human capital is not simply another pre-endowed asset class; it contains a unique mortality risk in the form of the loss of future income and wages in the event of the wage earner's death. Life insurance hedges this mortality risk, so human capital affects both optimal asset allocation and demand for life insurance. Yet, historically, asset allocation and life insurance decisions have been analyzed separately. This article develops a unified framework based on human capital that enables individual investors to make these decisions jointly.

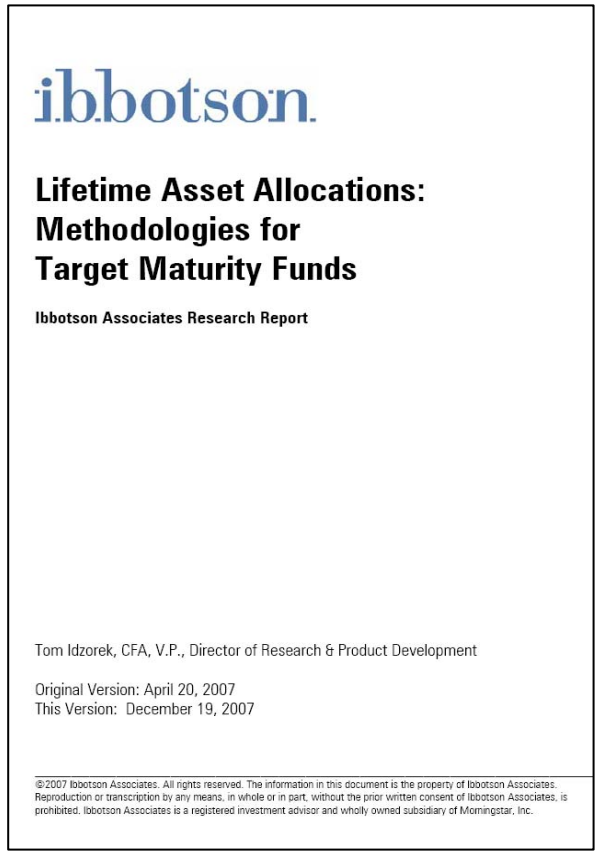
Academics and practitioners increasingly recognize that the risk and return characteristics of human capital, such as wage and salary profiles, should be taken into account when building portfolios for individual investors. Merton (2003) pointed out the importance of including the magnitude of human capital, its volatility, and its correlation with other assets in asset allocation decisions from the perspective of personal risk management. The employees of Enron Corporation and WorldCom suffered extreme examples of this risk. Their labor income and their financial investments in the companies provided no diversification, and they were heavily affected by their companies' collapses.

A unique aspect of an investor's human capital is mortality risk—that is, the family's loss of human capital in the event of the wage earner's death. Life insurance has long been used to hedge against mortality risk. Typically, the greater the value of the human capital, the more life insurance the family demands. Intuitively, therefore, human capital affects not only optimal asset allocation but also optimal life insurance demand. These two important financial decisions are generally analyzed separately, however, in theory and practice. We found few references in either the risk/insurance literature or the investment/finance literature to the importance of considering these decisions jointly within the context of a life-cycle model of consumption and investment. In other words, popular investment and financial planning advice about how much life insurance one should carry is seldom framed in terms of the riskiness of one's human capital. And optimal asset allocation, which has only lately started to be framed in terms of the risk characteristics of human capital, is rarely integrated with life insurance decisions.

Motivated by the need to integrate these two decisions, we merged these traditionally distinct lines of thought together in one framework. We argue that these two decisions must be determined jointly because they serve as risk substitutes when viewed from the perspective of an individual investor's portfolio. Life insurance is a perfect hedge for human capital in the event of death because term life insurance and human capital have a negative 100 percent correlation with each other in the "alive" (consumption) state versus "dead" (bequest) state. If insurance pays off at the end of the year, human capital does not, and vice versa. Thus, the combination of the two provides great diversification to an investor's total portfolio. **Figure 1** illustrates the types of decisions the investor faces, together with the variables that affect the decisions.

The unified model we discuss is intended to provide practical guidelines for optimal asset

Peng Chen, CFA, is managing director and chief investment officer at Ibbotson Associates, Chicago. Roger G. Ibbotson is professor of finance at Yale School of Management, New Haven, Connecticut. Moshe A. Milevsky is associate professor of finance at the Schulich School of Business at York University and executive director of the Individual Finance and Insurance Decisions Centre, Toronto. Kevin X. Zhu is senior research consultant at Ibbotson Associates, Chicago.



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Lifetime Asset Allocations: Methodologies for Target Maturity Funds

Ibbotson Associates Research Report

Tom Idzorek, CFA, V.P., Director of Research & Product Development

Original Version: April 20, 2007
This Version: December 19, 2007

2007 Graham and Dodd Scroll

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The Human Capital Concept

Beyond the Traditional Asset Allocation Framework

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Total Economic Wealth

+

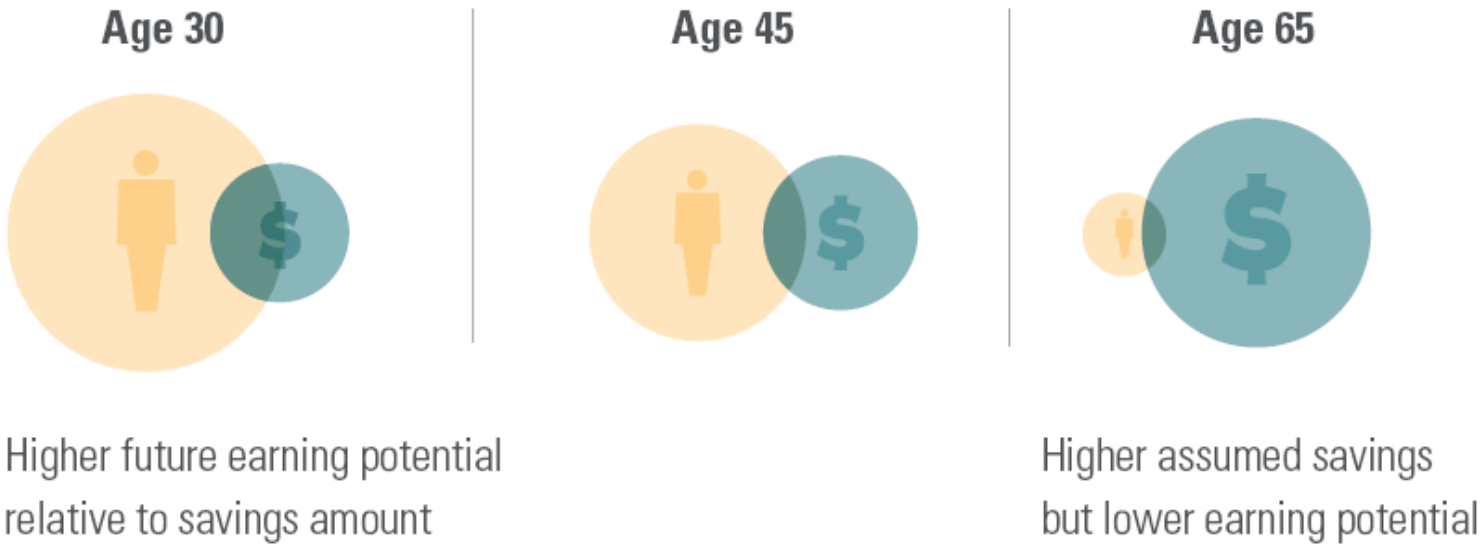
Financial Capital

- Tradable assets such as stocks and bonds have traditionally been used when constructing an asset allocation
- Incomplete without considering Human Capital

Human Capital

- An individuals ability to earn and save
- Present value of all your expected future wages including pension and social security

How the Stage of Your Career Affects Your Human Capital



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Are You a Stock or A Bond?

