Measured Matters

EBRI-ERF Policy Forum #75
Thursday, December 11, 2014

Wireless Password: innovation

ebri.org
Employee Benefit
Research Institute

Panel 1: Employment-Based Health Benefits and Big Data

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BIG DATA APPROACHES: BETTER CONNECTING PHYSICIANS AND PATIENTS

Mike Manocchia, PhD
Cigna Analytics
EBRI Forum

December 2014

Together, all the way.℠

Cigna®

Cigna is applying big data analytics across all aspects of our business

Commitment to analytics

Significant financial commitment
Interdisciplinary data scientists
Dedicated technology talent
Institutionalized “insight” process

Big data platform

Data diversity

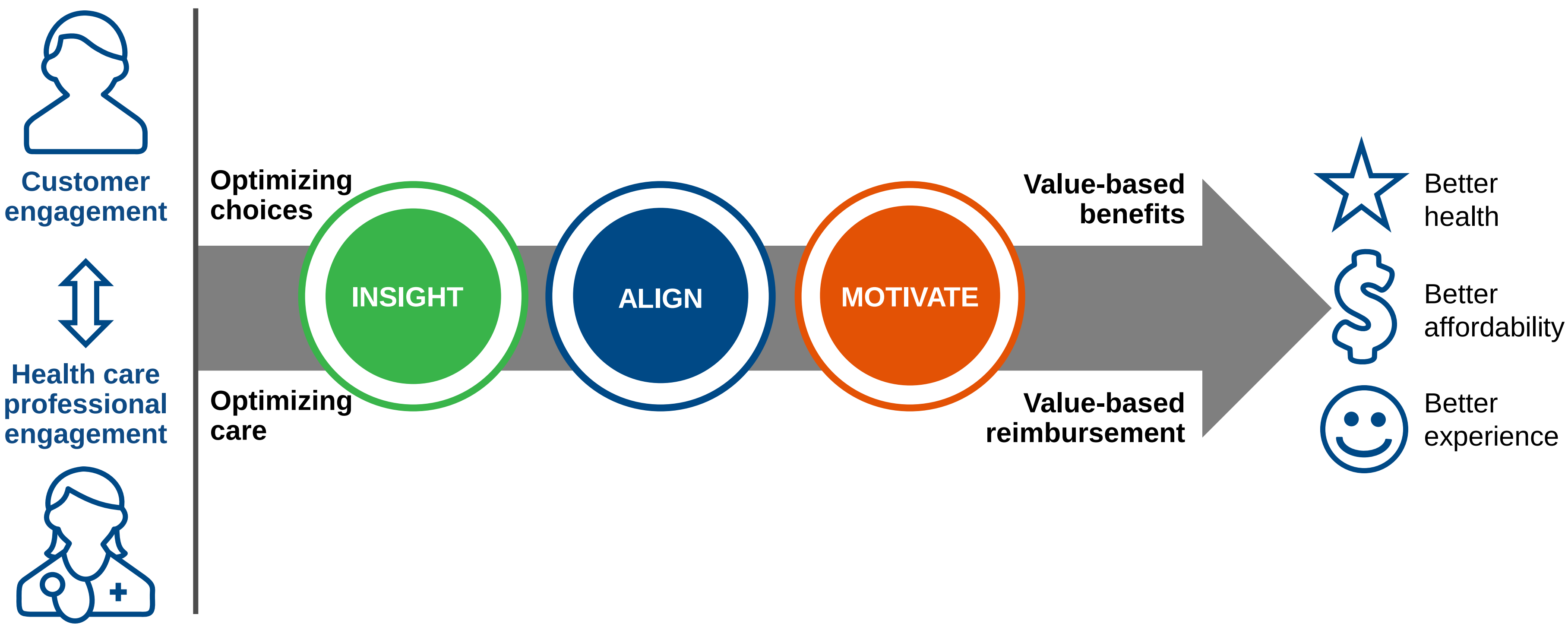
Unstructured text
Consumer data
Web logs
Health diagnostics

Key initiatives

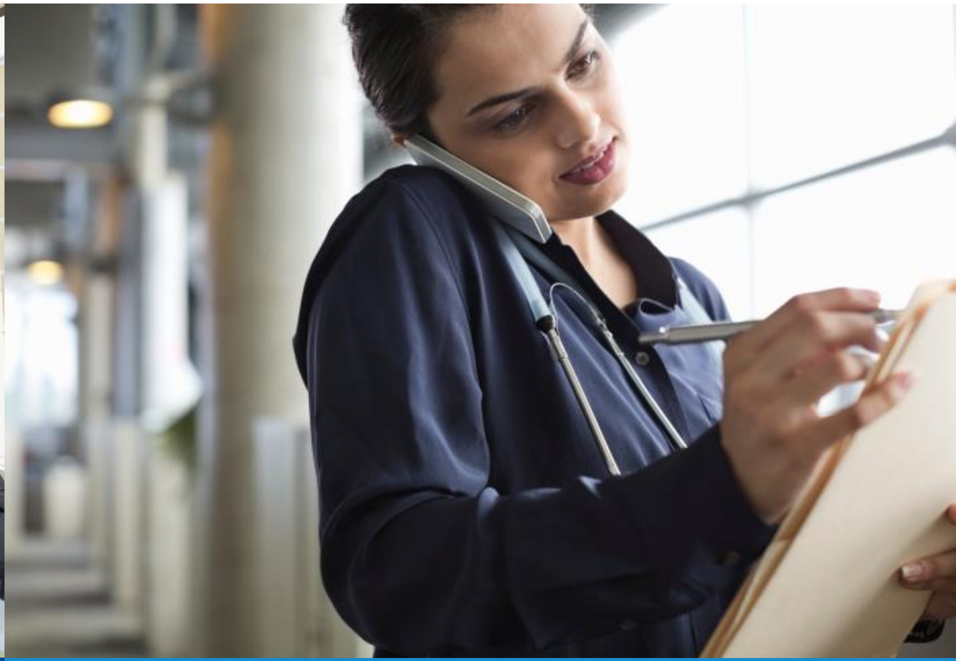
Health segmentation
Net promoter score
Delivery system collaborations
Employer benefit design

Cigna's connected care approach

Meet them where they are. Take them where they need to be.



Big data driven initiatives that are core to Cigna's connected care strategy



Identifying customer level health opportunities and individual tendencies to make changes based how, where and by whom information is delivered.

Deeper collaboration with physicians and hospitals by sharing actionable information and creating value-based incentives.

Cigna.

What is the Health Matters score?

Define

STEP 1: Each attribute is scored for each customer as illustrated below.

Value of coaching opportunity	×	Targeted impact	×	Probability of success	=	Tobacco attribute score =
Quit tobacco $1,623		100% tobacco free		20%		**325**

STEP 2: The score for each attribute is combined for a total SMART score for each customer as illustrated below.

Customer with diabetes, gaps in care, smoker and taking brand medication

ER/IP diabetes attribute score 100

Brand to generic attribute score 200

Tobacco attribute score 325

Gaps in care attribute score 350

Total SMART score 975

How Health Matters creates value for Cigna customers

Asthma	Diabetes	Coronary artery disease	Chronic kidney disease
• One ER visit or inpatient stay • Women's plus size purchases • Interest in dieting/weight loss	• Females > 42 • High-risk scores	• Females > 42 • High-risk scores	• Diagnosis of CKD Stage 4 • No evidence of dialysis

Medical cost savings opportunity

Asthma	Diabetes	Coronary artery disease	Chronic kidney disease
$500 PDMPY	$780 PDMPY	$900 PDMPY	$2.4k PDMPY

$500 - $2,400 (7%-23%) TMC Savings per engaged diseased customer

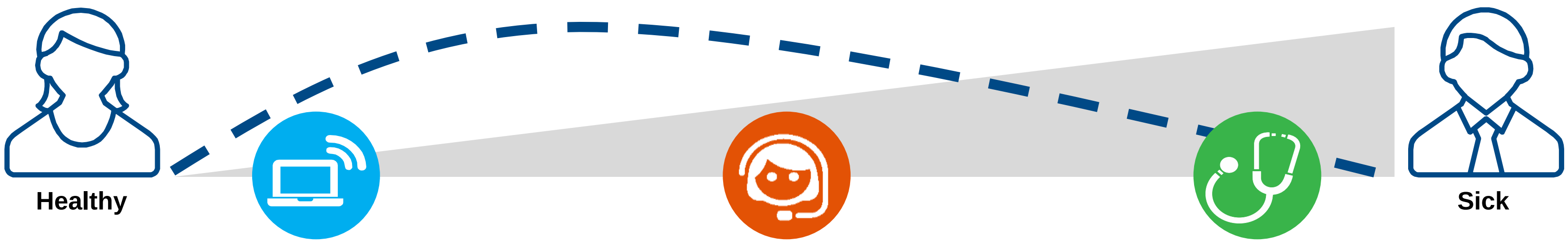
- Optimal segmentation yields superior medical cost savings for coaching
- 29%-42% of customers in national clients with these conditions are in optimal segments

1. Identify possible optimal segments (ex., within existing disease populations)
2. Look at new modalities for segments (ex., online, text, email)
3. Test, learn and implement what worked

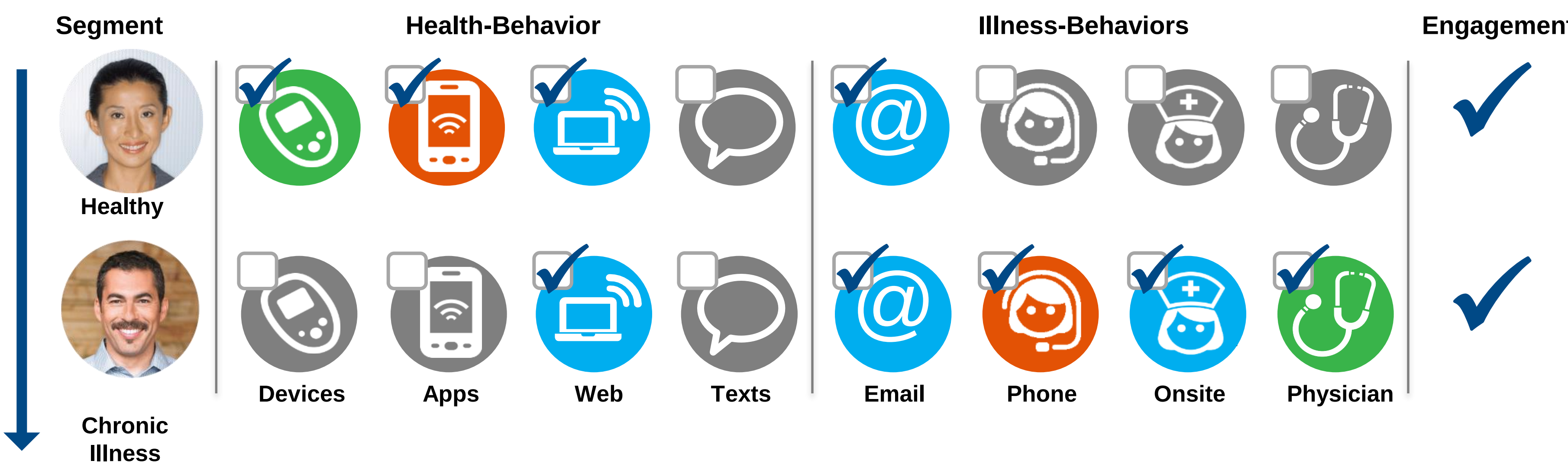
Cigna

Driving insights to personalize our operations and drive deeper customer engagement

Past = At least one discussion with a Cigna health coach (via phone) or Cigna online coaching tool

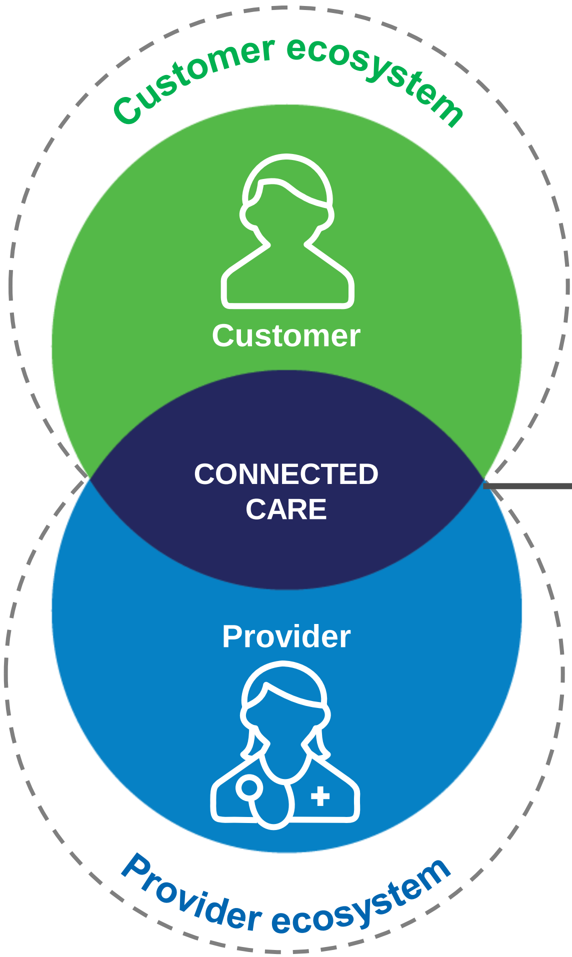


2015 and beyond = Measuring a customer's individual journey using his/her preferred health modality and accompanying evidence of change



How we connect customers with doctors

Piloting the Health Matters score and broader definition of engagement within key ACO groups



Key areas of focus

- Exchanging **actionable information**
- **Aligning** health goals and motivating change
- **Activating** and **empowering customers**
- Enhancing **value relationships** with **providers**

Cigna

How we see our Big Data initiatives evolving our collaborations with physicians

Today	Working Toward
Care management reports for embedded nurses to identify high-risk customers and close claim-based care gaps	New products and financial models to align incentives HCP, customer and client
Performance management reports for practice administrators to identify areas of opportunity for affordability and quality improvement	Risk-adjusted episode of care arrangements
Contract negotiations for ACO performance for quality and cost outcomes and taking action on proactive Cigna data	EMR data driving improved stratification and quality assessment
	Shared care plans between customer, Cigna nurses, and HCPs

QUESTIONS?

Offered by: Connecticut General Life Insurance Company or Cigna Health and Life Insurance Company.

Aetna's Big Data Journey

Personalization

Alex Baldenko, PhD
Data Scientist

Big Data Opportunities

Siloed Data Sources

Latent Information

Holistic Member View

Care Management

Unstructured Data

Call Logs

PDFs, Text

Member Satisfaction

Big Data Difficulties

Variety

Siloed Sources

Call Logs, PDF, text

Volume

Joining Several Sources

Text Logs, Web Clicks

Velocity

Web Activity

Claims Process

Veracity

Quality of Sources

Legacy ETL

Our Strategy

Machine Learning

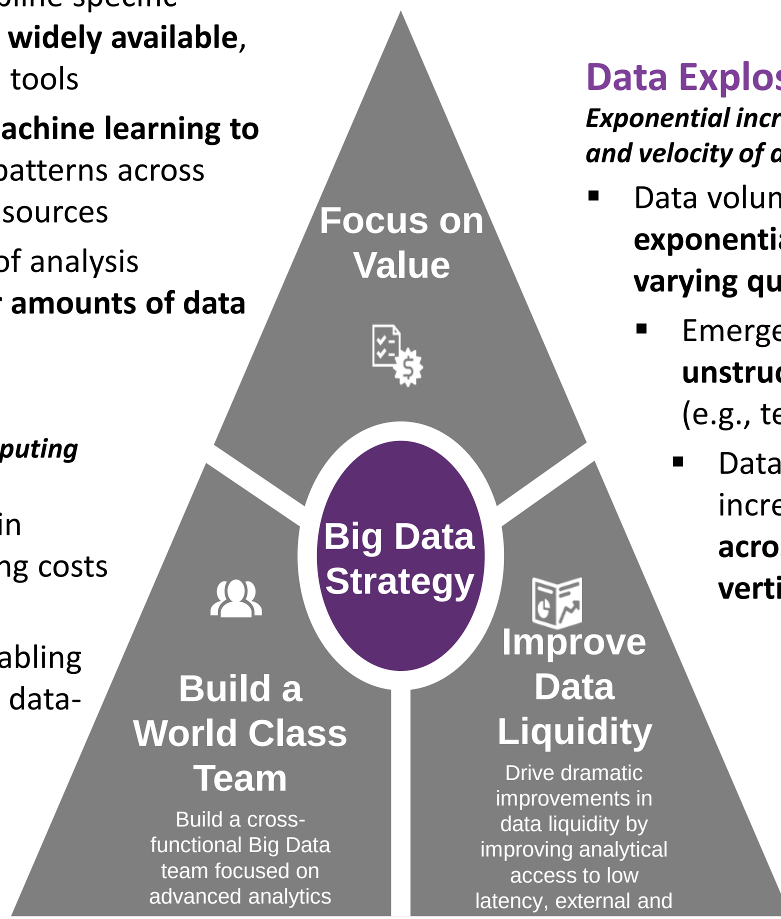
Democratization of arcane knowledge

- Formerly exotic discipline specific techniques are **more widely available**, often as open source tools
- **Rapid advances in machine learning to** identify and predict patterns across large, disparate data sources
- Depth and accuracy of analysis improved with **larger amounts of data**

Technology

Change in technology & computing paradigm

- **Relentless decrease** in storage and processing costs
- **Massively parallel processing** (MPP) enabling faster, more granular data-intensive analysis Commodity hardware and open source software **reducing barriers to entry**