Comprehensive Asset Allocation with Human Capital: Is Your Client a Bond or a Stock?

By: Moshe A. Milevsky[1], Ph.D.

The title doesn't have a typo. I'm not asking about whether your client *owns* stocks and bonds, or whether they work in the stock or bond market. Rather, I'm wondering whether your client's job, career and employment income – also known broadly by the term *human capital* -- exhibit the financial characteristics of a stock portfolio or a bond portfolio. Because, if they are *stocks*, you should be encouraging them to lighten-up on the equity risk, and to hold more bonds in their financial portfolio, but if they are more like *bonds*, then you should be selling them more stock-like investments.

Let me explain. But first some background. According to Statistics Canada the average Canadian family unit whose head of household is 30 years old, has a median net worth of approximately $47,000. In other words, 50% of Canadian families in this category have a net worth greater than $47,000 and 50% have a net worth that is less than this number. As you might expect, the net worth figure is technically defined equal to the family's total assets minus the family's consolidated debts and is expressed in year 2000 dollars. In the same study it was noted that if the head of household was 40 years old, the median net worth of the family unit was $96,000 and for 50 year-olds the relevant figure was $165,000. There should be no surprise about the impact of age on median wealth.

However, while I certainly do not quibble with Statistics Canada's methodology in this and similar studies, I truly think that a traditional account's *assets minus liabilities* view of the human balance sheet greatly under-estimates the true economic net worth of the company I like to call *YOU Inc.*

Gray Matters

The ongoing movement of workers from professionally managed plans to personal savings vehicles requires them to make their own decisions about how to allocate retirement savings and what products they should use to generate income in retirement. This shift naturally creates a huge demand for investment advice from the financial-planning communities.

To assist financial advisors in providing theoretical foundation and practical solutions for developing investment advice to individual investors throughout their investing lifecycles—from the accumulation stage to retirement—our research project attempted to create a framework that:

1 Analyzes the asset-allocation decisions of individual investors while taking into consideration the following human capital characteristics: the size of human capital, its volatility, and its correlation with other assets.

2 Jointly analyzes the decision of how much life insurance a family should have to protect against the loss of its breadwinner and how the family should allocate its financial resources between risk-free and risky assets, vis-à-vis the dynamics of

Is Your Client a Stock or a Bond?

To build better portfolios, advisors need to measure a client's human capital. by **Peng Chen**

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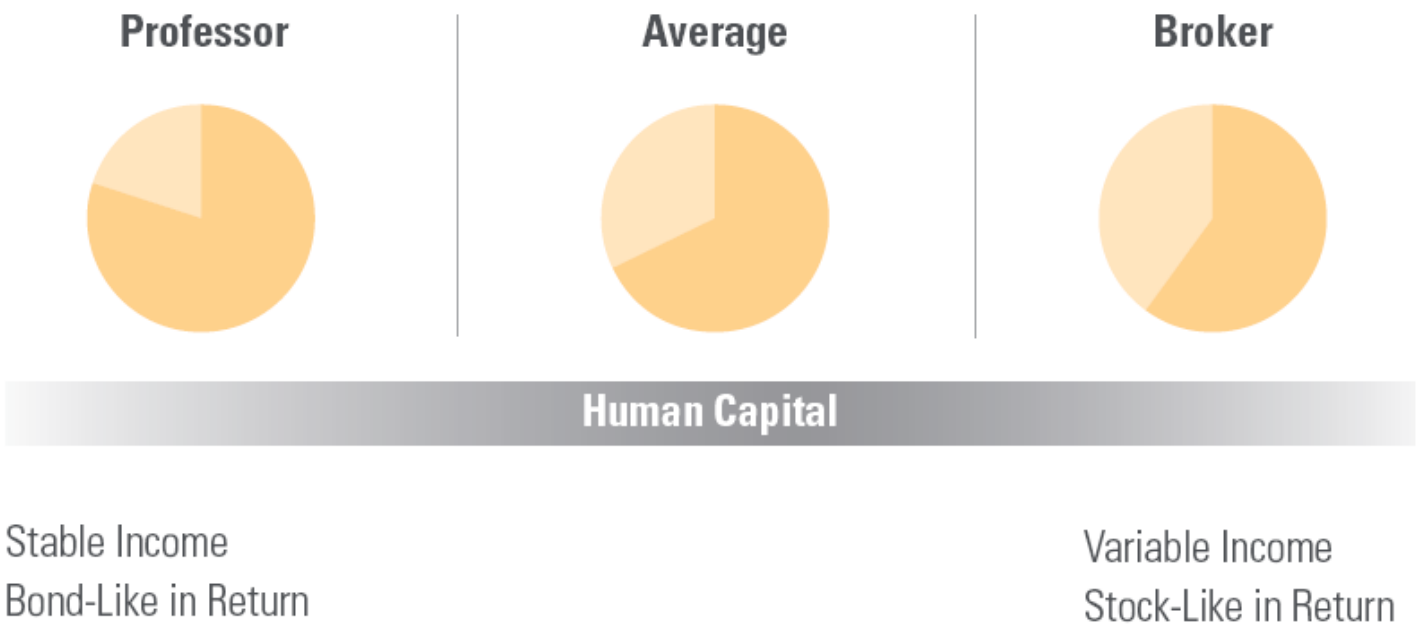
How the Volatility of Your Career Affects Your Human Capital



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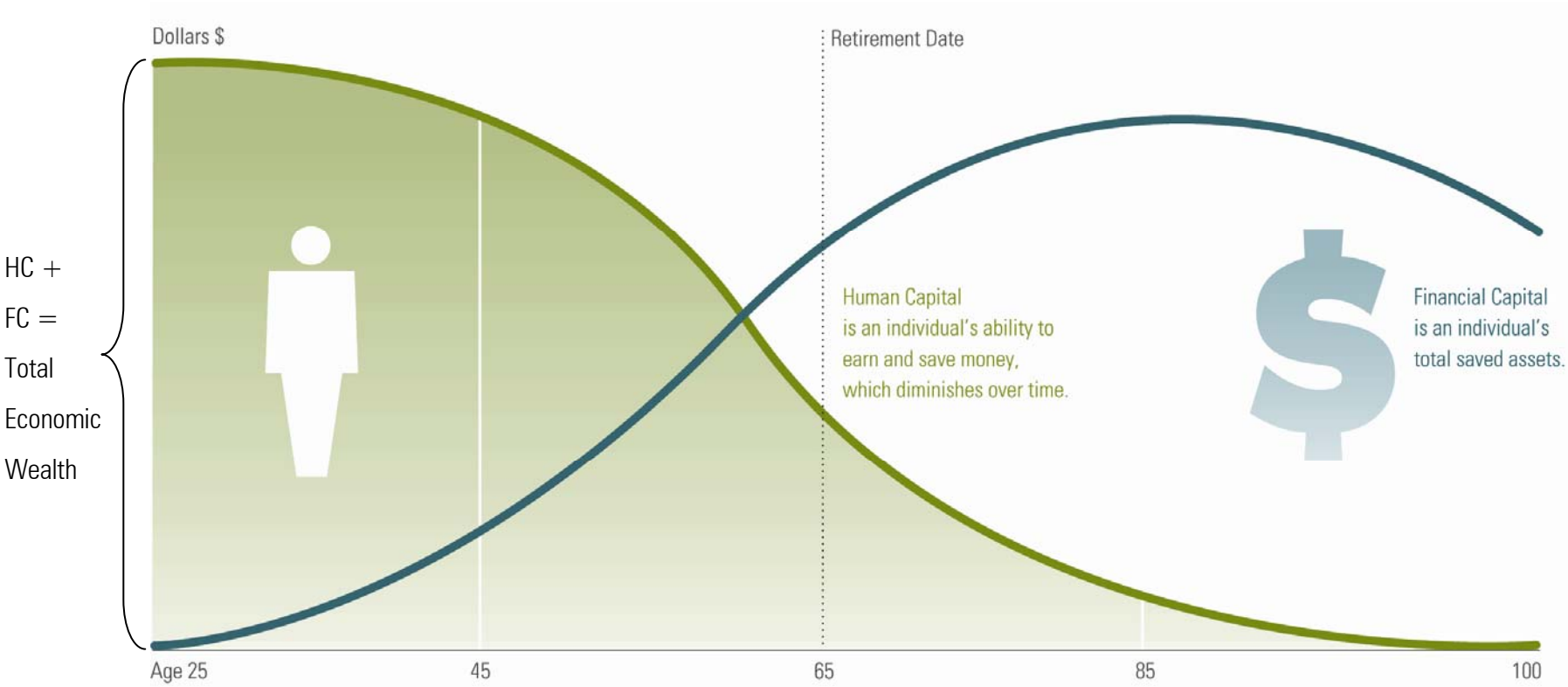
Typical Life Cycle of Human Capital and Financial Capital



Risks in Accumulation

- Expense Risk
- Savings Risk
- Mortality Risk
- Market Risk

Risks in Retirement

- Expense Risk
- Bequest Risk
- Longevity Risk
- Market Risk

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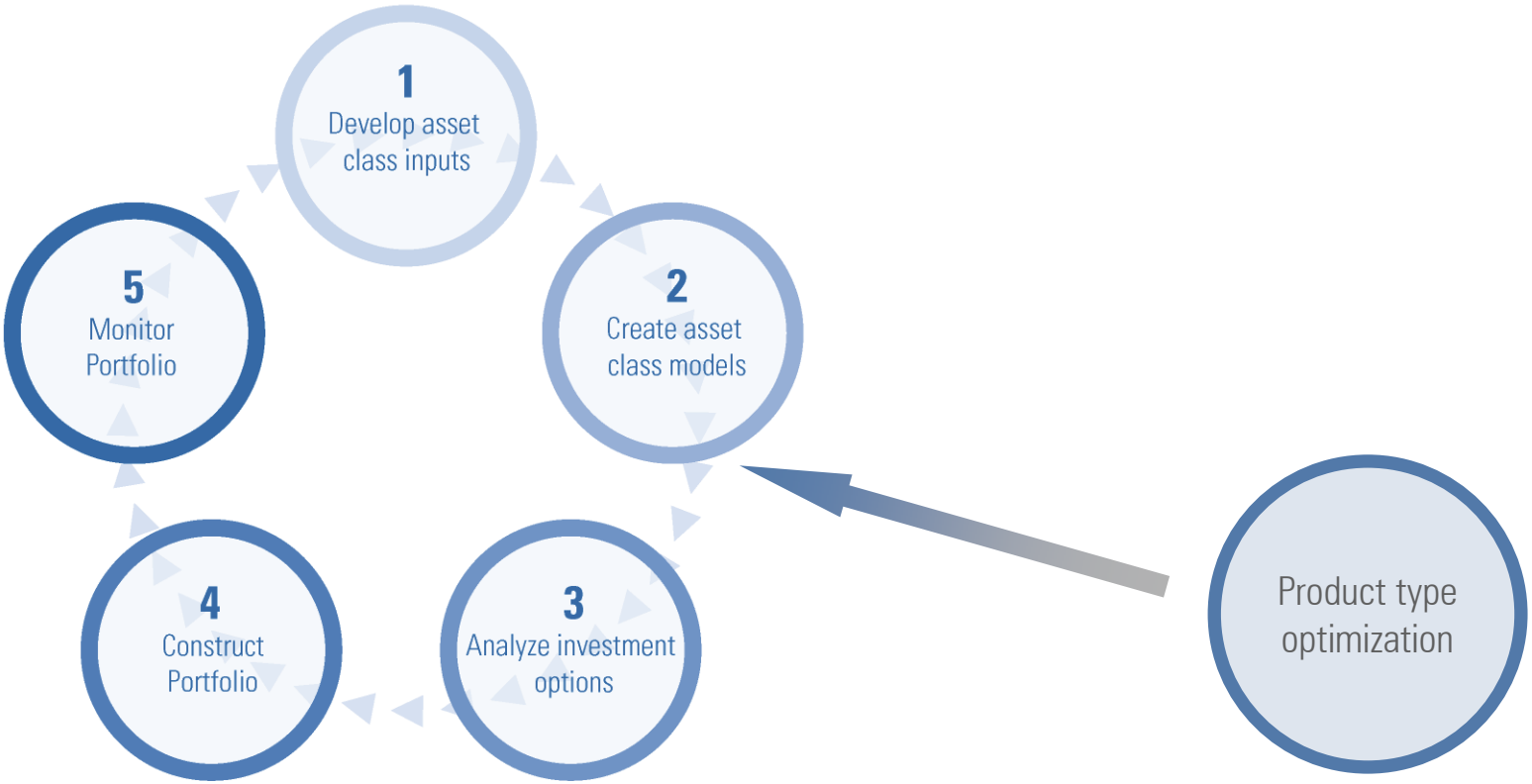
Individual Balance Sheet

Assets	Liabilities
Financial Capital	**Future Expenses**
Human Capital	PV of Pre-Retirement Expenses
PV of Earnings for Pre-Retirement Expenses	PV of Post-Retirement Expenses
PV of Earnings directed toward Savings	PV of Bequest
PV of future Social Security and Pensions	
Surplus (Deficit)	