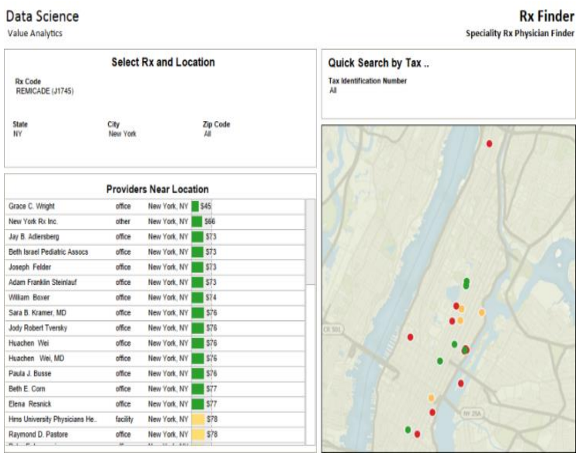


Data Explosion

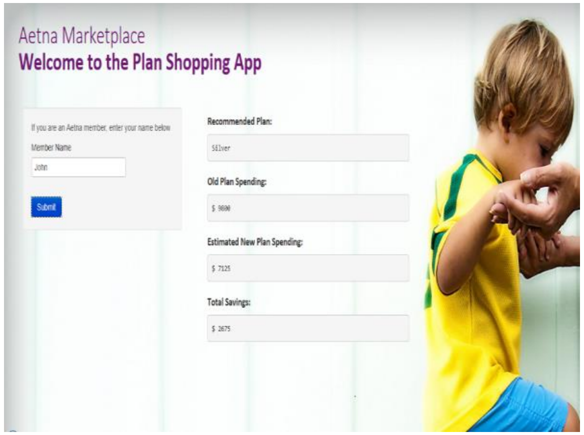
Exponential increase in volume, variety and velocity of available data

- Data volume **growing exponentially**, but with **varying quality**
  - Emergence of **unstructured data** sources (e.g., text, video)
    - Data becoming increasingly **liquid across industries and verticals**

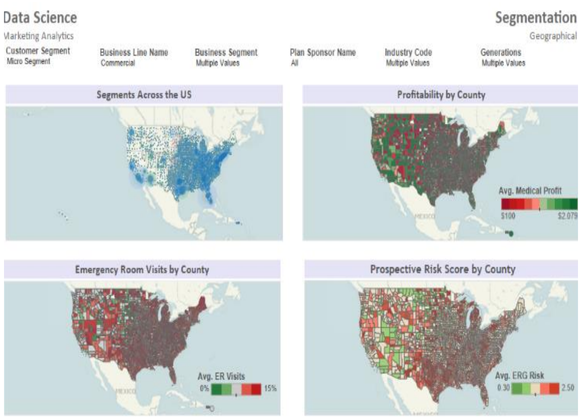
Personalization



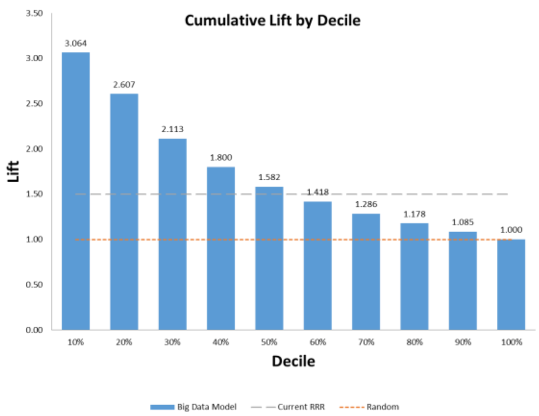
Rx Finder



Plan Recommender



Segmentation



Readmission Prediction

Transforming Employee Health: Prevention, Intervention & Engagement

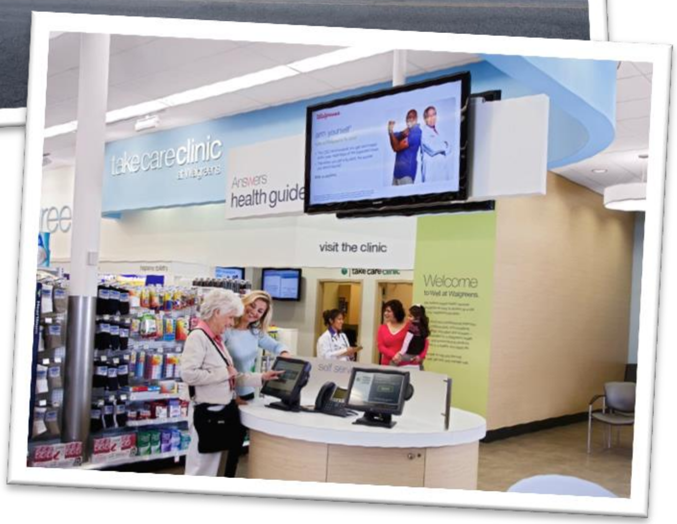
Mark Englizian, Group Vice President, HR Business Strategy & Solutions

December 2014

Walgreens

AT THE CORNER OF HAPPY & HEALTHY™

About Walgreen Co.
“At the Corner of Happy and Healthy”



- 8,295 best corners in US
- 2 strategic global partners
- $100Bn + combined revenue
- 400 healthcare clinics
- 63% US live w/in 3 miles
- 6.5 million customers per day
- 250,000 employees
- 210,000 members
- 75,000 in healthcare roles… *helping people Get, Stay, and Live Well*

Health Care at Walgreen Co.

10% of the members attributed to 65% of the healthcare spend

	PREVENTION	INTERVENTION	
Walgreens Experience	Low Risk	Moderate/Chronic Risk	High Risk
% Plan Members	73%	19%	8%
Claims Cost	$214.9m	$186.3m	$335.7m
Per Capita Cost	$1,431	$4,698	$21,432
% of Total Cost	29%	25%	46%

True cost savings result from continually moving associates "one box to the left"

Our Guiding Principles in Moving to An Exchange

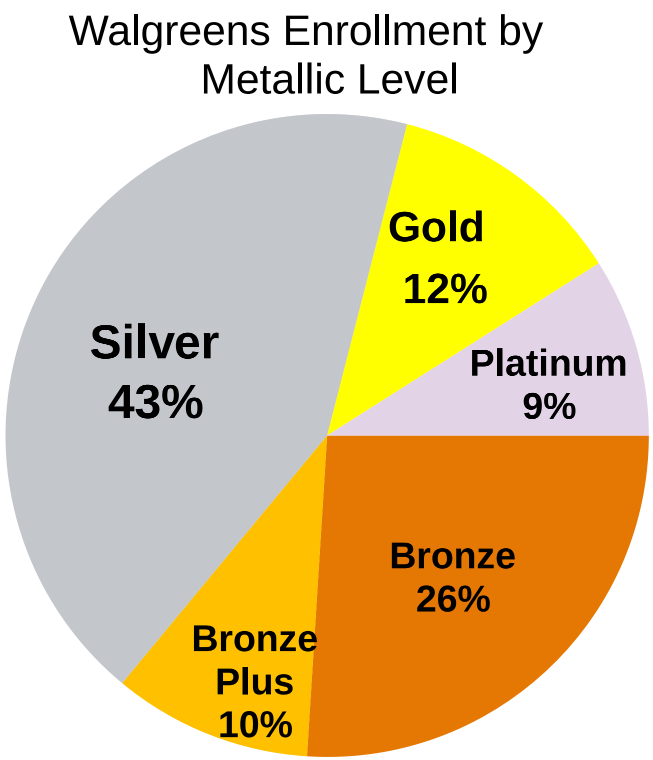
- Personalization of Benefits and Health Needs
- More Benefit Options
- Affordable Choices
- Wellness and Good Health Really Matters
- World-Class Enrollment/Engagement Tools

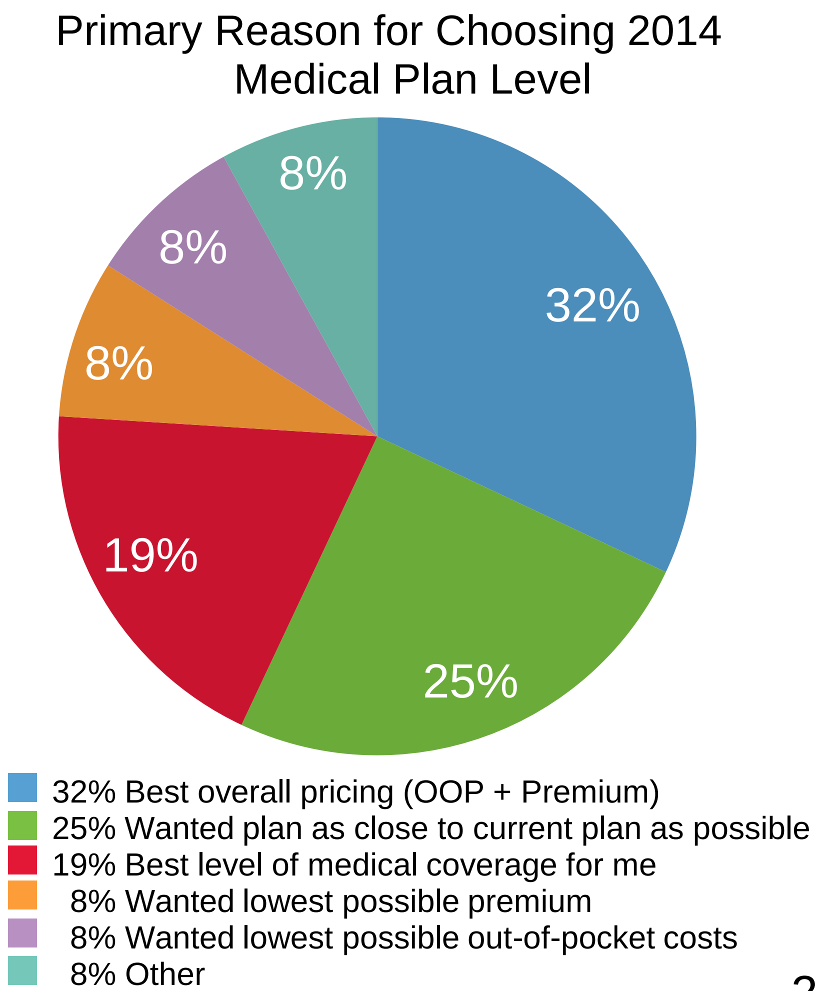
Live Well Benefits Store

Walgreens Family of Companies

Healthcare Exchange Enrollment Results

Record enrollment - over 140K completed, 98% online





Walgreens Zero Co-pay Program Today

- Team members and spouses are eligible for zero copay when participating with Health Coach
  - $0 co-pay for generic diabetes, cholesterol, blood pressure medications (new for 2014)
  - $0 insulin (up to a $50 copay)
  - $0 Walgreens branded diabetes test strips and syringes
- Results include adherence improvement of 10 points…

40 days of additional therapy

$53 savings per enrolled

Health coaching up 34% versus last year

Zero copy up 48% versus last year

2013 Healthcare Clinic Population Overview – Leveraging Store/Onsite Clinics to Lower Costs

Employees in a 10-mile radius of a Healthcare Clinic	Number of employees who are enrolled	Percentage of employees who are enrolled
98,757	42,436	43.0%

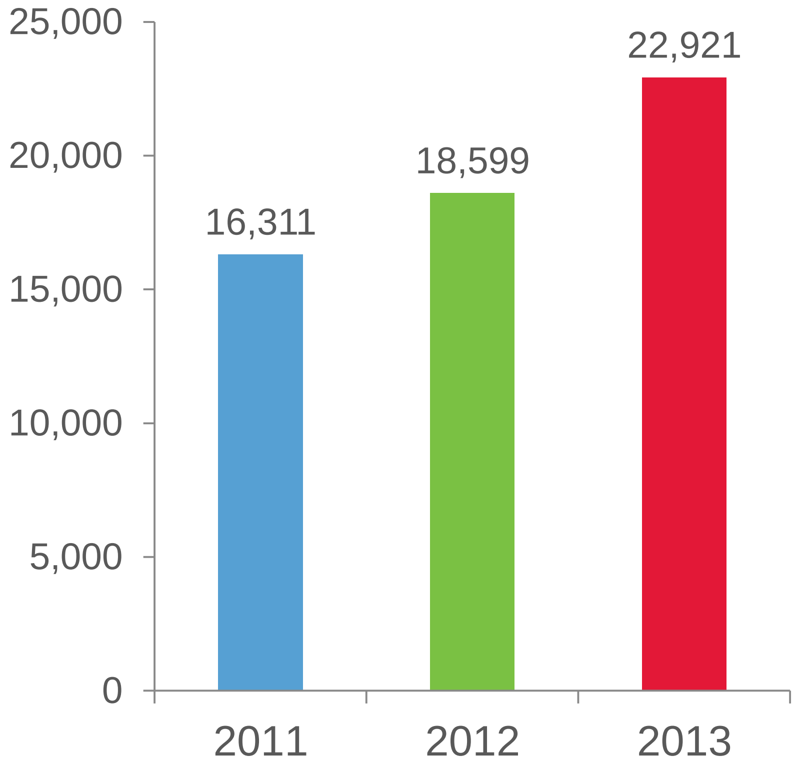
Relationship	Enrolled members	Clinic utilization (n)	Clinic utilization (%)
Employee	42,436	14,278	33.6%
Dependent	37,797	8,643	22.9%
Total	80,233	22,921	28.6%

Average population density for zip codes within 10 miles of a Healthcare Clinic
8,121 people per square mile

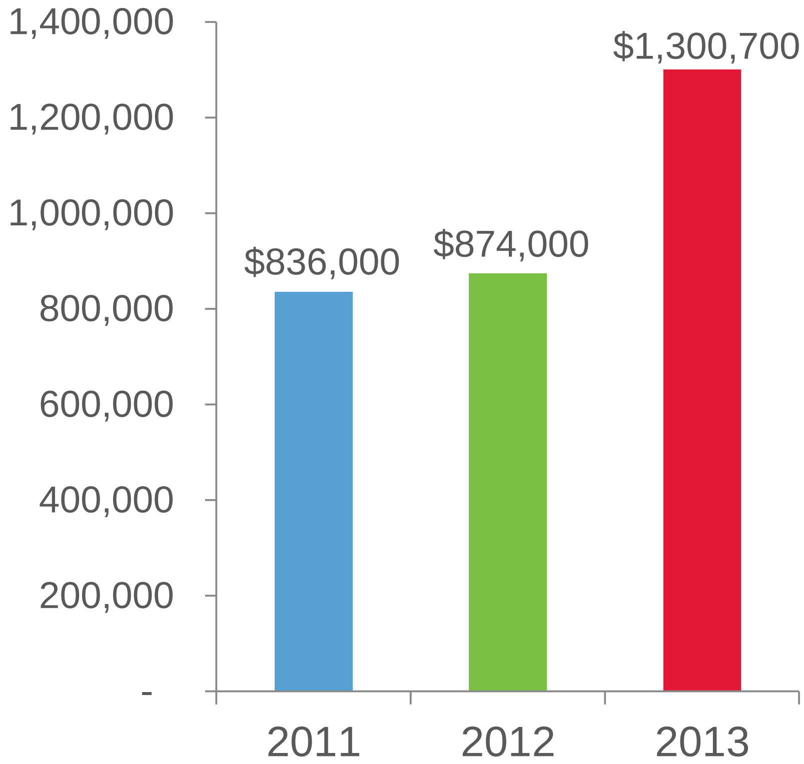
•Time period : 12/01/12 – 11/30/13

$5 Co-pay at Healthcare Clinic: Walgreens Team Members Saved Over $3 million in Healthcare Costs

Number of Healthcare Clinic visits by team members increased 40%



$3 million in savings over three years for the top 15 diagnoses



•Independent analysis conducted by HCMS group on behalf of Walgreen Co.

Balance® Rewards Employee Incentive Offering

Team members enrolled in the medical plan have the opportunity to complete Healthy Activities across three periods throughout the year

- Earn up to 120,000 Balance Rewards
  - 40,000 points per Period ($50 value)
  - Each activity worth 10,000 points
- Approximately 10 Healthy Activities are promoted each Period
- Examples of Healthy Activities include:
  - Did you get your Flu Shot?
  - Annual Preventative Screening
  - Participate in a Health Coaching program

Walgreens Team Member Engagement Increases Using Balance® Rewards

- ✓ Changed the incentive offering from gift card to loyalty points
- ✓ Significant increases in participant engagement

Engagement	***2013*** **($150 Gift card)**	***2014*** **($150 in Balance Rewards)**	Increase
Period 1 (January 1-March 31)			
• # of participants	18,190	30,556	68%
• Total dollars earned	$717,750	$1,500,000	
Period 2 (April 1-June 30)			
• # of participants	6,214	36,145	480%
• Total dollars earned	$260,850	$1,800,000	

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Panel 2: Measures for Assessing Retirement Income Adequacy

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PIMCO

Your Global Investment Authority

EBRI – ERF Policy Forum

Are traditional measures of success for retirement plan programs adequate for either the employer or the employee?