PV = Present Value

Ibbotson's Investment Management Process

- Including Insurance Products can create a powerful solution



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Managing Mortality Risk

Asset Allocation & Life Insurance

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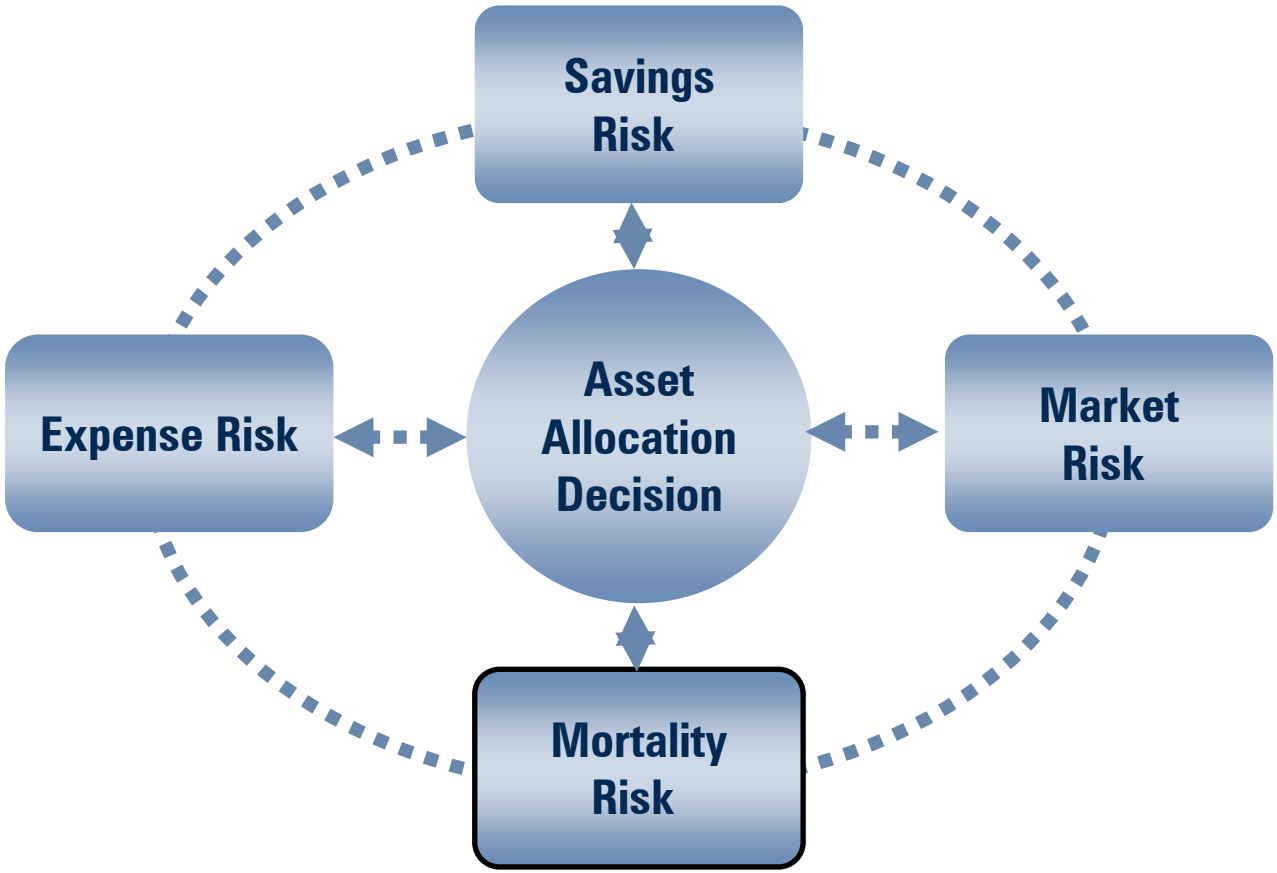
Lifetime Risks: Accumulation Phase



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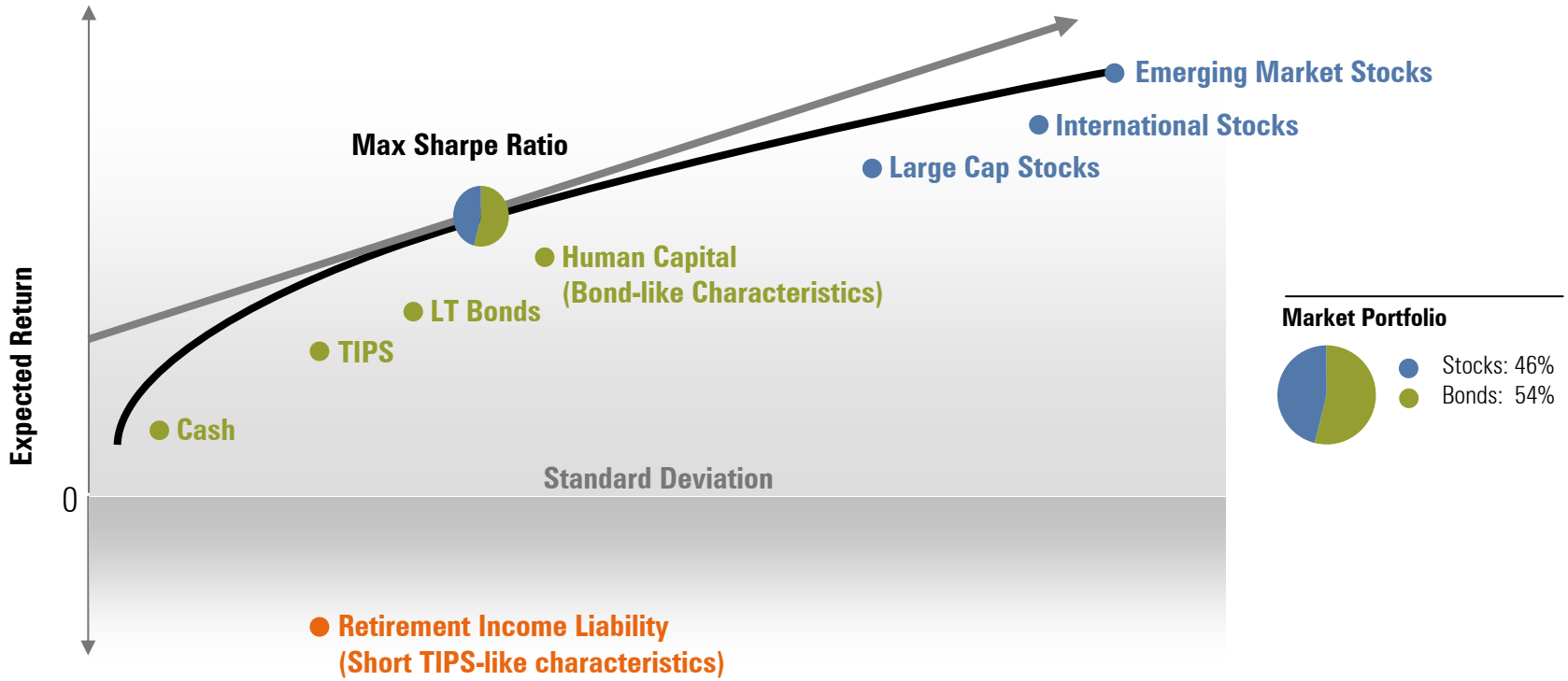
Modern Portfolio Theory: Markowitz's MVO and Sharpe's CAPM



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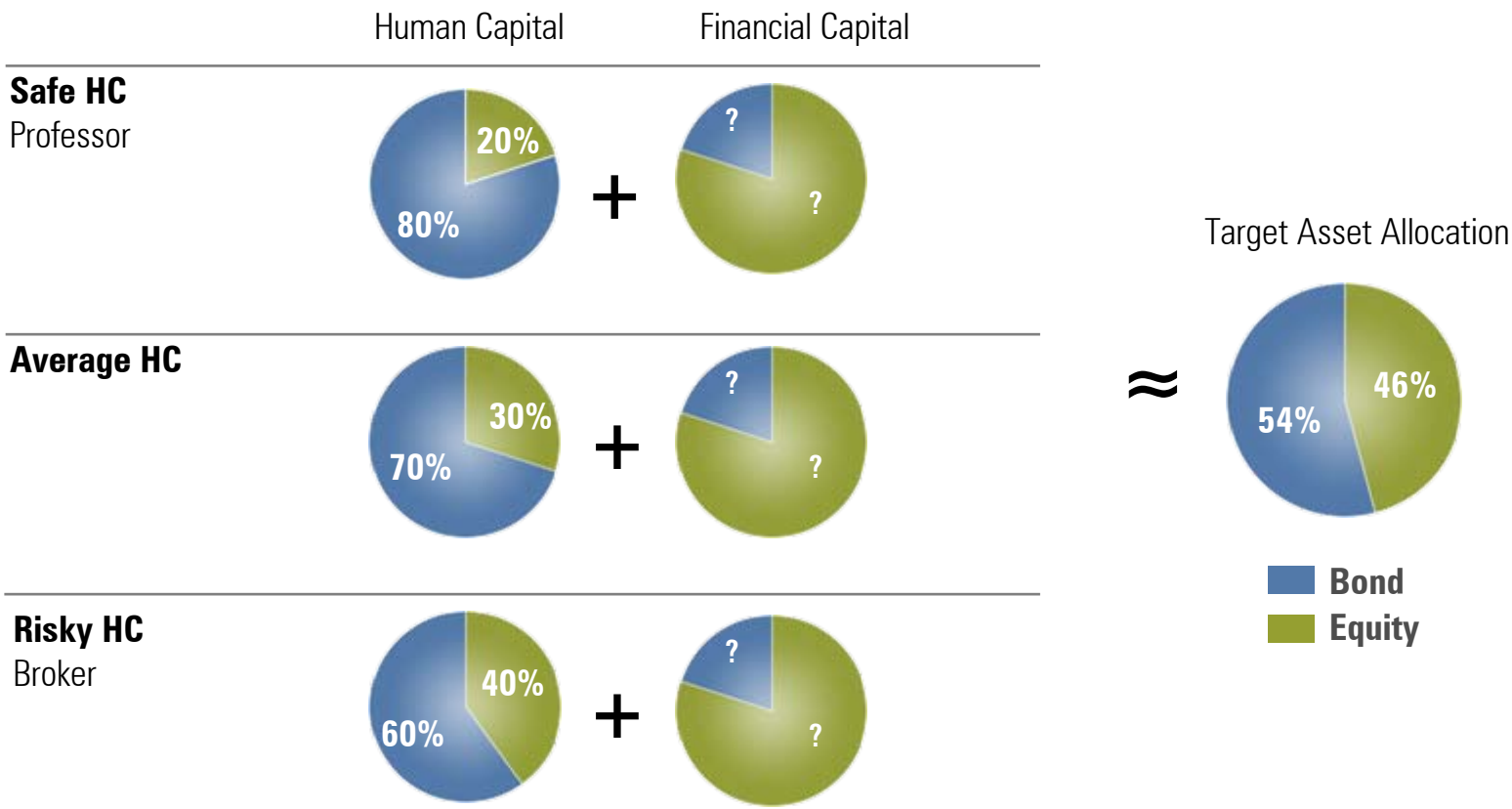
Human Capital Impacts Asset Allocation Decision



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Asset Allocation with Insurance Products

Inputs

Human Capital,

Financial Capital and Current Savings

Capital Market Assumptions

Questionnaire
Collect info such as: Age, income, bequest preference, dependents, life expectancy, risk tolerance

Outputs

Asset Allocation
Decide if need Mutual Funds, ETFs, Separate Accounts

Life Insurance Face Value
or
Annuity Product

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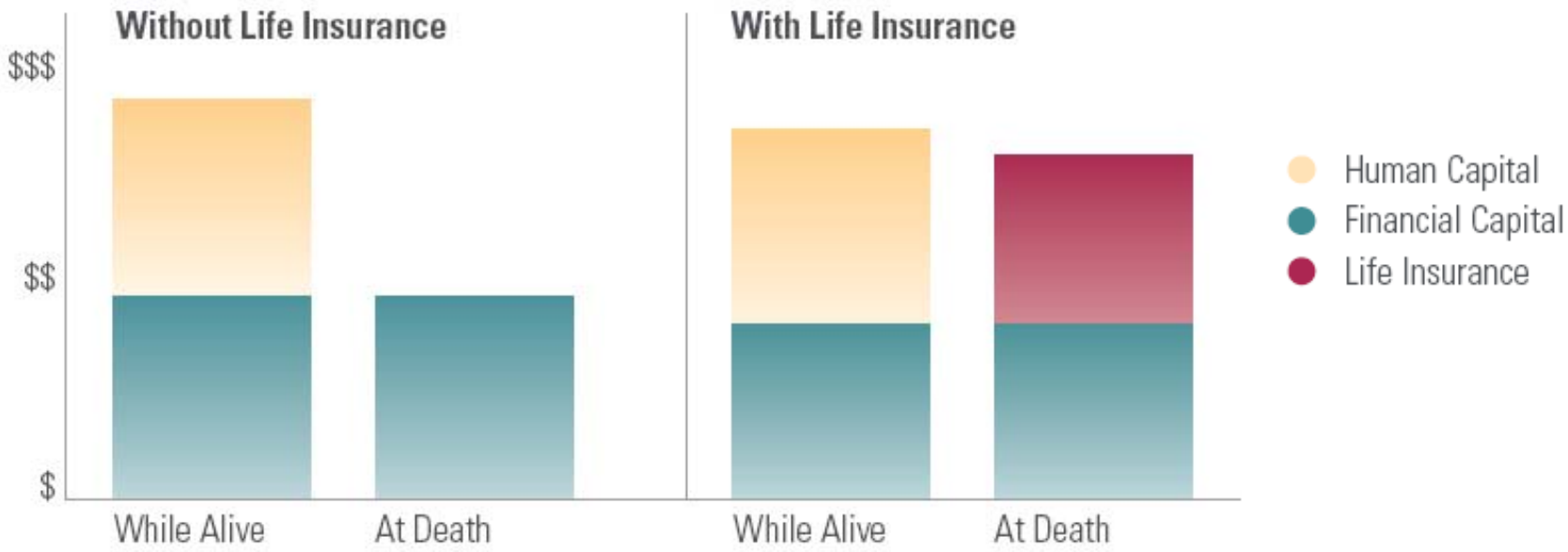
Total Economic Wealth



The Impact of Life Insurance

Combining your asset allocation strategy with life insurance protects your human capital while optimizing the mortality-risk adjusted economic value of your portfolio.