December 2014

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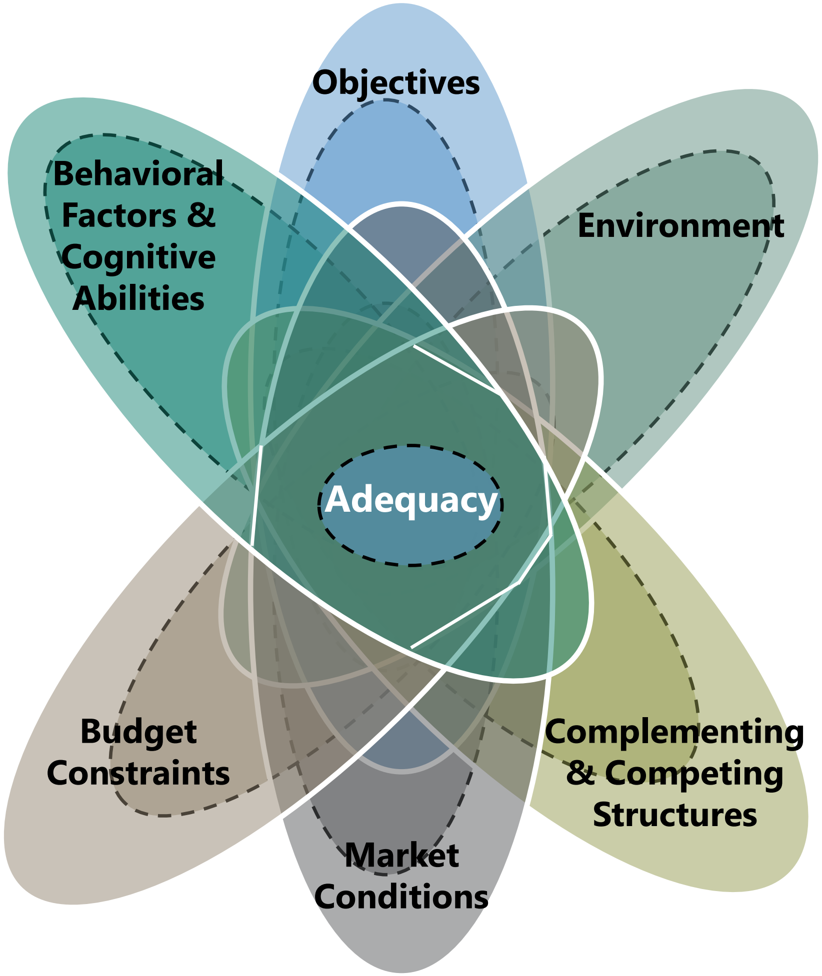
Adequacy is the desired intersection of a host of ever-changing factors and constraints



Pressure points affecting stability

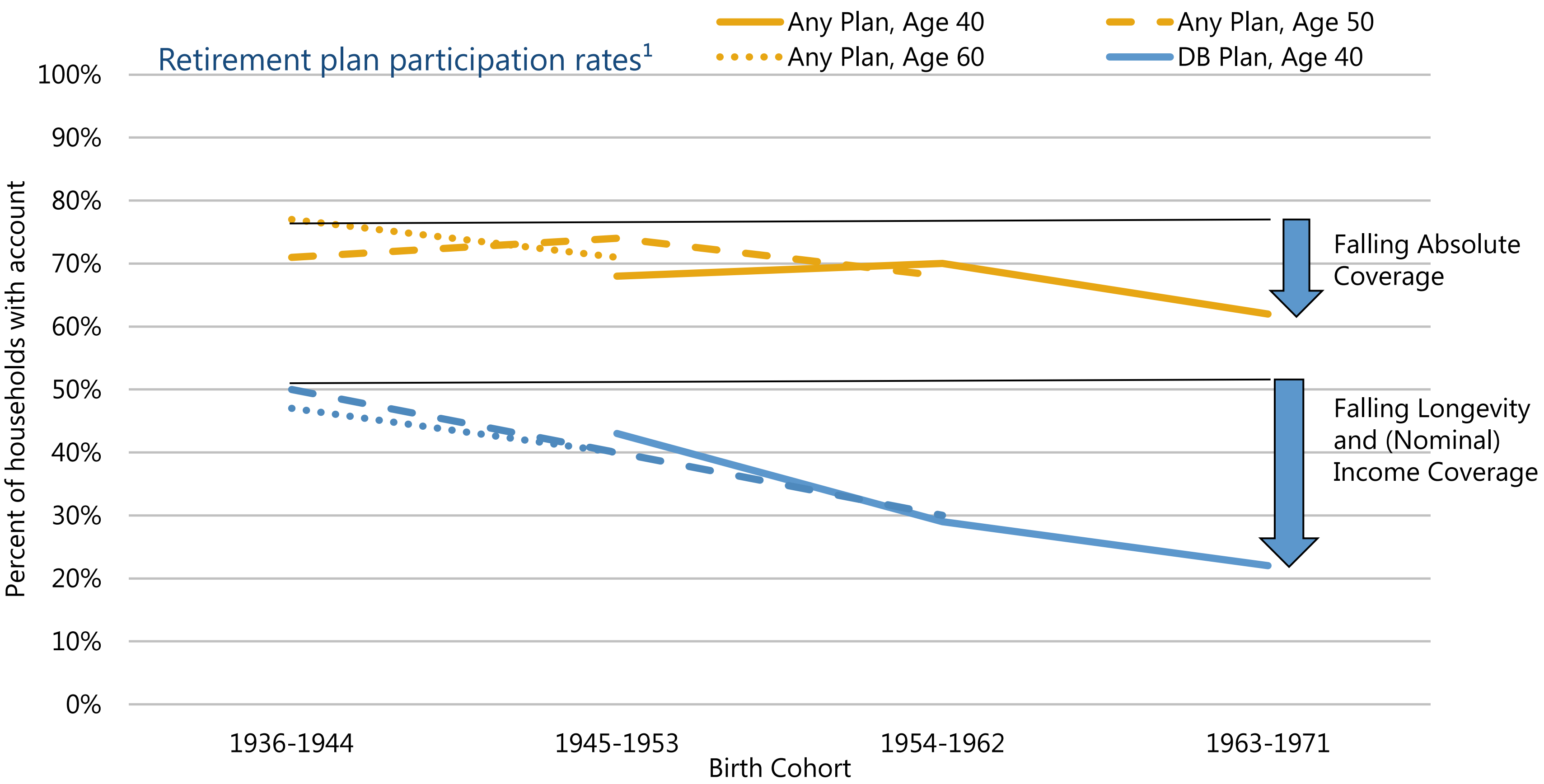
- Longevity
- Risk transfer in plan design
- Changing role of benefits in labor contracting
- Ex-ante vs. ex-post legal risk
- Viability of future market return assumptions
- Ability of individuals to merge own assets and draw down

Traditional Employer Objectives

"We define success as building and preserving purchasing power to meet retirement income needs for the majority of the people regardless of the economic environment"

Sample for illustrative purposes only
The income replacement target illustrates an example of the percent of their income that most plan participants will need to replace at retirement.

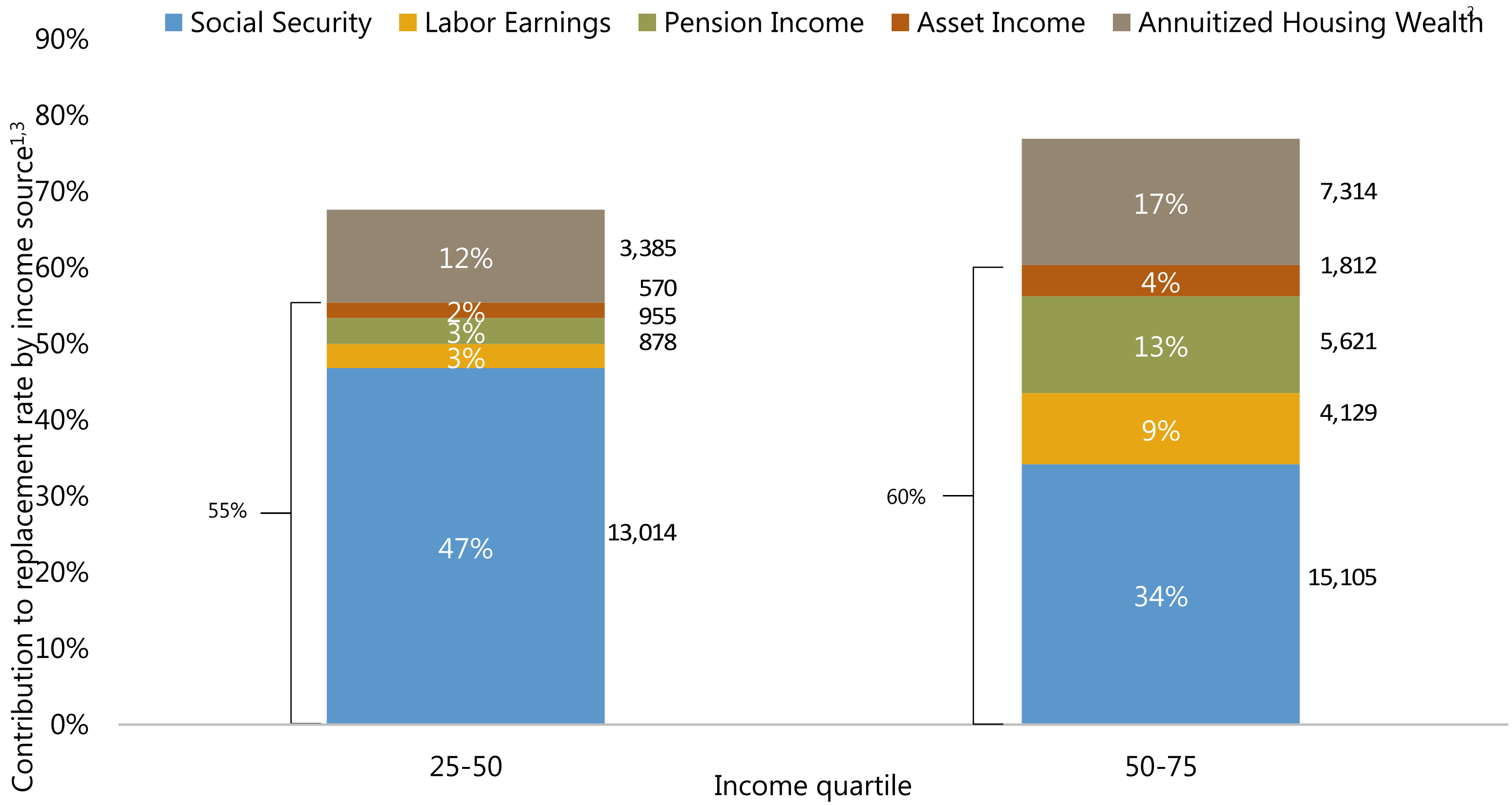
Falling benefit coverage



SOURCE: PIMCO, Poterba (2014), Survey of Consumer Finances (2010)

1 "Any Plan" represents households that report owning a DB Plan, a DC Plan, or and Individual Retirement Account

Income sources at retirement:
The stool's legs are of vastly different length



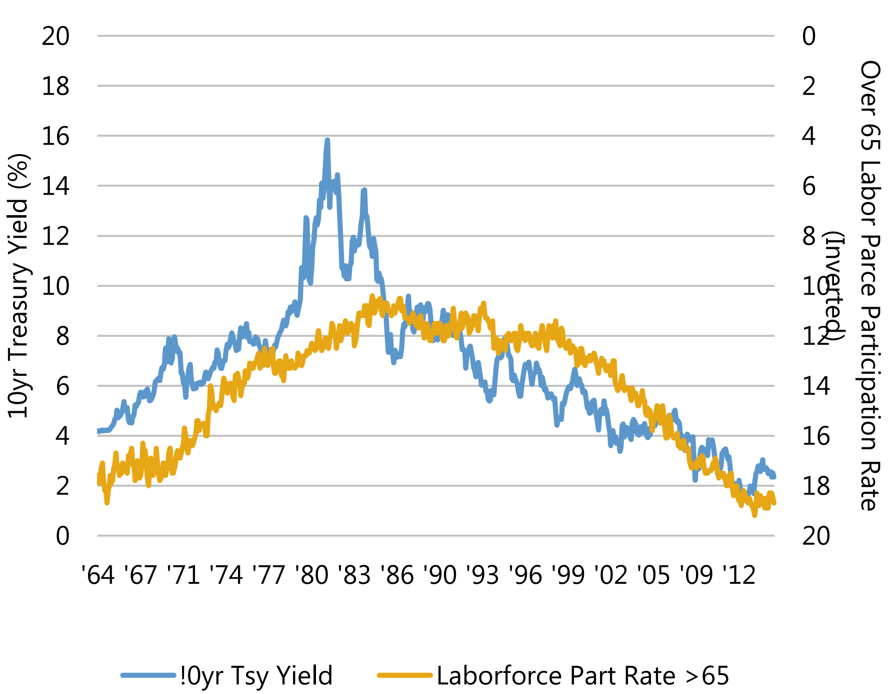
SOURCE: PIMCO, Poterba (2014), Current Population Survey (2013), Survey of Consumer Finances (2010), Bureau of Labor Statistics (2013).

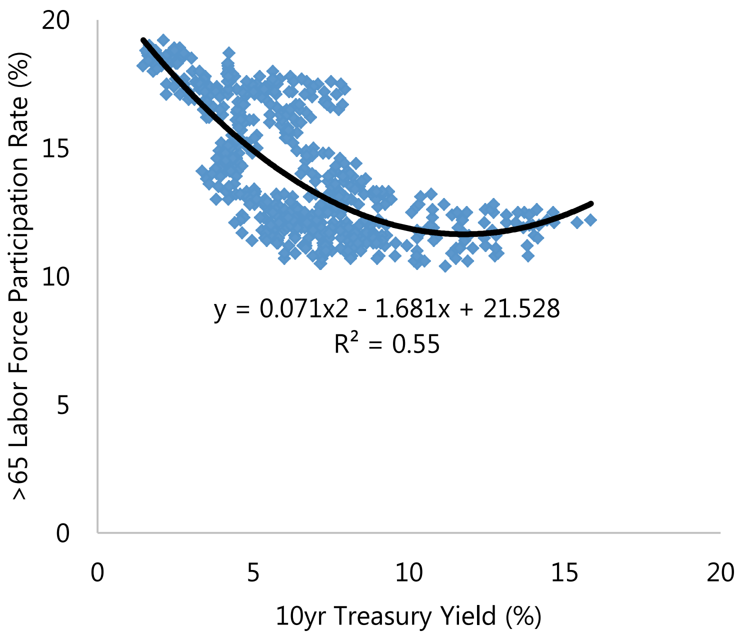
1 Income Sources represent the mean income share multiplied by the mean income for the indicated income quartile.

2 Annuitized Housing Wealth represents the actuarially fair twenty year annuity purchasable given interpolated real estate equity in the indicated income quartile subject to a 25% haircut. Annuity is calculated using the 20 year TIPS yield on the as of date.

3 Pre-retirement income and Housing Wealth by quartile represent linearly interpolated quantiles assuming that household income is 1.6 times personal income (corresponding to the ratio of median household income to median personal income in the United States).

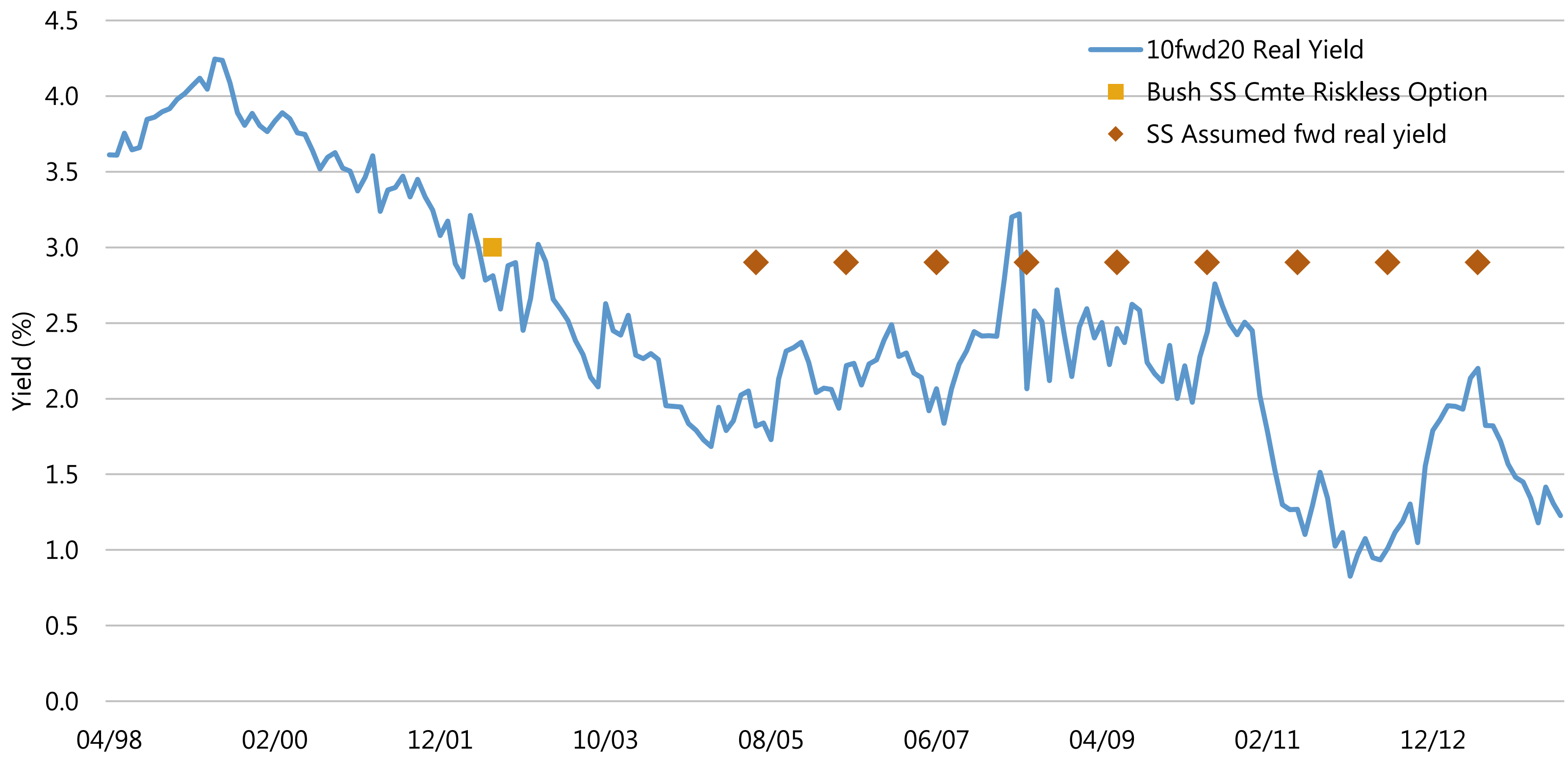
Is there a linkage between the choice to retire and market variables?