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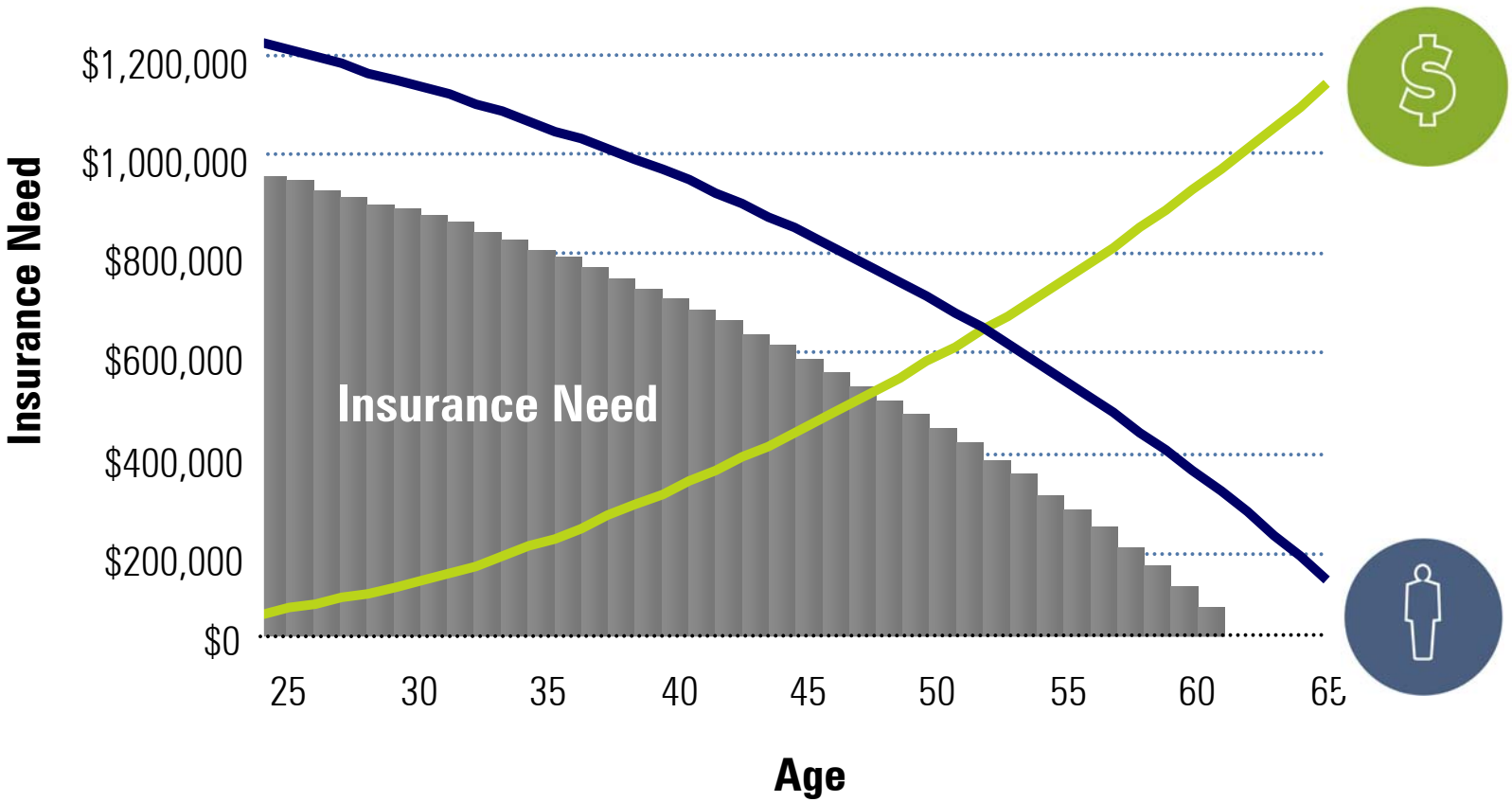
Life Cycle of Human Capital



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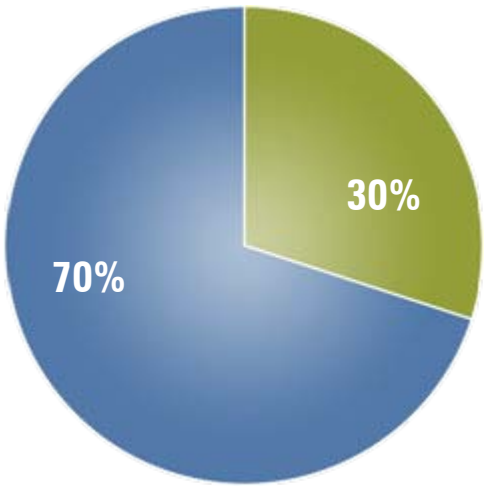
Total Economic Worth

Human Capital



Financial Capital

High Human Capital ➔ Higher insurance demand
High Human Capital ➔ Risky Asset Allocation

Bond
Equity

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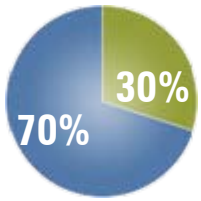
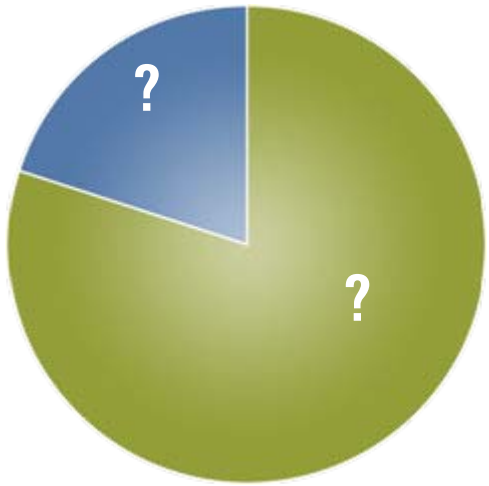
Total Economic Worth

Human Capital



Financial Capital



Low Human Capital ➔ Low insurance demand
Low Human Capital ➔ Conservative Asset Allocation

Bond
Equity

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Asset Allocation, Life Insurance, and Human Capital

Higher risk aversion	▸ More insurance ▸ Conservative asset allocation
Higher bequest motive	▸ More insurance ▸ Little or no impact on asset allocation
Higher current wealth	▸ Less Insurance ▸ Conservative asset allocation
Higher correlation (income vs. returns)	▸ Less insurance ▸ Conservative asset allocation
Older	▸ Less insurance ▸ Conservative asset allocation

Managing Longevity Risk

Asset Allocation & Annuities

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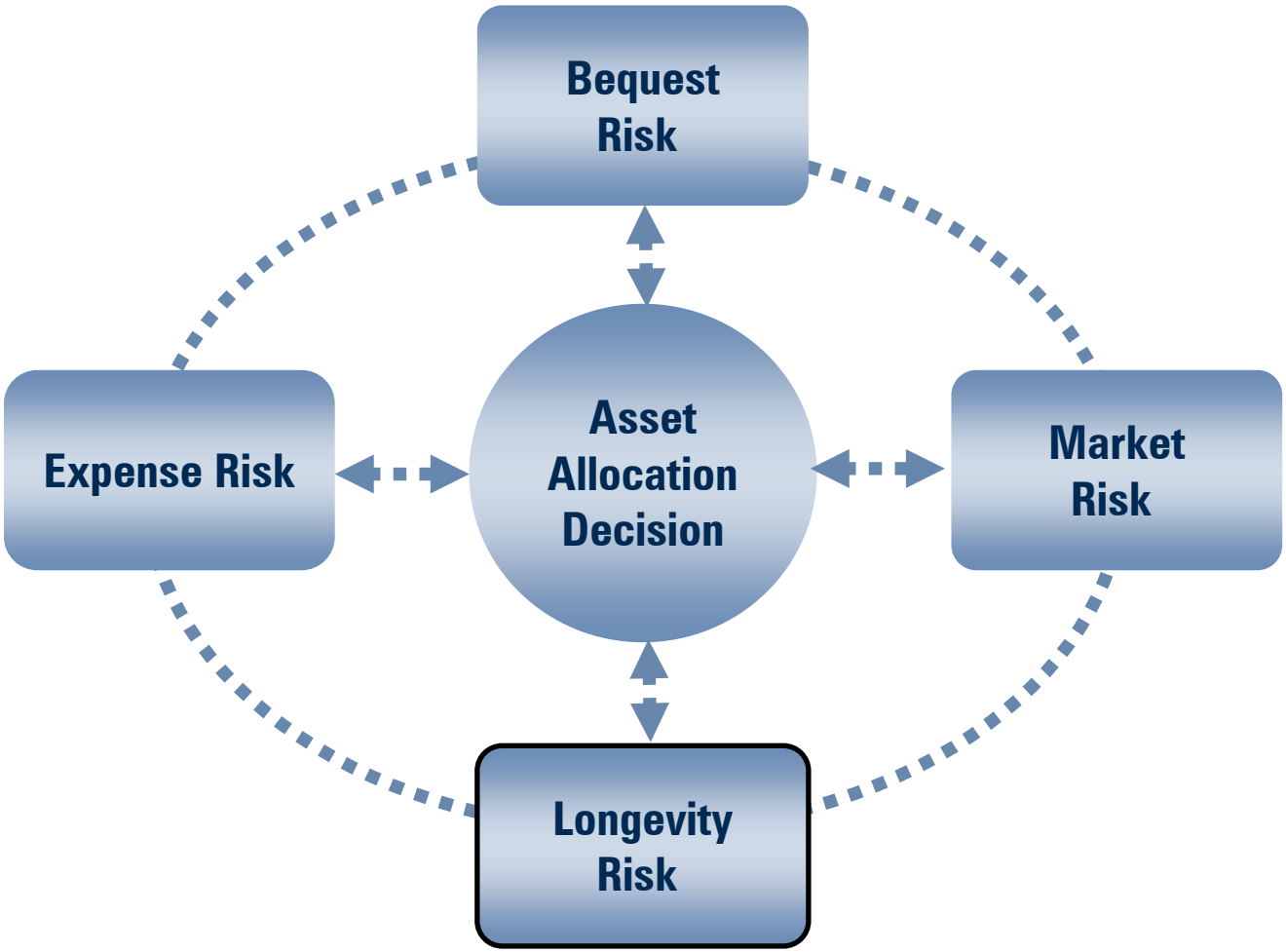
Lifetime Risks: Disbursement Phase