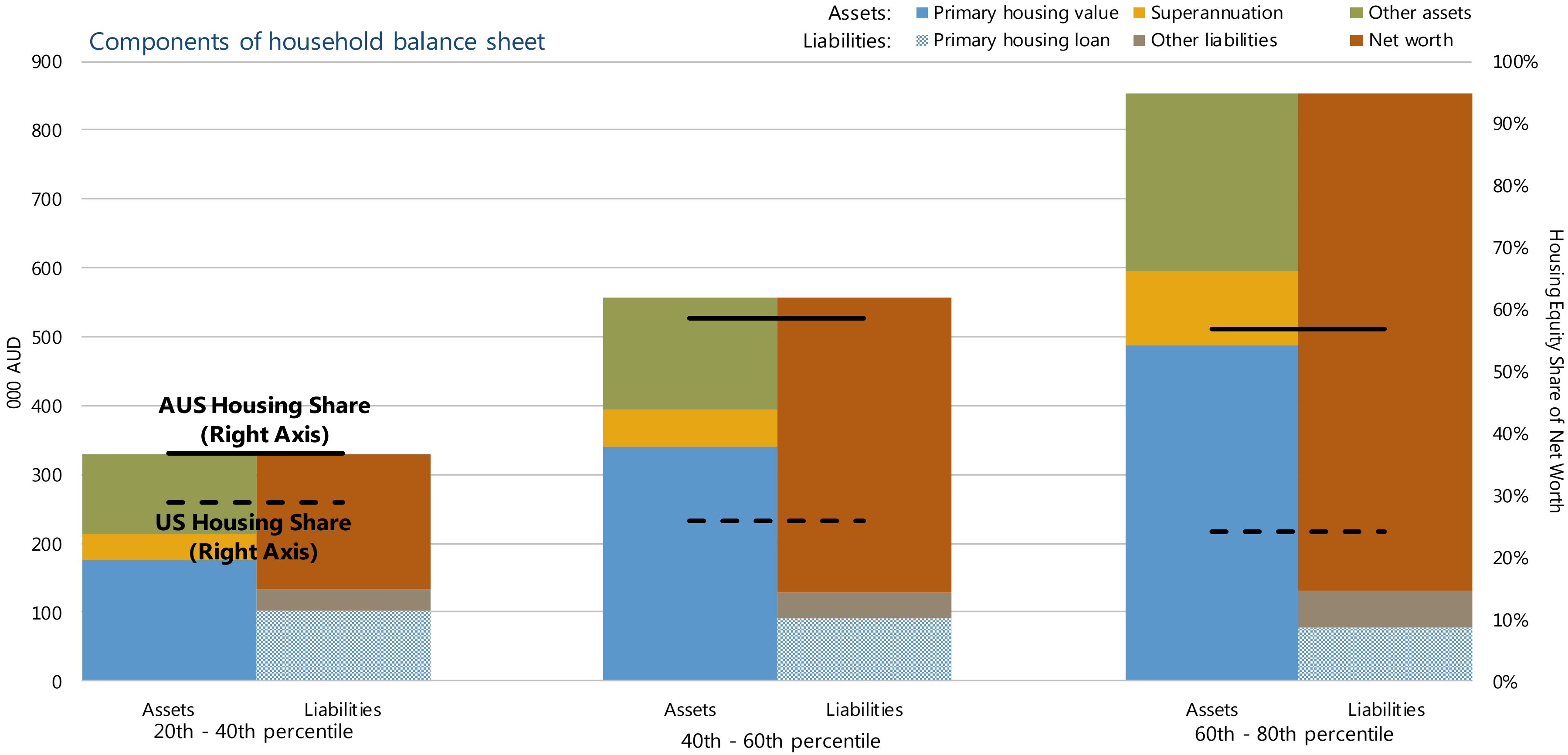
SOURCE: Bloomberg, Bureau of Labor Statistics

Before assessing adequacy, do we need to address our assumption set?



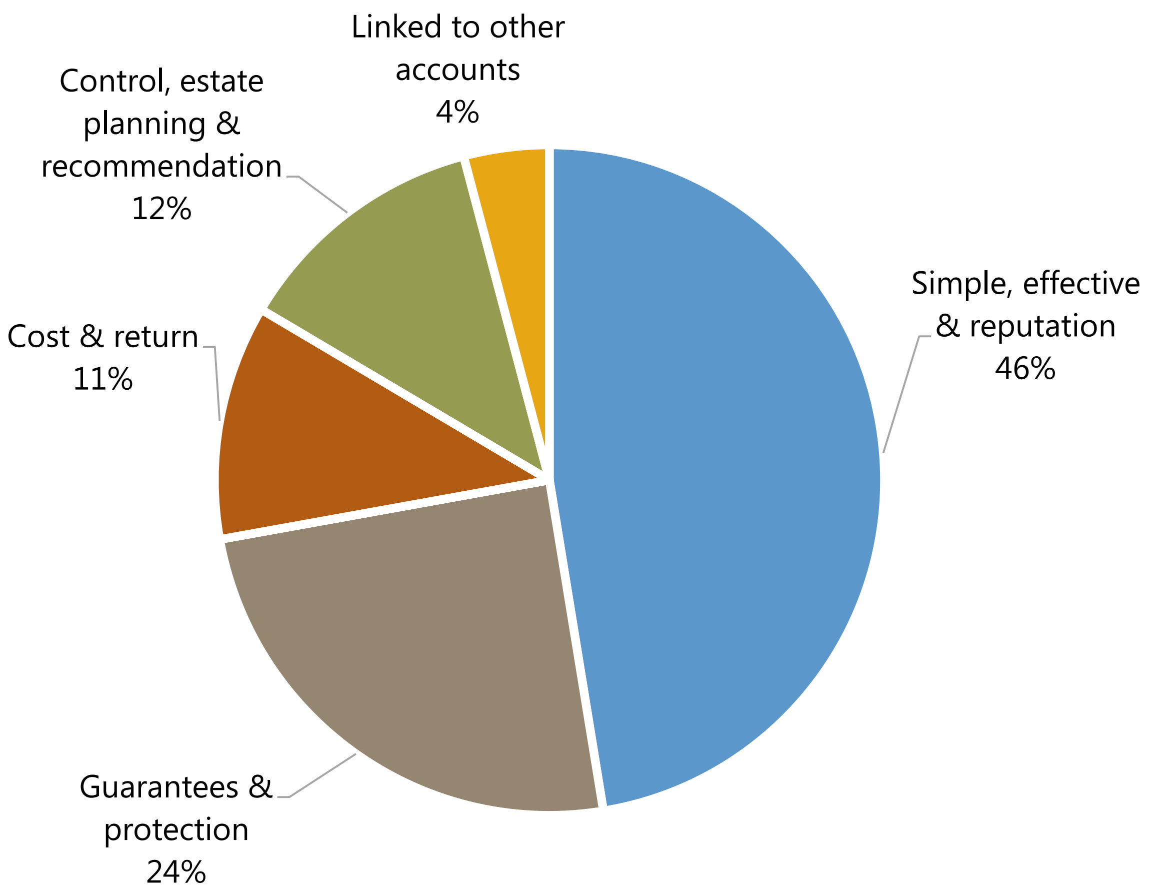
- Market-implied long-term real yields have been below Social Security Trustee's valuation assumptions for a decade

Australia: My home is my castle
First pillar system design creates its own set of risks



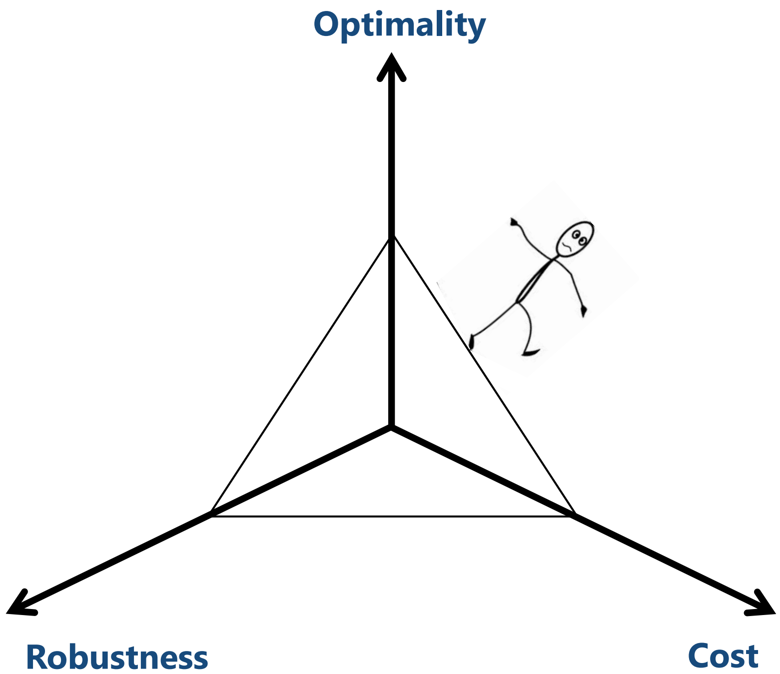
SOURCE: Australia Bureau of Statistics, Household Wealth and Wealth Distributions (2009-2010), Survey of Consumer Finance (2010), PIMCO
All values represent the mean holdings for that quantile. US Net Worth includes the cumulative Social Security contributions of the household at age 64.

Main factors in retail retirement product selection: What are the implications for a D.I.Y. Retirement?



SOURCE: Investment Trends, Retirement Income Report 2014

Tradeoffs become trickier when you are working with legacy frameworks designed in bygone eras



- Social Security (1935)
- ERISA (1974)
- 401(k) (1980)
- Today (????)

If we fundamentally want to address adequacy, will an incremental approach work?

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TALENT • HEALTH • RETIREMENT • INVESTMENTS

WORKFORCE MANAGEMENT ISSUES RELATED TO RETIREMENT PLANS

DECEMBER 11,2014

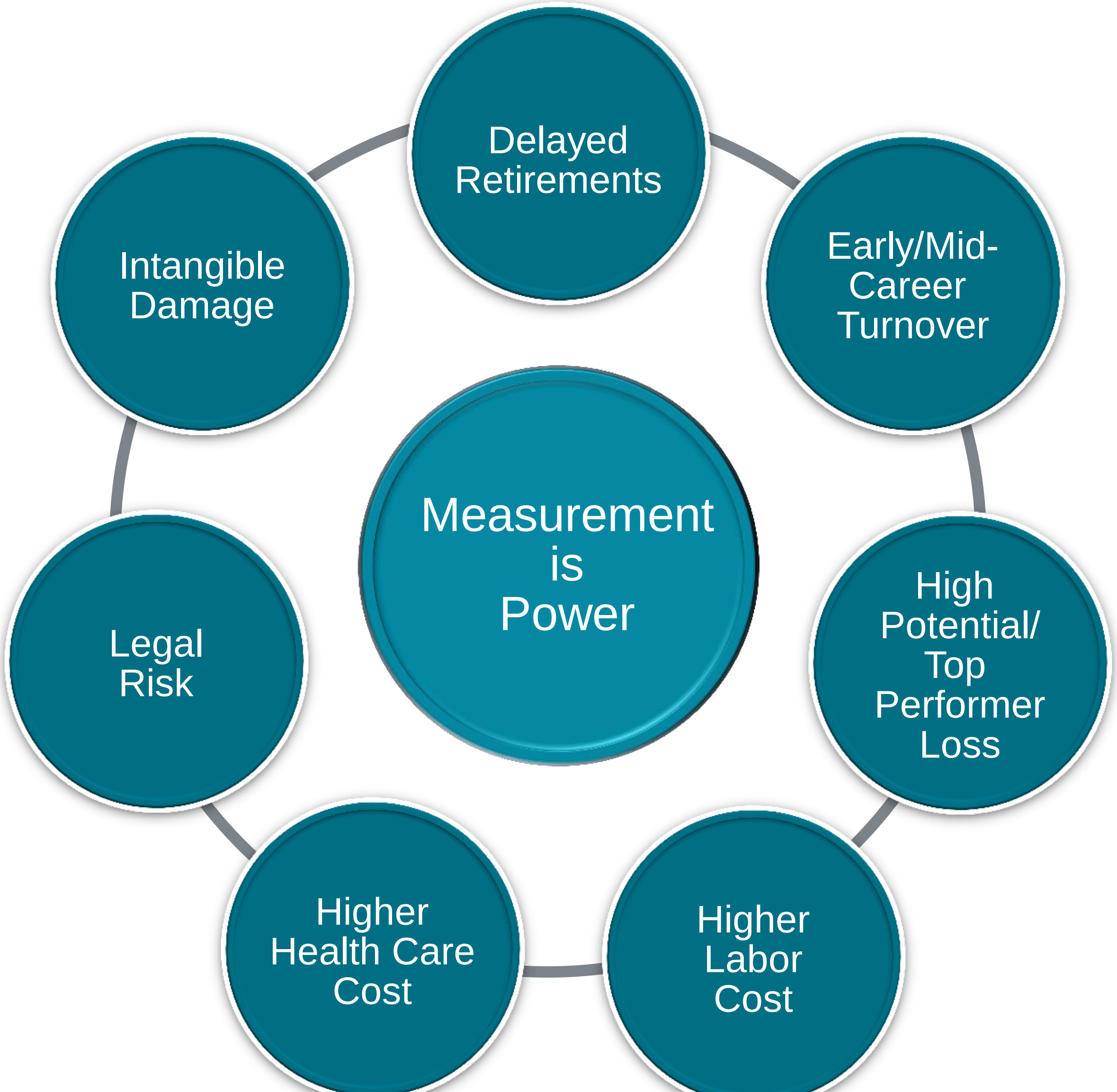
Arthur L. Noonan
Senior Partner

MARSH & McLENNAN COMPANIES

Determining Optimal Plan Design

- Retirement program designs are usually viewed through the lens of finance
- Accordingly, decisions are made on the basis of:
  - Expense and contributions
  - Liability and Risk
- But it is labor productivity that drives true labor cost
- And it is workforce alignment that ultimately determines the contribution of an organization's workforce to business value
- And, as we all know, the retirement decision is ultimately an individual one
- Assessing plan design options, therefore, requires an analysis of:
  - Cost (as has been traditionally performed)
  - Workforce impact (including recognition that desired impact may vary with respect to different employee groups)
  - Ability to address individuality

The Unintended Consequences of Retirement Program Changes



Case Example 1: Confronting the Adverse Impact of a Loss of Incentives to Retire at a Global Consumer Products Company

Situation

- Large, branded company facing slow growth, almost all of which is driven by emerging markets, looks to develop a people strategy that fosters greater customer knowledge, faster, better innovation and stronger workforce diversity
- The company has traditionally built its talent from within, successfully relying on a premium rewards and employment package, to get talent to come and stay
- The company closed its DB plan in the late 1990s

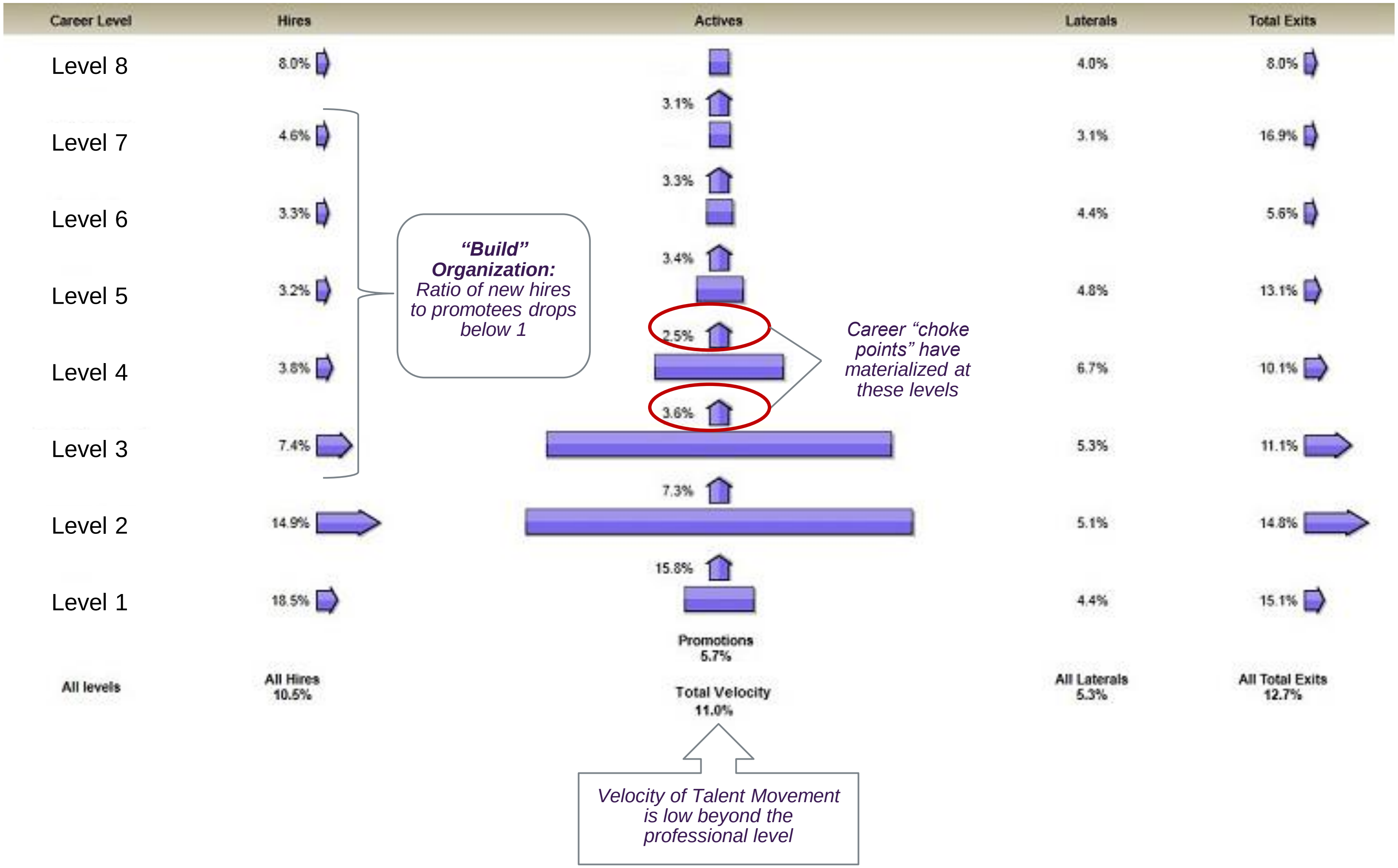
Presenting Problems

- Company experiencing significant back-up in its talent flows as more senior employees delay retirement due to erosion of wealth in retirement plans and high uncertainty about their ability to supplement retirement income from work in a weak economy.
- Absent business growth, this back-up in retirements blocks progression of more junior talent, stalling our careers and generating incentives for higher performers or the more marketable among them to leave prematurely.