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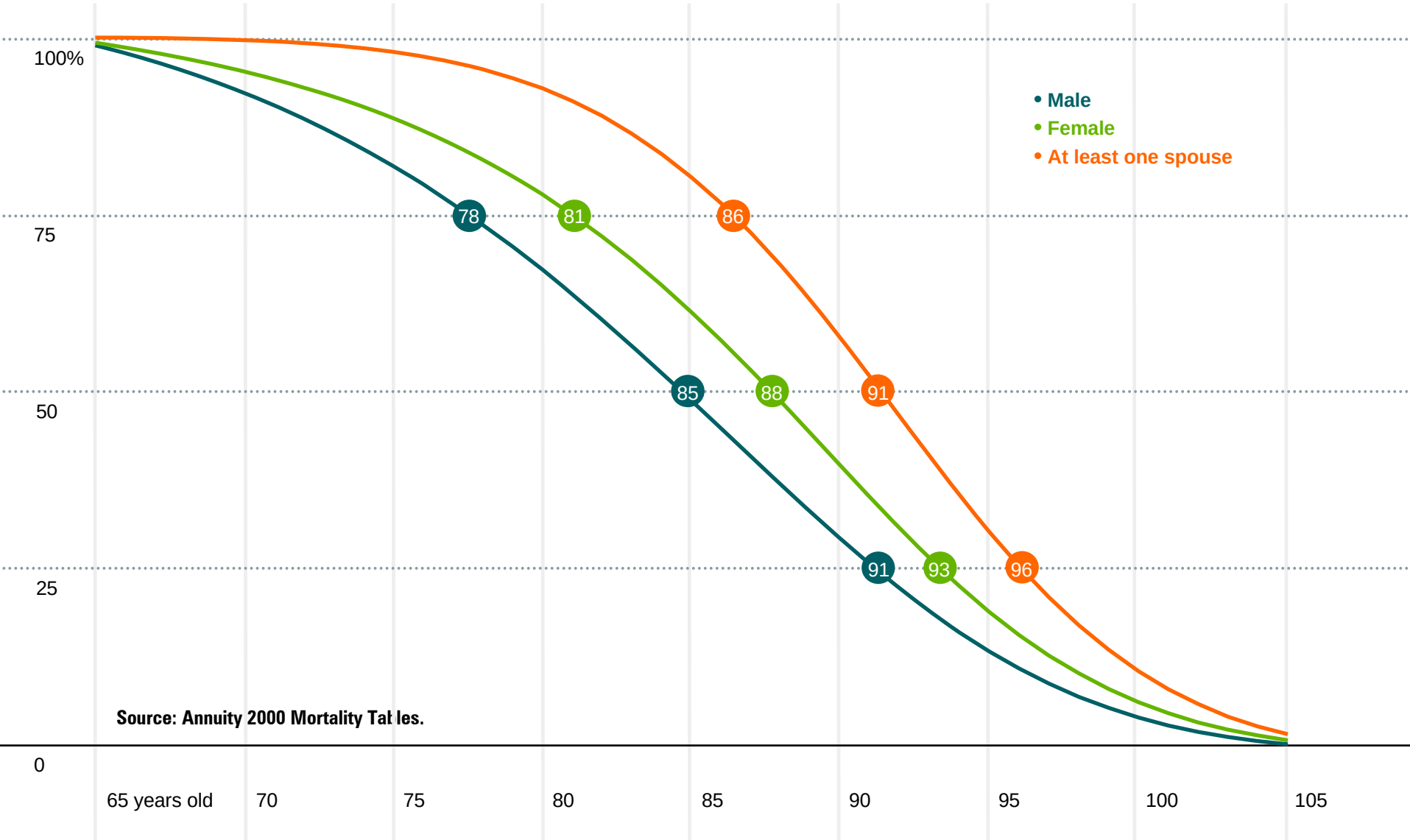
Retirees Should Plan for a Long Retirement

Probability of a 65-year-old living to various ages



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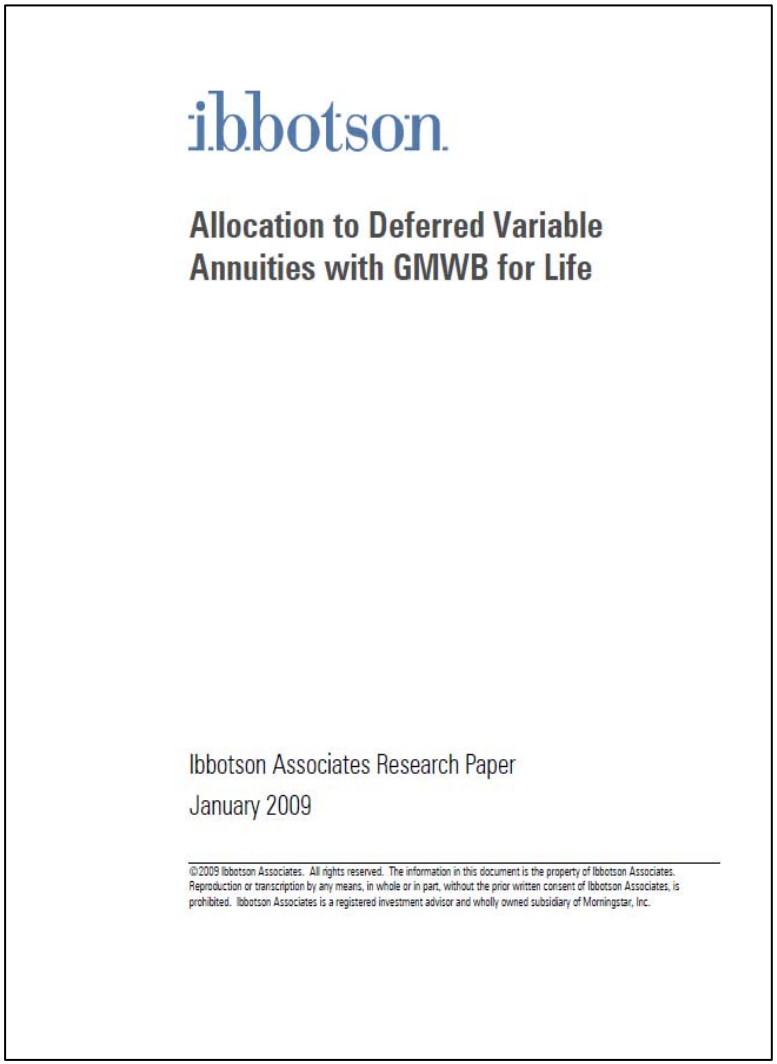
Thought Leadership in Traditional / Insurance Hybrids