Implications

- Low “velocity” of movement, created ***in part*** by the existing retirement program is antithetical to successful realization of the company’s “Build” strategy with serious negative consequences to their business
- In this instance, a retirement program that delivered incentives for retirement eligible employees to leave, would outperform one whose incentives are completely disconnected from tenure

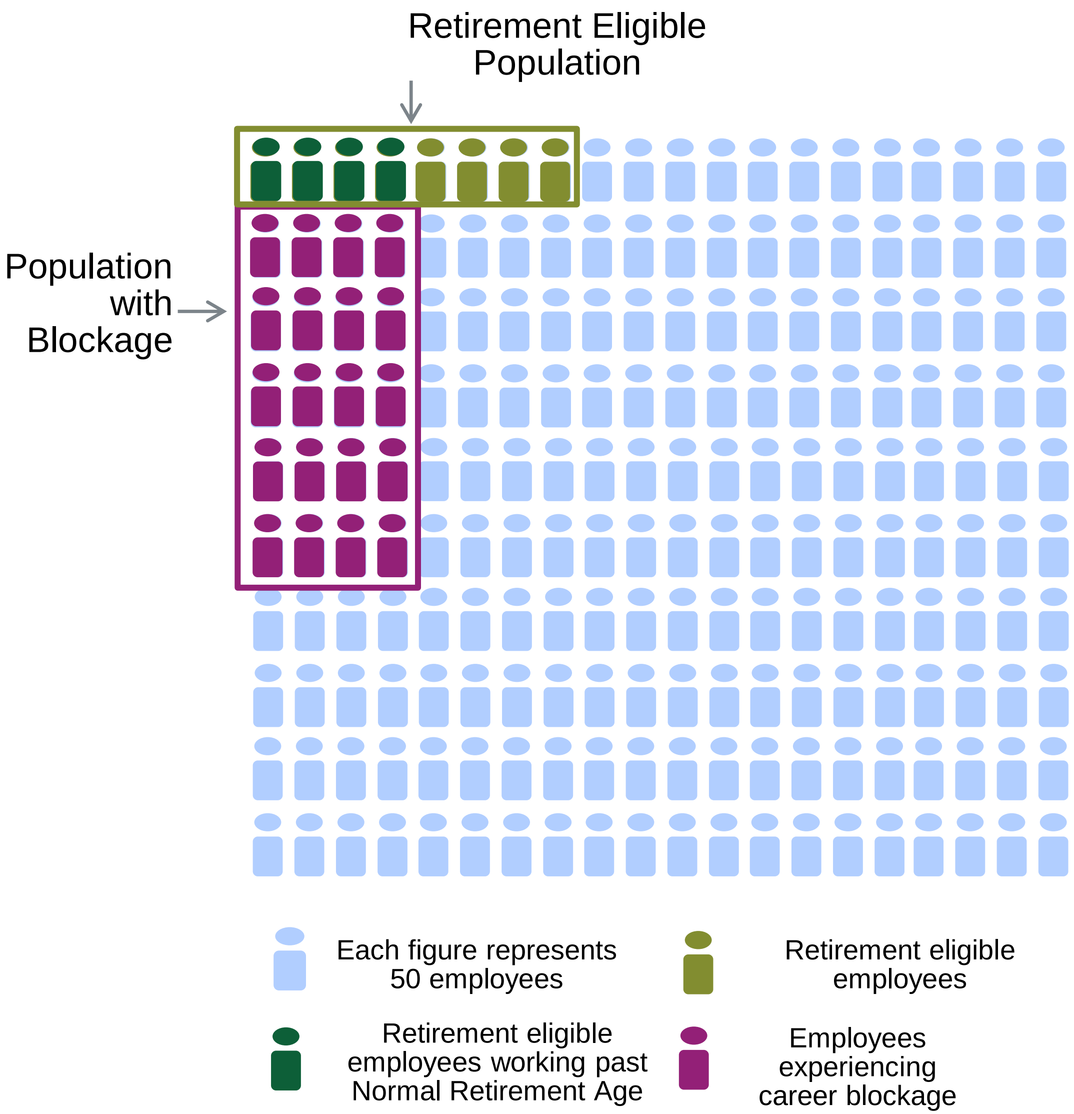
Limited Incentives to Retire - In the Context of Low Growth and a "Build" Talent Strategy - Result in Low Internal Labor Market Velocity, Significant Career Choke Points, and a Serious Drain of Top Talent



DISGUISED CASE EXAMPLE

The Unintended Consequences of an Ineffective Retirement Program

- Each delay in retirement can block 5+ jobs.
- If 4% of your population is retirement eligible and half of those people choose to delay retirement, 10% of your employee population would experience promotion blockage.
- This means 1000 employees would experience promotion delays in a 10,000 employee firm.



Two Approaches to Identifying the Factors that Influence Retirement Decisions at Your Organization – One Relying on What Employees ***SAY***, the Other Relying on What They ***DO***

Conjoint Analysis of Importance

The focus is on stated importance: Employees' judgments about factors influencing the choice to retire

Analytic approach: Maximum difference conjoint analysis in a survey-response format

Strengths: Easy to administer, leverage points for designing a retirement offer

Statistical Modeling of Behavior

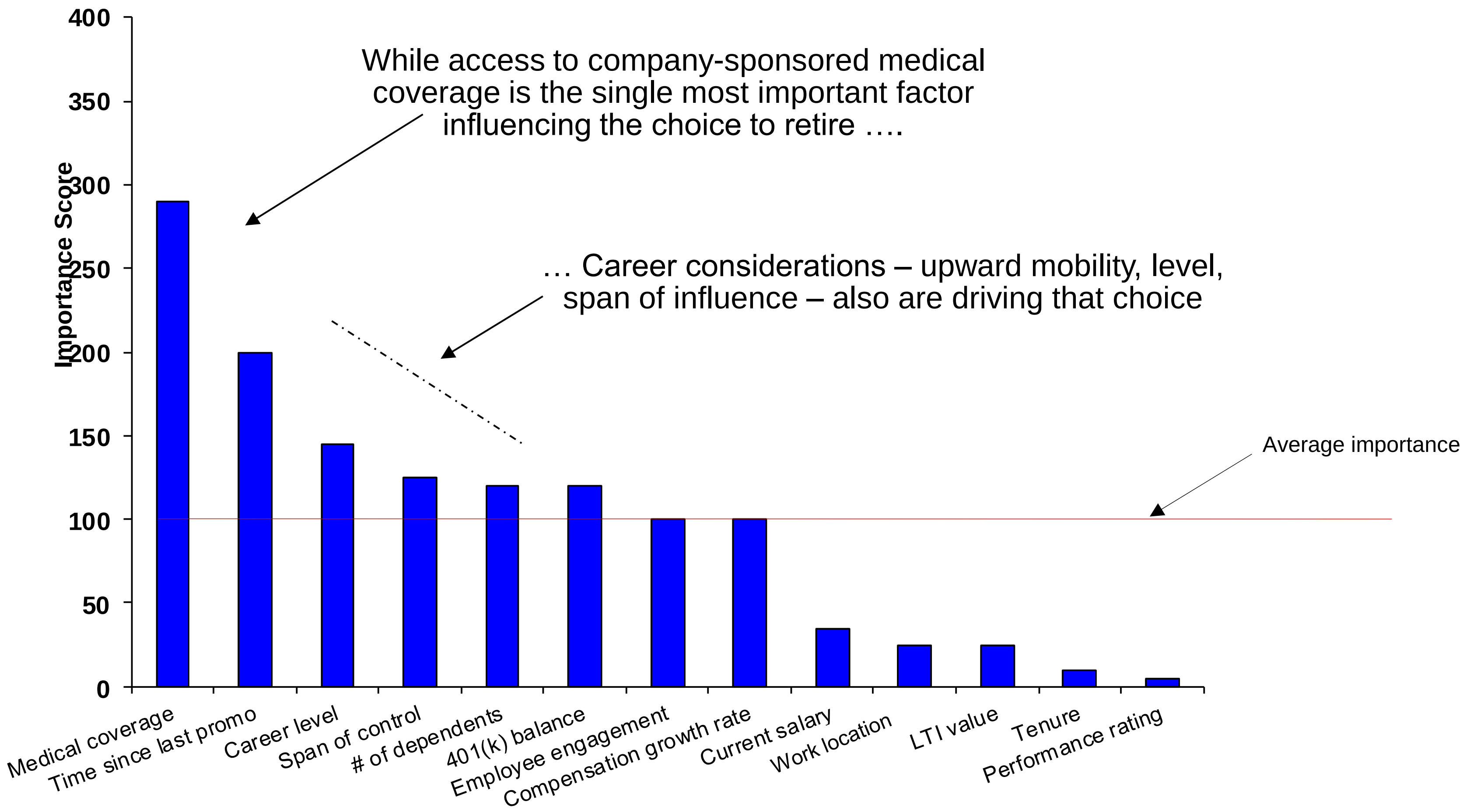
The focus is on behavior: Retiring or not at the point of eligibility

Analytic approach: Statistical modeling of the factors influencing actual choices made by employees

Strengths: Company-specific models, leverage points for designing a retirement offer, predicting acceptance

Many Factors Can Influence the Choice to Retire – Hypothetical ***SAY*** Example

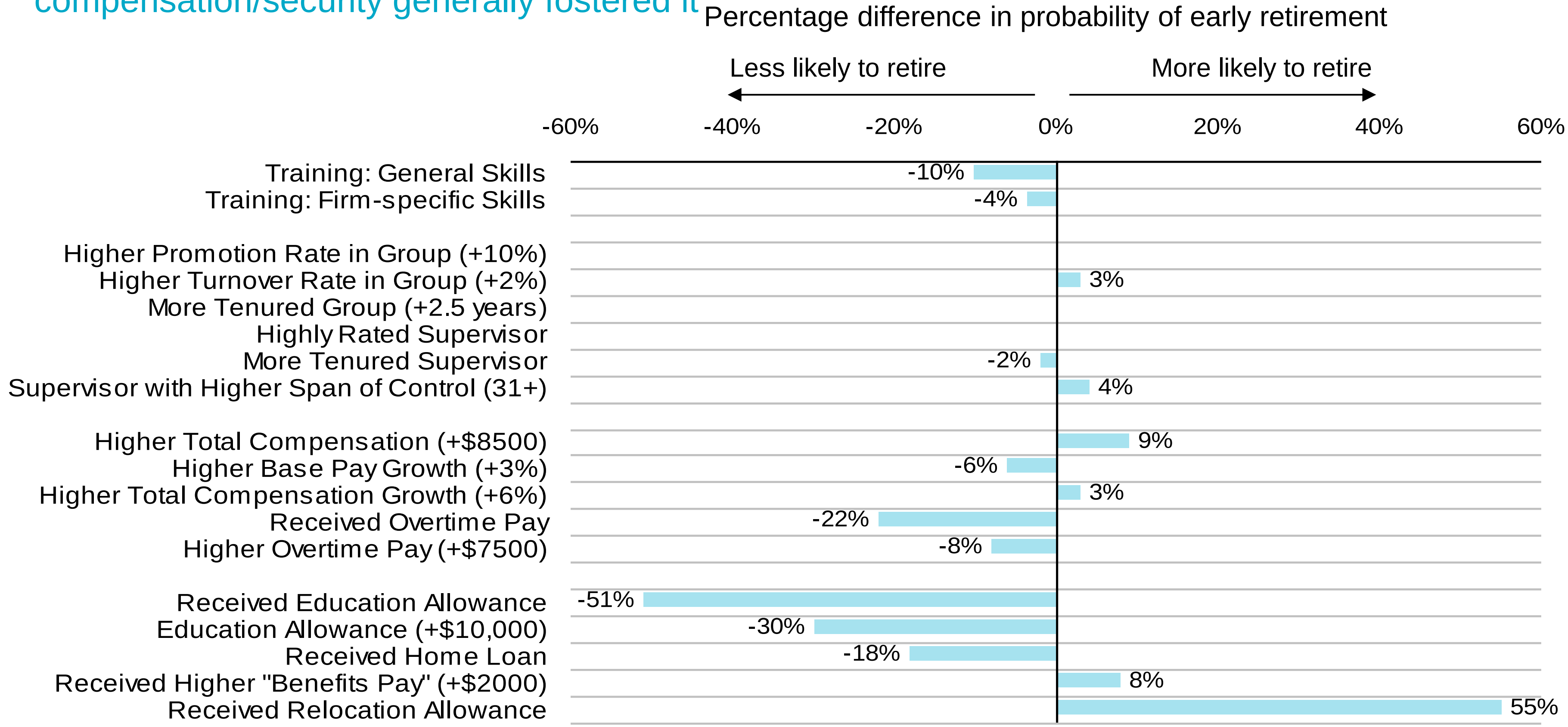
Identifying the Factors that Actually Influence Retirement Decisions is Essential to Designing the Right Solutions for "On Time" Retirement



Importance scores are scaled so that the average score is 100.

This Global Company Statistically Estimated the Drivers of Actual Decisions to Retire Early – an Actual DO Example

Education, training, pay growth and overtime helped delay retirement whereas higher compensation/security generally fostered it



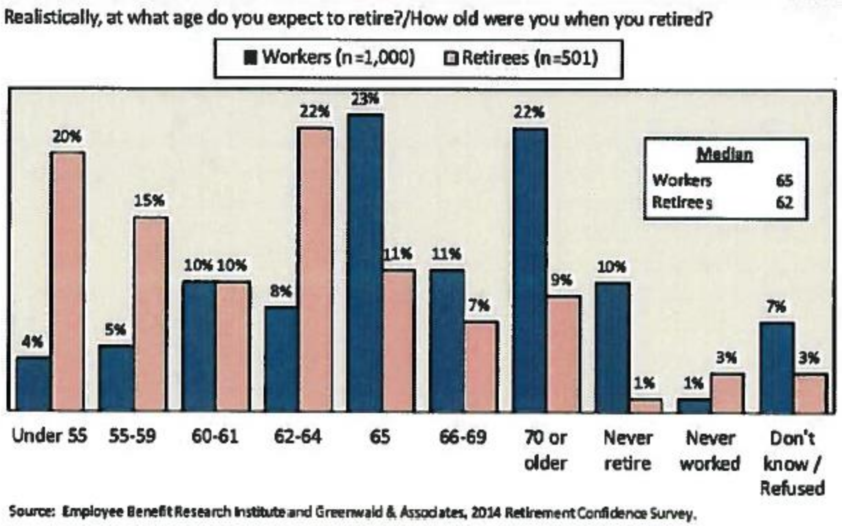
The models on which these results are based control for individual attributes and organizational factors. All effects are significant at the 5% level unless otherwise noted.

DISGUISED CASE EXAMPLE

Stuff Happens

- Retirement happens at a different age than "the plan"
- Workforce exit is for a reason other than retirement
  - – Health
  - – Family
  - – Economic conditions
  - – Retirement of peers

Expected Retirement Age



Finding the Optimal Design for On-Time Retirements

Answer three key questions:

1. What is the true cost of delayed/early retirement for the organization?

2. What is the value of tenure to the business(es)?

3. Is the value of tenure to employees properly aligned with its value to the business(es)?

   And use that information coupled with data on actual retirement choices to resolve the third question:

4. What is the optimal design of inducements for “on-time” exits from the workforce?

With strong workforce analytics, you can bring innovative approaches to solution design and implementation, to best serve your organization’s business interests

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Improve Retirement Income Adequacy through a Behavioral Economics Lens

December 11, 2014

EBRI – ERF Policy Forum

Sibson Consulting

Doc# 5344488 v3

Why Is Retirement Readiness Important?

- Economic Realities:
  - Social Security benefit levels are not sustainable given current tax rates
  - Defined benefit pension plans are on the decline
  - A small percentage of Americans:
    - save enough for retirement
    - are expert investors
- What Happens with Non-Retirement Ready Workforces?

Impact on Workers	**Older:**	Unable to Retire
	Younger:	Deferred Opportunities
Impact on Employers	▪ Higher Labor Costs ▪ Safety & Productivity Concerns ▪ Higher Mid-career Turnover Costs	

Case Study in Retirement Readiness:
Auto Enroll and Escalation (Large Insurance Company)

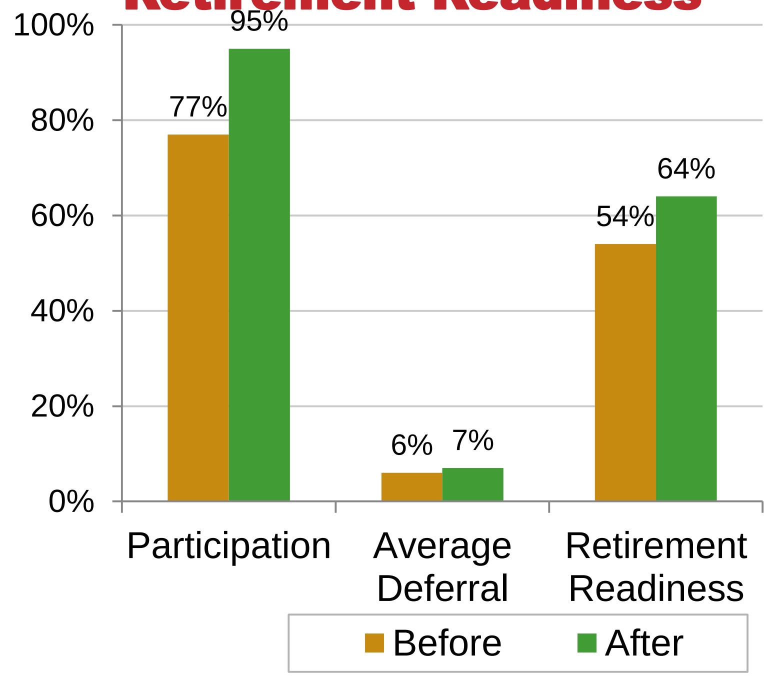
Plan Configuration

- Defined Benefit Pension Plan
  1.25% x Final Avg. Pay
- Defined Contribution Plan
  50% Match up to 6 % of Pay

New Default Configuration

Current Year Contribution Rate	New Year Default Contribution Rate
0%, 1% or 2%	3%
3% - 5%	4% - 6%
6% +	No Change

Participation and Retirement Readiness



Results Over a Six Year Period

- Dramatic increase in 401(k) participation!
- Increase in average deferrals!
- Increase in retirement readiness!

Source: Academy of Behavioral Finance & Economics 2014

Exercise 1:
Who Do You Select as a Mutual Fund Manager?

	Manager A	Manager B
Assets Under Management	$20 Billion	$7.2 Million
Clients	Over 100, including sophisticated investors and well-known families	11 Doctors
Results	Average annual 10 years of 25%; volatility 2% / year	Average annual 6 years of 25%; volatility 14% / year
Portfolio	Basket of S&P 100 stocks with options strategy	30–40 stocks
Offices	New York and London	Omaha, Nebraska

Answer

Manager A
Bernie Madoff, 2001

Manager B
Warren Buffett, 1962

HERDING BIAS: Gravitating to an investment opportunity based principally on the fact that many others are doing so.

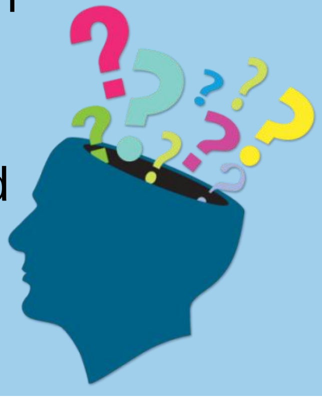
Have You Seen These Behaviors?

Participants

- Spend little time planning for retirement, reviewing progress and a majority regret their decisions
- Don't optimize employer matching contributions
- Under-choose target date funds
- Under-select annuities
- Over-react to the latest DJIA report
- Few participants access the substantial resources available for:
  - financial goal setting
  - analyzing investment alternatives
  - developing tax strategies
  - learning smart consumer practices

Investment Committees

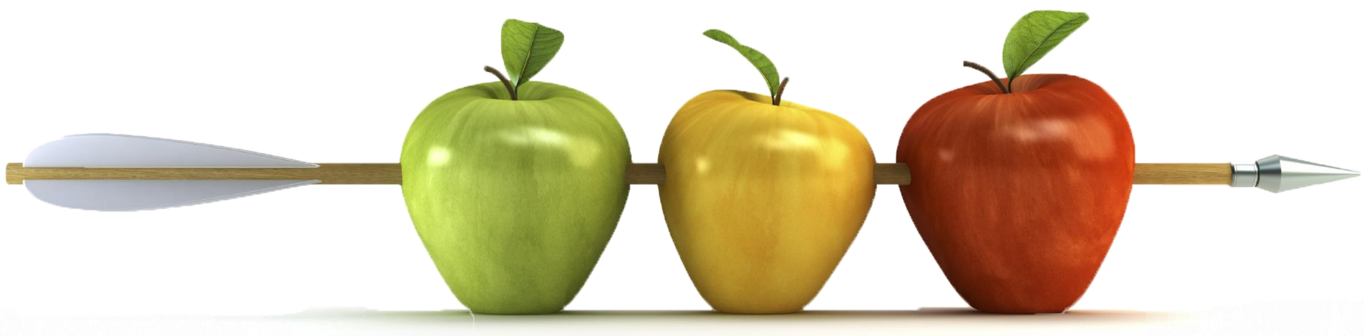
- Think participants make decisions rationally and with relative competence (just like committee members)
- Try to educate participants while conveying a neutral point of view and thereby under-emphasize intelligent choices
- Focus on "how we did lately" and "what is the near term investment outlook"
- Make investment manager picks based on charisma



How People Decide

➢ **Rational thinking is part of the process**

- People are motivated differently
- People have differing levels of competence, confidence and time availability to improve their health and their consumer choices
- People use mental shortcuts and rules of thumb to evaluate choices
- People are influenced by content and by framing
- People think rationally at times, intuitively at all times and emotionally with every choice they make.



"…to make a decision, emotion is the necessary trigger. Without emotion, one would be reduced to the state of an idiot savant who goes on endlessly calculating without the ability to make a choice."

* *Perceptions of Financial Risk: Axioms and Affect,* Robert A Olsen. The Icfai University Press (2008).

Behavioral Economic Tool Kit

1) Behavioral Biases as Barriers and as Bridges to Retirement Readiness
2) Choice Architecture
3) Designing Defaults
4) Hyperbolic Discounting and Consumption v. ROI Framing
5) Workforce Segmentation and Variable Messaging
6) Improving Committee Operating Models to Minimize Behavioral Risk

What's Going On When Plan Participants Make Sub-optimal Decisions: Human Nature!

Mental Shortcuts as BARRIERS TO CHANGE	Examples with Retirement Plans
Complexity Aversion and Clue Seeking Bias	Look at all of these investment options. Well, the Company must have put the Money Market Fund at the top of the list for a good reason. I will choose it.
Hyperbolic Discounting	I can spend that 3% of salary on vacation in Orlando or put it away in the 401(k). What is the big deal anyway about compound interest?
Sentinel Event Bias	My former boss chose the annuity at retirement and died young. I won't make the same mistake—give me the lump sum!

Behavioral Biases Can Be Tapped to Improve Choice-Making

Mental Shortcuts as BRIDGES TO CHANGE	Examples with Retirement Plans
Availability Heuristic	Everywhere I look I see messages about "saving for tomorrow," "tax deferral" and "rising investor confidence."
Clue Seeking Bias	Nudging & Simplicity (use obvious cues) A. Wealth Building Fund for People Your Age B. Balanced Fund C. Click here for: **Participant Directed (Expert Investor) Options**
Overvaluing Low Probability Events	Are you concerned about: • outliving your financial nest egg? • dying young and losing most of your pension? Click here for the **Value Preservation Option**!

Everybody Loves Choice!

	6 kinds of jams	24 kinds of jams
Shoppers who stopped	40%	60%

Source: Iyengar & Lepper (2000)

Complexity Aversion is Paralyzing

	6 kinds of jams	24 kinds of jams
Shoppers who stopped	40%	60%
Shoppers who bought jam	30%	3%

Source: Iyengar & Lepper (2000)

Complexity aversion is a significant behavioral barrier to mitigating longevity risk; annuity product portfolios are complicated.

Countering Complexity Bias

TWO APPROACHES TO CONFIGURING DISTRIBUTION OPTIONS

Typical Retirement Plan Election Language	Simplified Retirement Election Language
• If you are married when your benefit begins, your benefit will be paid to you as a Qualified Joint and Survivor Annuity. A Qualified Joint and Survivor Annuity provides reduced, equal monthly payments to you during your lifetime and, if your spouse lives longer than you, to your spouse for your spouse's lifetime. Although your monthly benefit payments are reduced, the payments to you and the survivor benefit for your spouse have the same actuarial value as the Single Life Annuity described above. If you are married and your spouse consents, you may elect to receive one of the optional forms of payment described below. All of the optional forms of payment have the same actuarial value as the Single Life Annuity. • **Single Life Annuity:** Monthly Benefit = $1,000 • Joint and Survivor Annuity = $667, reducing to a $500 survivor benefit	Choose one of the following monthly income streams for your retirement benefit: ☐ $667 monthly income while you and your spouse are both living. $500 monthly income for your spouse after you pass away. ☐ $1,000 monthly income while you and your spouse are both living. $0 monthly income for your spouse after you pass away. *Under this option, your spouse must sign a notarized consent form.*

Framing to Increase Savings Rates

Typical DC Plan Choice Structure:
50% Match up to 6% of Pay

Employee Deferral	Company Match	Total Contribution
0%	0.0%	0.0%
2%	1.0%	3.0%
4%	2.0%	6.0%
6%	3.0%	9.0%
8%	3.0%	11.0%
10%	3.0%	13.0%
12%	3.0%	15.0%

Implied Messages

- Any contribution other than 0% is good
- The right amount to save is 6%
  because the company caps its match at 6%
- A total contribution at 9% of pay is sufficient for retirement readiness

BEHAVIORAL ECONOMIC SOLUTION

Revised DC Plan Choice Structure: 50% Match up to 6% of Pay			
Employee Savings Rate	**Employer Contribution**	**Total Contribution**	**Lost Employer Match**
12%	3%	15%	0%
10%	3%	13%	0%
8%	3%	11%	0%
6%	3%	9%	0%
4%	2%	6%	1%
2%	1%	3%	2%
0%	0%	0%	3%

Techniques

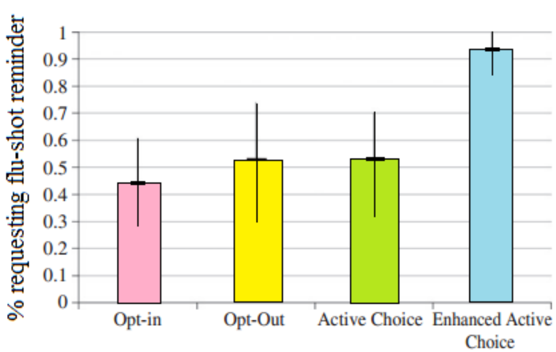
- Anchor attention toward the higher savings rates.
- Emphasize loss with lower savings rates.

Choice Architecture and Enhanced Active Choice

How you configure choices impacts decisions:

- **Opt - In:** Do you want to be reminded to rebalance your 401(k)? Email us!
- **Opt - Out:** We will remind you to rebalance unless you say no.
- **Active Choice:** Do you want to be reminded to rebalance? Yes or No
- **Enhanced Active Choice:** Do you want to be reminded?
  If you say "No," chances are: Yes or No
  - you will forget to rebalance,
  - you will lose your "vigilant investor rating,"
  - your investments may suffer.

Enhanced Active Choice and Flu Shot Compliance



Keller et al. (2011), *Enhanced active choice: A new method to motivate behavior change*, Journal of Consumer Psychology

Defaults v. Active Choice

- State University Retirement System of Illinois
  - 3 complicated retirement plan options (defined benefit, hybrid, defined contribution)
  - new hires must decide within 6 months
  - decision is permanent
- 22% Default
- Who is less likely to default?
  - risk takers
  - financially literate
  - advanced degrees in subject matter area
  - females
  - wealthier individuals
  - those lacking confidence in state legislature

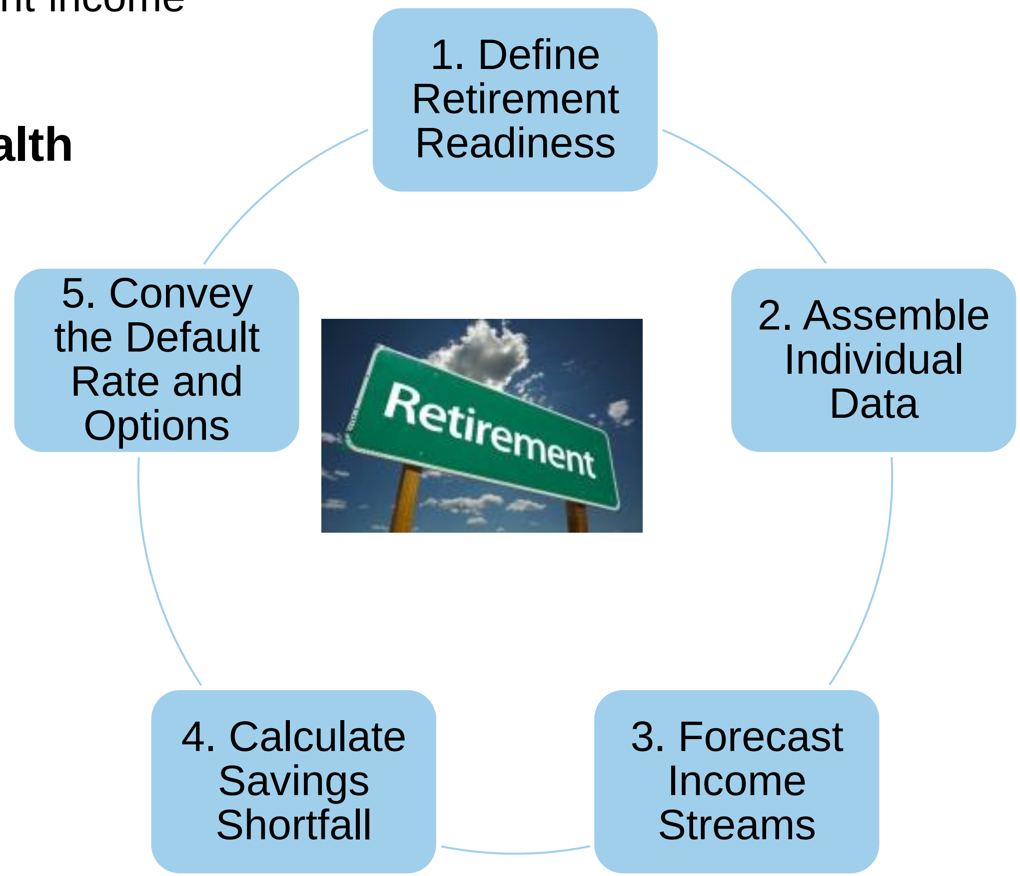
Why People Default?	
Deficient Information	43%
Clue Seeing Bias	9%
Deliberate Choice	24%
Procrastination	24%

Do people regret the plan choice they made?	
Active choosers	16%
Defaulting people	35%

Source: *The Downside of Defaults*, Jeffrey R. Brown, Anne M. Farrell, Scott J. Weisbenner, NBER, December 2012

How Personalized Defaults Work?

- **Define standard(s) for retirement readiness.**
  - retirement income > 70% of pre-retirement income
  - wealth > 11 times final average earnings
- **Assemble data on accumulated wealth for each individual.** (i.e. DC retirement plan balance, personal savings)
- **Forecast income streams for each individual.** (i.e. social security and pension income)
- **Calculate needed future savings for each individual to be retirement ready.**
- **Set each individual's default contribution rate for the next plan year at an amount that generates a "retirement-ready" future.**
  (as with all defaults, individuals can change their mind.)



Exercise 2:
You Meet a Generous Benefactor, He Says:

- Congratulations, you have won a prize. I have a $100 bill in my right pocket; I have a bank cashiers note payable for $120 in 365 days.

- Which do you prefer:

  - A $100 bill at this very moment.

  - A $120 cashiers note payable in 365 days from a reputable, solvent, convenient bank

Exercise 2:
You Meet a Generous Benefactor, He Says:

- Other Audience Responses:

Which do you prefer:

- ❑ $100 now

  (human resource generalists and most Americans)

- ❑ A $120 cashiers note payable in 365 days

  (actuaries, investment managers and advisors)

- Hyperbolic Discounting: In consumer choice-making, the preference of smaller - immediate rewards over later - larger rewards to a much greater extent than a present value analysis would indicate.

- Experts Certainty Bias: The tendency of experts to:

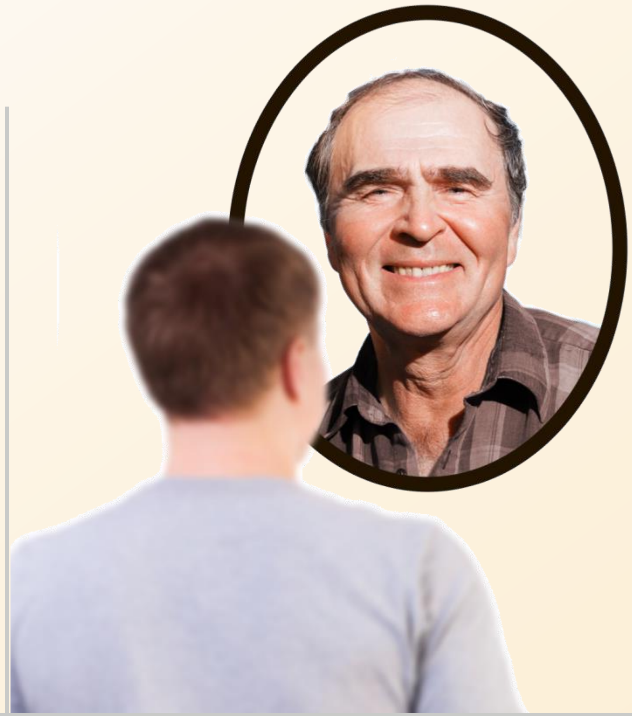
- ignore data contrary to their informed experience and
- believe that most people analyze choices just as they do.

Countering Hyperbolic Discounting
(Encouraging People to Save)

How do we help a 30 year old view what their life will be like at age 70?

Participants who saw their ***current*** selves contributed 4.4% toward retirement

Participants who saw their ***future*** selves contributed 6.2% toward retirement



Source of Data: "Increasing Saving Behavior Through Age-Progressed Renderings of the Future Self," Hal E. Hershfield, et al, *Journal of Marketing Research* Vol. XLVIII, S23–S37, November 2011

Employees are Savvy Consumers; not Great Investors

1. **Construct a bridge between life today and in retirement!**
2. **Focus as much on consumption as asset accumulation**

Save **9%** of pay

Eat steak and lobster;
live the good life!

Travel to exotic locations;
live the good life!

Save **6%** of pay

Eat hamburger.

Travel to a nearby resort.

Save **2%** of pay

Eat processed bologna
for the rest of your life.

Vacation at your local
community center.