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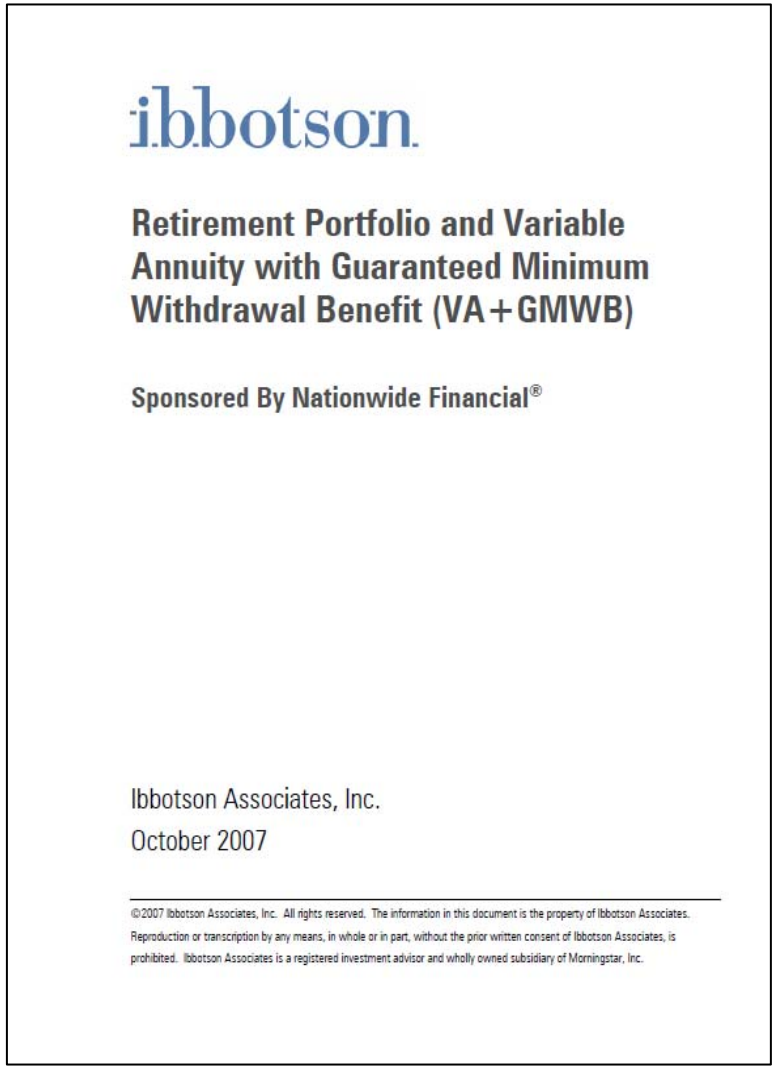
Allocation to Deferred Variable Annuities with GMWB for Life

Ibbotson Associates Research Paper

January 2009



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Retirement Portfolio and Variable Annuity with Guaranteed Minimum Withdrawal Benefit (VA+GMWB)

Sponsored By Nationwide Financial®

Ibbotson Associates, Inc.

October 2007

Asset Allocation with Insurance Products

Inputs

Human Capital,

Financial Capital and Current Savings

Capital Market Assumptions

Questionnaire
Collect info such as: Age, income, bequest preference, dependents, life expectancy, risk tolerance

Outputs

Asset Allocation
Decide if need Mutual Funds, ETFs, Separate Accounts

Life Insurance Face Value
or
Annuity Product

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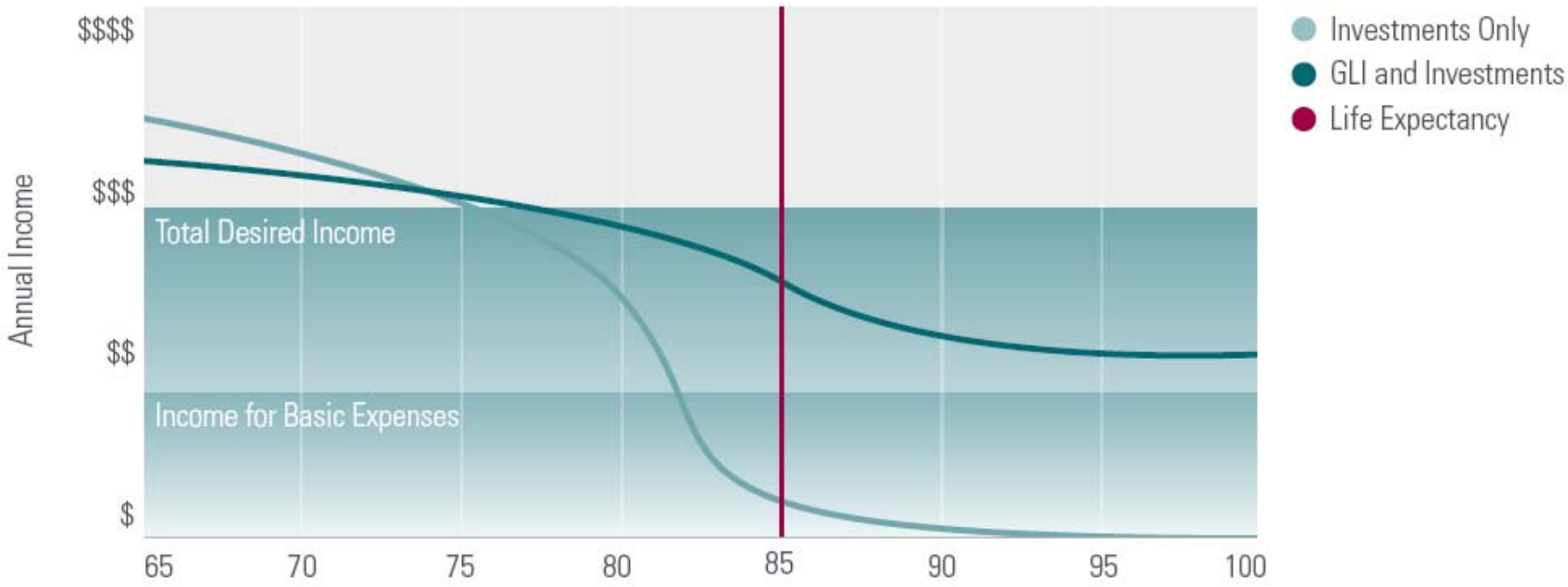
Impact of Guaranteed Lifetime Income Annuity*



*Graph does not include pension and social security

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Asset Allocation with Payout Annuity: Key Factors

Factor	Proportion to Implement with PA	Reason
Large Bequest*	Lower	Preference to leave more
High Income Sustainability*	Higher	Preference for personal consumption
High Subjective Survival Probability*	Higher	Perceived longevity risk / suitability
High Fees	Lower	Fees reduce returns
Large Wealth*	Varies	Ratio of wealth to income need
High Income*	Varies	Ratio of wealth to income need

* Factors that are typically solicited using a retirement income questionnaire.

Lifetime Advice Solution

- The investor experience is enhanced: More holistic, lifetime advice tailored to the individual needs of the client
- Innovative solution that addresses advisors need for retirement income solutions
- Hedges mortality risk (Life Insurance)
- Hedges longevity risk (Annuities)
- Unbiased, third party recommendation
- Integrated sales solution

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