Sub-optimal Investment Decisions
Countering Regret Aversion

With Panic Comes a Shift in Investment Style

Investor Style and Recent Performance

- Capital Preservation v. Yield Seeking Style
- Substantial Recent Loss or Gain Relative to Benchmark

Investment Objective:
ASSET PRESERVATION

When Recent Returns are Well **BELOW** Target

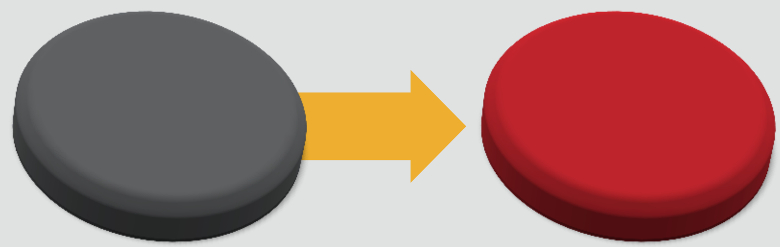
Natural Tendency: **Conservative Investing**

Risk Seeking Behaviors with Familiarity Bias

Potential Nudge: Auto-rebalance with messages of vigilance

Investment Objective:
YIELD SEEKING

When Recent Returns are Well **ABOVE** Target



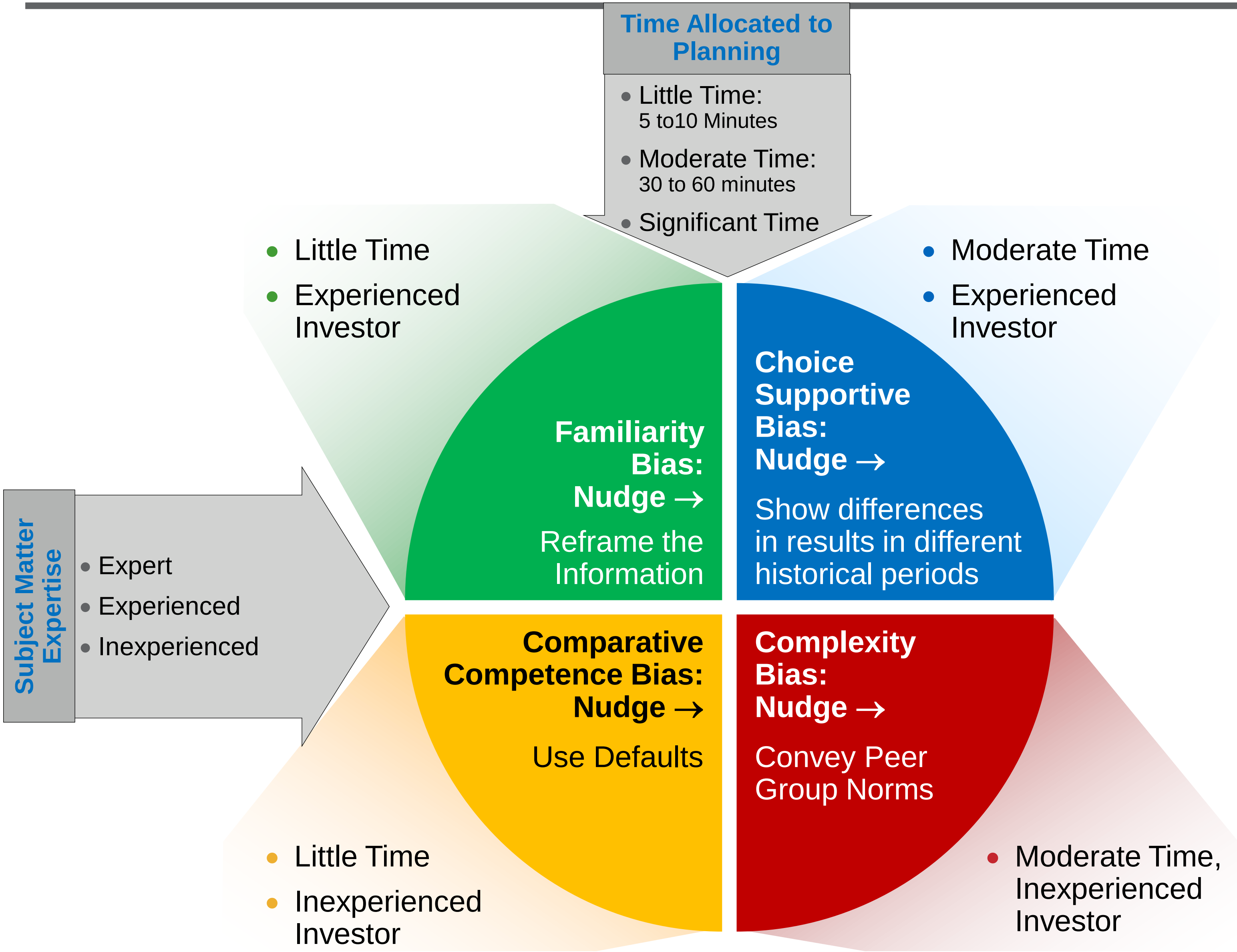
Natural Tendency: Aggressive Investing

Risk Avoidant Behavior

Potential Nudge: Lost opportunity regret with messages of opportunity

Source: Adapted by Sibson Consulting from Xi Zou, London Business School. Sibson uses “investor style” in a narrower context than Zou’s uses of “Prevention” and “Promotion” biases in a broad “life motivation” context (Personal Communication, 2013).

Variable Messaging v. "One Size Fits All" Communication

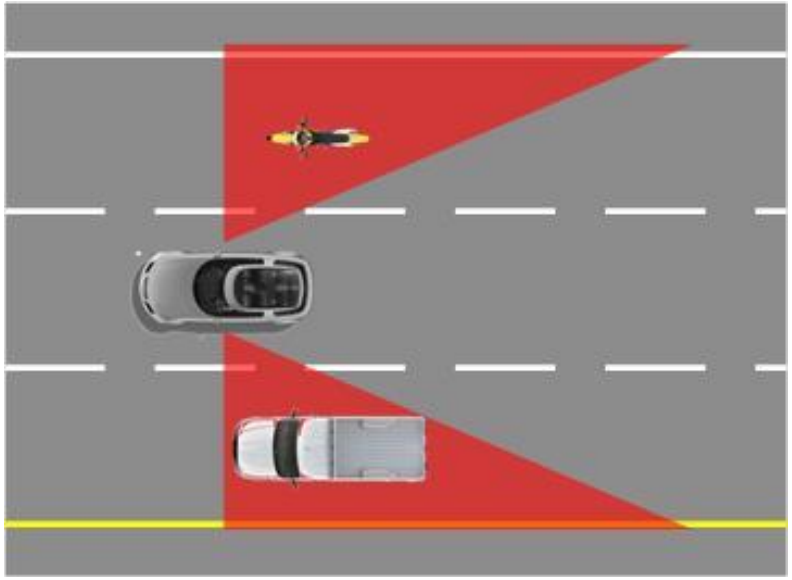


Source: Sibson Consulting 2014

Committee Biases

Expert's Certainty Bias

"Sure, a lot of people are prone to biases, but not us."



IDEA: Team building exercises.

Availability Heuristic

"The good news is everywhere; the S&P 500 continues to rise; the DJIA is at an "all time" high. The forecast is bullish. I know we are outside of IPS guidelines; so let's change the guidelines."

IDEA: Assign a committee member to take a contrarian view.

Suggestions for Investment Committees
Creating High Performing Teams

Form Committees with Diverse Perspectives

Conduct Periodic Training on Bias Avoidance and Framing Effects

Align Advisors' Framings with Investment Policy

Execute an Operating Model Designed to Avoid Making Suboptimal Decisions

Key Takeaways

- There are a number of documented behavioral biases that impact human behavior
- These biases have a substantial influence upon investment and financial decisions
- They impact individuals, Committees, and Markets
- There are ways to minimize the impacts for your participants and plan assets
  - Understand these biases and how they operate
  - Appropriately frame information
  - Apply contrarian thinking
  - Create high performing teams
- Have a frank and thoughtful discussion about your organizational goals, benefits philosophy and ethical concerns about influencing workforce behavior

Appendix

Motivations, Emotions and Engagement Triggers

Emotion is critical to decision making; recognize that different people are motivated differently.

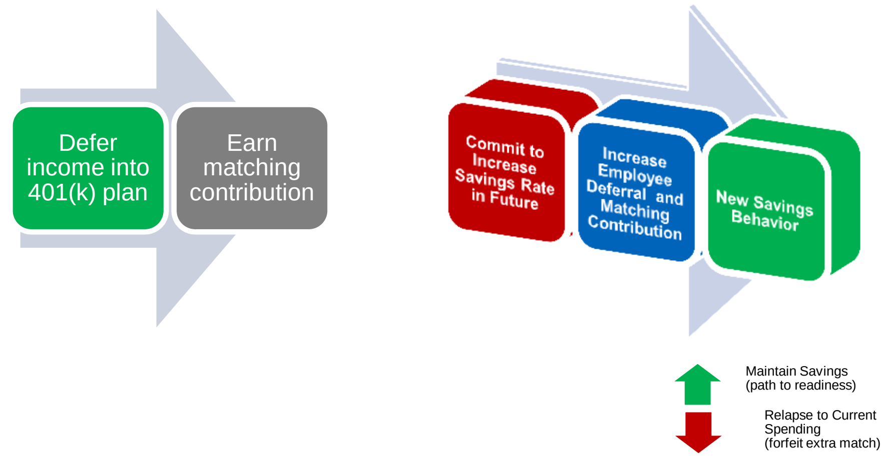
Motivation Basis	Emotional Triggers Leading to a Response	Methods to Gain Attention
Intrinsic Reward Seekers	Appeal to Intellect and to Personal Curiosity	Inspire Thinking about New Possibilities
Extrinsic Reward Seekers	Appeal to Financial Gain and Personal Vanity	Provide Incentives and Socialization
Disengaged	▪ Instill Fear ▪ Convey Hope	Intervention

Source: Sibson Consulting

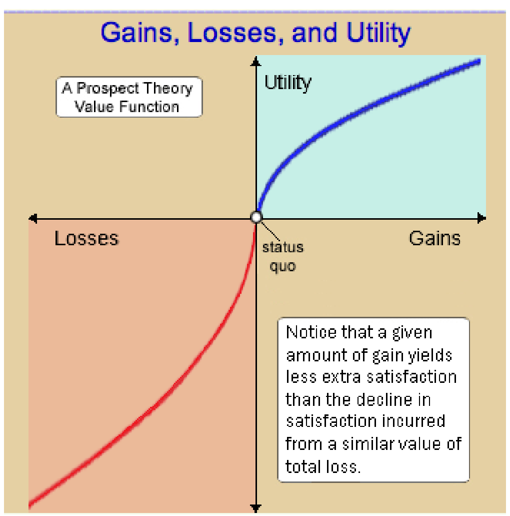
Behavioral Economics and Choice Reconfiguration

- Influence attitudes about “saving and investing.” Add “consumption” frames of reference
- Initiate behavior change with pledges and pre-commitments
- Couple economic incentives with easy election processes
- Frame and time choices to counter:
  - procrastination
  - hyperbolic discounting
- Leverage:
  - optimism bias
  - loss aversion and lost opportunity regret
- Counter probability neglect with emotional stories
- Recognize the power of defaults and of small, relevant active choices
- Create variable choice architectures based on individual preferences and expertise

PRE-COMMITMENT STRATEGIES



Loss Aversion



Source: Prospect Theory; Daniel Kahneman

How to Influence Participant Behavior Change to Improve Retirement Readiness & Financial Wellbeing

Establish Personal Relevance

Establish personal relevance by using familiar references and consistent branding.

Nudge formal and informal leaders who are admired and liked.

Trigger Emotional Reactions

Trigger emotional responses (hope, fear, excitement, adventure, love, greed, caring).

Define Clear Choices and Convey Value

Define clear choices about trade-offs between financial options and quality of life.

Convey value in making smart choices:

- ✓ live well
- ✓ care for others

Ask a Small Related Request

Ask employees to complete a small task related to a larger goal:

- ✓ pledge to save more for tomorrow
- ✓ visit the retirement planning website
- ✓ pay back the loan to yourself quickly

Channel to the Best Resource

Channel employees to the best **high quality / easy-to-use** resource available:

- ✓ retirement calculators
- ✓ pre-retirement counselors
- ✓ financial advisors

Design and frame defaults carefully.

Reinforce Positive Behaviors

Exercise 3:
Apply Evaluation Criteria to Select a Fund Manager

SCENARIO:

Select Mutual Fund X or Y based on these evaluation criteria and scoring.

	Performance History (50%)			**Style Consistency & Management** (50%)		
	Trustee 1	**Trustee 2**	**Trustee 3**	**Trustee 1**	**Trustee 2**	**Trustee 3**
Fund X	7	7	9	9	8	7
Fund Y	8	8	7	7	9	8

COMMON SELECTION RULE:

Select Highest Weighted Average Score

Fund X Average = **7.83**, Fund Y Average = **7.83**

- Now, what do you do?

Investment Committee Decision Rules

Common Rule Used for Resolution:

- Select the Proposal Winning "Majority of Criterion"

	Performance History (50%)			**Style Consistency & Management** (50%)		
	Trustee 1	**Trustee 2**	**Trustee 3**	**Trustee 1**	**Trustee 2**	**Trustee 3**
Fund X	7	7	9	9	8	7
Fund Y	8	8	7	7	9	8

Fund Y wins the majority of the contests.

	Trustee 1		**Trustee 2**		**Trustee 3**	
	Perf (50%)	**Mgmt** (50%)	**Perf** (50%)	**Mgmt** (50%)	**Perf** (50%)	**Mgmt** (50%)
Fund A	7	9	7	8	9	7
Fund B	8	7	8	9	7	8

EVEN THOUGH THE SCORING IS IDENTICAL:
Grouping at Trustee Level: Fund A wins
Grouping at Criterion Level: Fund Y wins

IDEA: When scoring is close, determine if there is a framing effect.

Making Every Connection Count

DST's Applied Analytics Group

December 2014

DST

Helping customers leverage data to make informed business decisions.

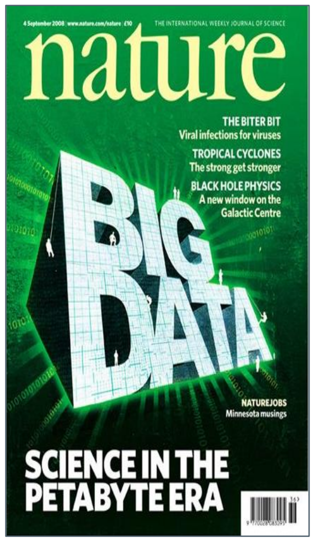
DST Applied Analytics Group

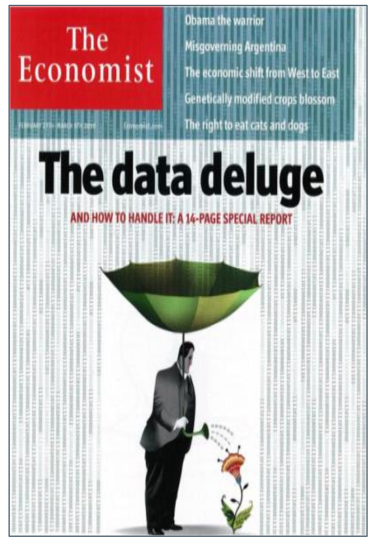
How valuable are

traditional success measures?

- Limited view of the customer
- Based on historic view
- No action taken


Harvard Business Review
GETTING CONTROL OF
BIG DATA


nature
THE BITER BIT
Viral infections for viruses
TROPICAL CYCLONES
The strong get stronger
BLACK HOLE PHYSICS
A new window on the Galactic Centre
BIG DATA
NATUREJOBS
Minnesota musings
SCIENCE IN THE PETABYTE ERA


The Economist
Obama the warrior
Misgoverning Argentina
The economic shift from West to East
Genetically modified crops blossom
The right to eat cats and dogs
The data deluge
AND HOW TO HANDLE IT: A 14-PAGE SPECIAL REPORT


POPULAR SCIENCE
THE FUTURE NOW
THE CONTROL CENTERS
OFFICER ALGORITHM
NEW WAYS OF SEEING
PLUS
SPECIAL ISSUE
DATA IS POWER
HOW INFORMATION IS DRIVING THE FUTURE


Government Executive
MARCH/APRIL 2013
Does Government Ever Really Change?
Five Ways Women Get Ahead
BIG DATA
HOW IT'S MAKING AGENCIES SMARTER

90% of the world's data was generated in the past 2 years

-U.S. Chamber of Commerce Foundation, 2013

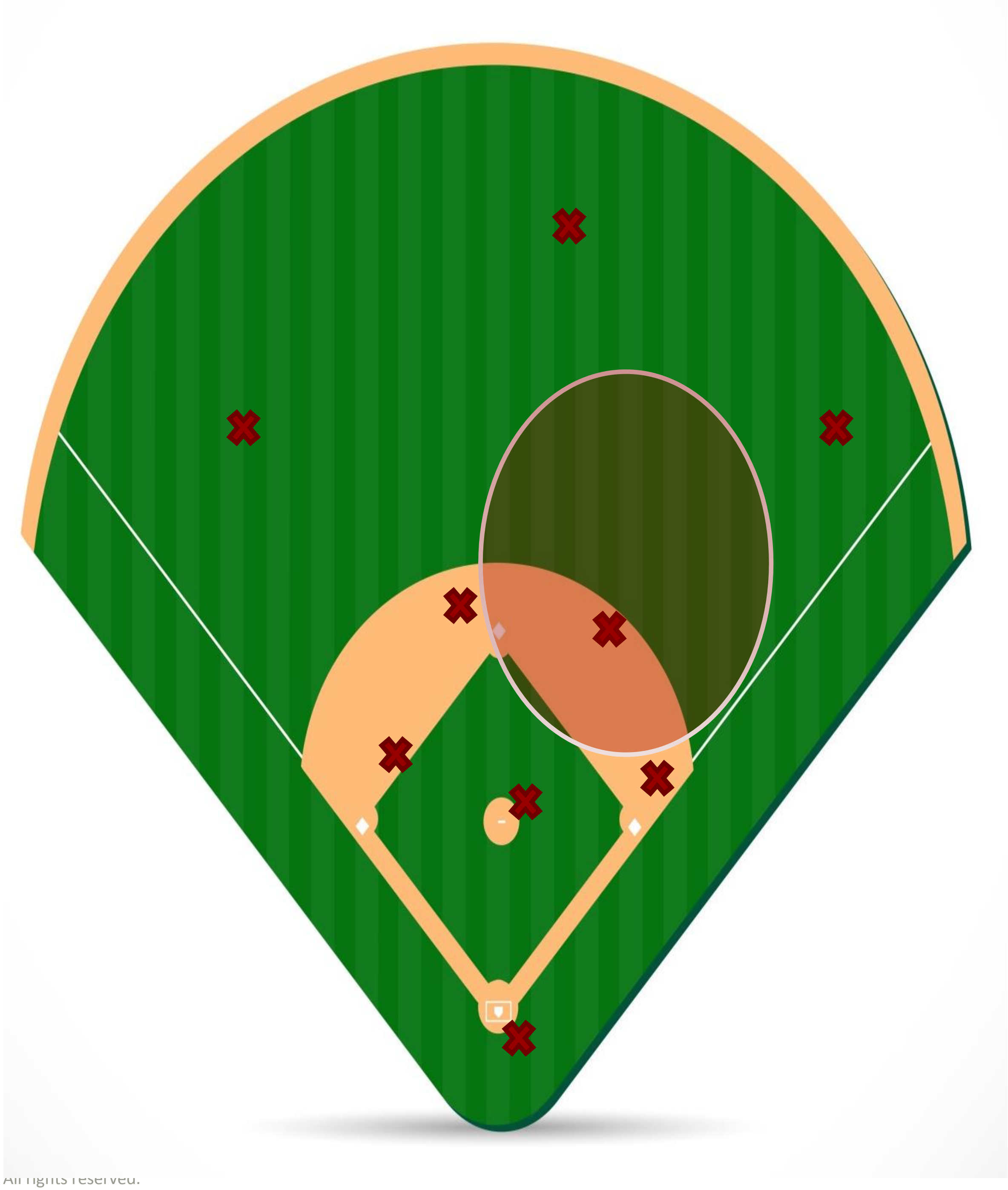
…it’s allowing us to

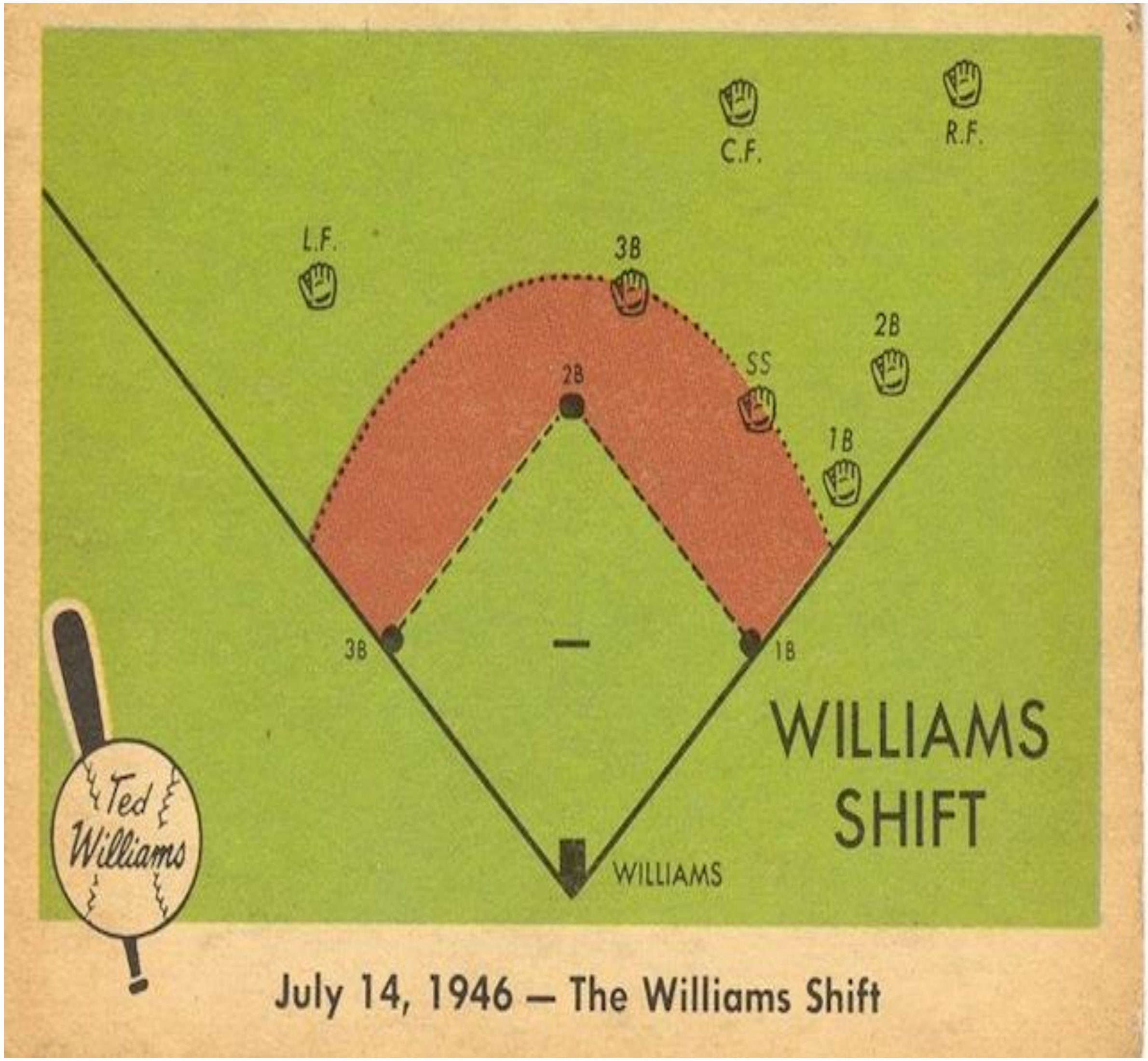
solve old problems…

...in new ways!

- Limited view of the customer
- Based on History
- No action taken

- **Comprehensive view**
- **Based predictive models**
- **Inspires ACTION!**



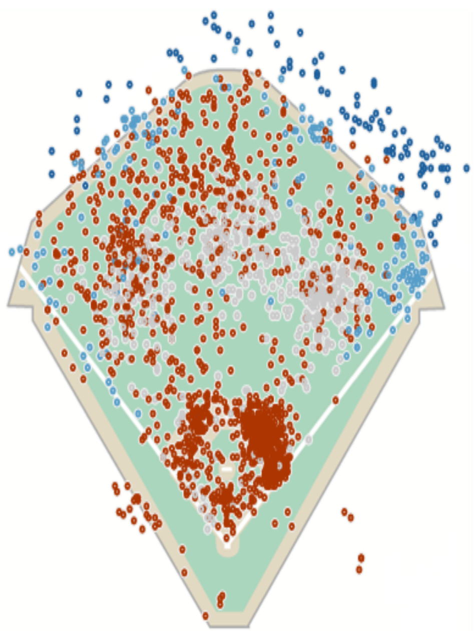


July 14, 1946 – The Williams Shift

Park Comparison | Batter Comparison | Pitcher Comparison | Player - Year to Year | Spray and Strike Zone Plot | Leaderboard

Date 4/10/2010

Batter Alex Gordon



Created by Bill Petti | Data and assistance from Jeff Zimmerman

Data through 10/29/2014

Stand (All)

Pitcher (All)

Throws (All)

Pitch Type (All)

Batted Ball Type (All)

RunValue (All)

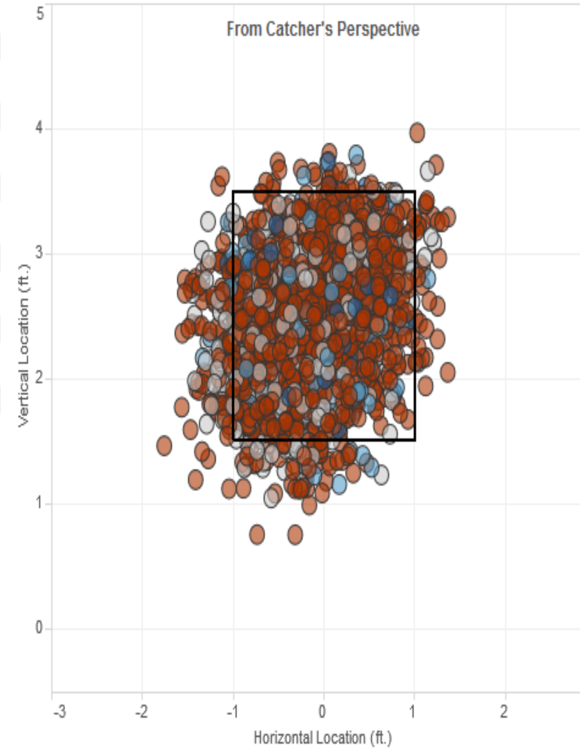
Vertical Location (ft.) -1.745 5.187

Horizontal Location (ft.) -4.69 2.435

Velocity 33.1 103.5

Angle -100.0 100.0

Distance (ft.) 0.0 516.1



# batted balls	RunValue	RunValue/100 batted balls	Avg. Distance (ft.)	Avg. Angle	Avg. Horizontal Location (ft.)	Avg. Vertical Location (ft.)	Avg. Velocity
2,123	133.5	6.3	193.6	7.4	0	2	87.9

+tableau

Are your connections
based on science?

...or art?

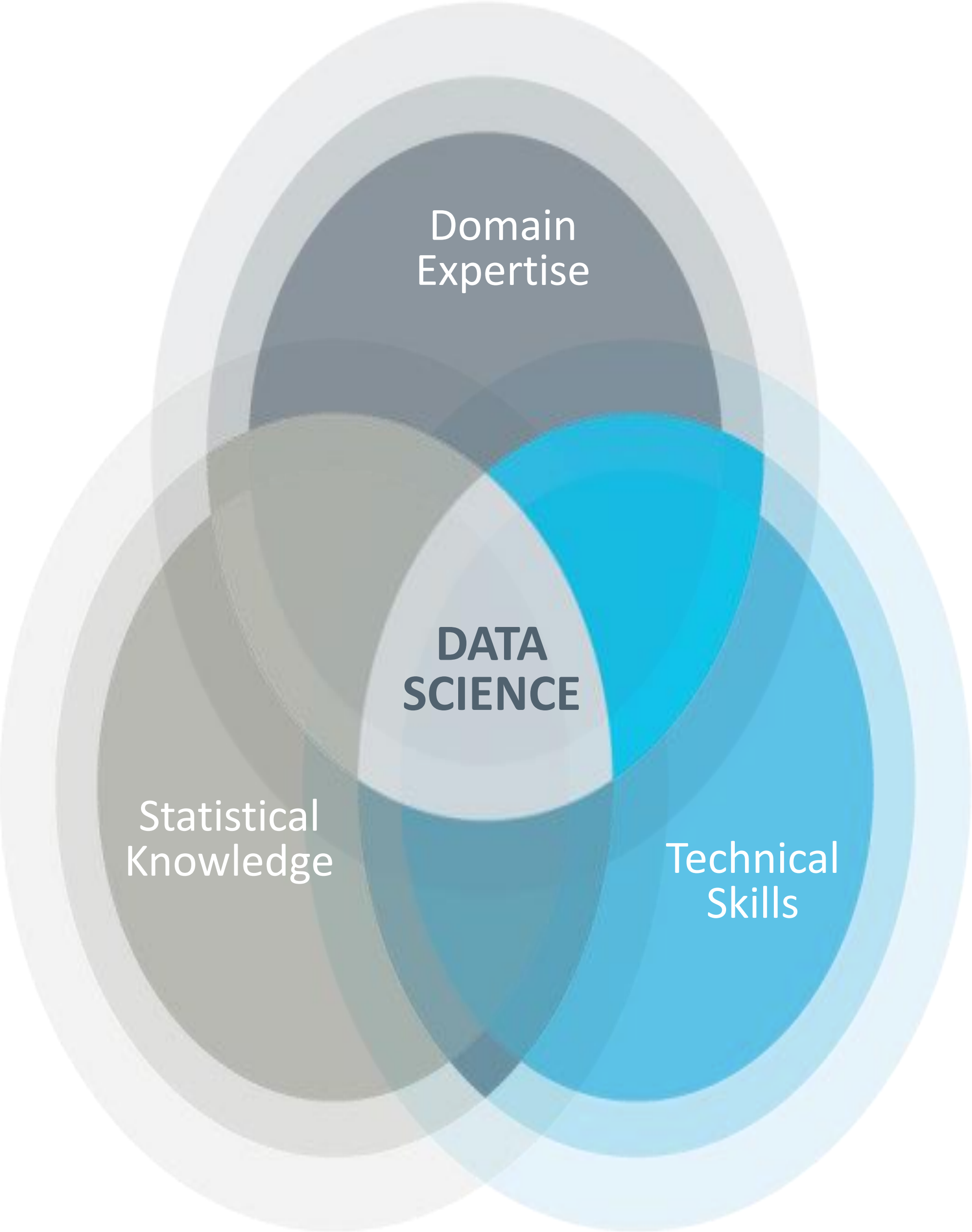
"Asset managers are ***woefully behind the curve*** *in using data and advanced analytics…"*

McKinsey & Company, *Blending Science with Art to Capture Growth in U.S. Retail Asset Management,* July 2014.

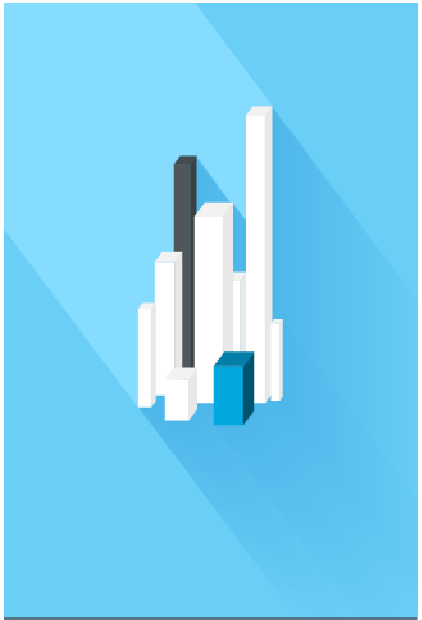
Data Science combines:

- statistics
- applied mathematics
- computer science
- engineering
- data visualization

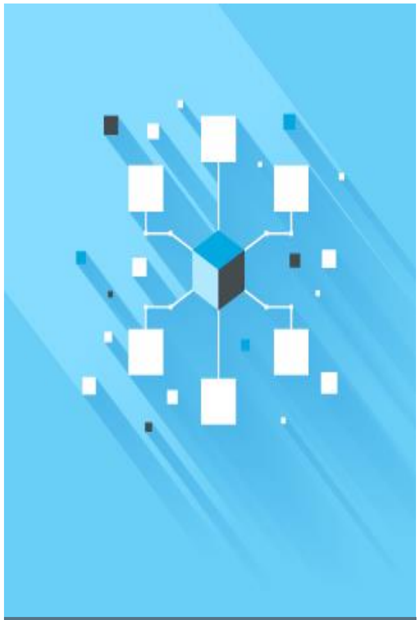
<u>and</u> deep industry expertise



Data Science Toolkit

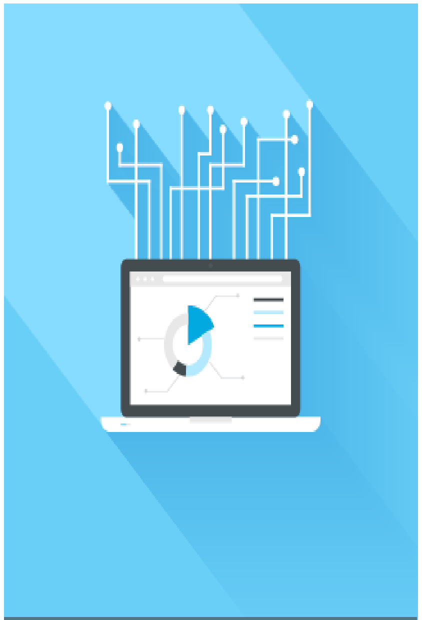


Benchmarking



Noise to Signal

Predictions



Recommendation Systems

Insight into Action

Benchmarking

Personalized Scorecards

Targeted Recommendations

Customer Journey Management

Product Optimization

"Asset managers who can quickly and effectively invest to build and deploy analytics will be armed with a

powerful competitive advantage…"

McKinsey & Company, *Blending Science with Art to Capture Growth in U.S. Retail Asset Management,* July 2014.

Thank you.

Jeff Carroll
jacarroll@dstrs.com

ebri.org
Employee Benefit
Research Institute

Panel 2: Measures for Assessing Retirement Income Adequacy

EBRI-ERF Policy Forum #75
Thursday, December 11, 2014

Wrap-up and key take-away points

EBRI-ERF Policy Forum #75
Thursday, December 11, 2014

Outcomes Oriented?

NEVIN E. ADAMS, JD

CHIEF OF COMMUNICATIONS, ASPPA/NAPA

ASPPA®

WORKING FOR AMERICA'S RETIREMENT

Does Plan Design Help Participants Make Better Decisions?

The PPA's Impact

- Automatic enrollment
- Contribution acceleration
- QDIAs

Automatic Adoptions

Do you use automatic enrollment?

	Plan Size									
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
Yes	40.8%	21.4%	24.2%	34.7%	45.5%	49.5%	55.5%	53.8%	64.5%	61.4%
No	52.9%	55.1%	63.6%	60.9%	52.1%	49.3%	44.0%	46.2%	34.9%	36.7%
Unsure	6.2%	23.5%	12.2%	4.4%	2.4%	1.1%	0.4%	0.0%	0.6%	1.9%

Source: 2013 PLANSPONSOR DC Survey

Why Not More?

Stepping Up?

Does your plan offer "auto escalation" (i.e., automatic deferral increases)?

Plan Size										
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
Yes	26.9%	10.6%	12.7%	19.1%	25.9%	35.2%	38.3%	44.3%	51.2%	54.2%
No	62.3%	51.1%	68.9%	72.8%	68.4%	60.1%	59.1%	54.2%	48.2%	42.9%
Unsure	10.8%	38.3%	18.4%	8.1%	5.7%	4.8%	2.6%	1.4%	0.6%	2.9%

Source: 2013 PLANSPONSOR DC Survey

A Prospective Perspective

When you implemented auto enrollment, which employee groups were included in the rollout?

	Plan Size									
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
New / future employees	87.9%	73.3%	81.5%	86.9%	89.9%	87.1%	89.2%	90.8%	97.2%	92.5%
Existing employees not enrolled in plan	26.8%	33.3%	31.1%	26.1%	26.4%	28.6%	25.4%	28.3%	19.6%	21.4%
Existing employees enrolled in plan but contributing below the auto-deferral rate (opt-out auto-boost)	11.0%	5.6%	6.3%	9.9%	13.5%	12.9%	12.2%	14.7%	10.3%	9.1%
Existing employees enrolled in plan but not invested in the QDIA (opt-out re-enrollment)	2.1%	2.2%	1.0%	1.8%	1.4%	3.9%	0.5%	3.8%	3.7%	3.2%
Other	6.2%	10.0%	7.7%	7.2%	5.6%	6.7%	5.3%	3.8%	3.7%	6.4%

Source: 2013 PLANSPONSOR DC Survey

Why Are We Leaving Them "Behind?"

What About Outcomes?

How confident are you that most of your organization's employees will achieve their retirement income goals by age 65?

	Plan Size									
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
Very confident	3.0%	7.0%	2.4%	1.4%	4.0%	1.6%	2.4%	4.3%	4.5%	2.5%
Confident	9.0%	8.9%	9.4%	8.8%	8.0%	9.5%	7.6%	9.0%	10.9%	11.8%
Somewhat confident	32.5%	25.7%	27.9%	32.6%	32.7%	31.6%	37.3%	36.8%	35.5%	38.4%
Only a little confident	28.6%	22.0%	27.9%	33.1%	28.9%	30.9%	29.5%	25.6%	30.0%	27.1%
Not at all confident	20.4%	24.3%	23.7%	15.0%	21.4%	23.0%	19.3%	22.6%	15.5%	11.8%
Unsure	6.4%	12.1%	8.8%	9.1%	5.0%	3.3%	3.9%	1.7%	3.6%	8.4%

Source: 2013 PLANSPONSOR DC Survey

How important is it to you/your organization that your plan provide retirement income solutions to participants?

Plan Size										
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
Very important	41.1%	40.6%	39.5%	43.6%	47.7%	46.7%	33.8%	40.5%	43.6%	34.7%
Important	36.8%	24.5%	38.8%	37.1%	36.4%	35.5%	43.0%	33.6%	34.5%	36.6%
Somewhat important	16.9%	23.1%	17.1%	15.0%	11.5%	14.8%	18.8%	20.3%	15.5%	22.3%
Not at all important	2.7%	4.2%	1.8%	1.7%	2.9%	2.3%	2.8%	3.9%	4.5%	3.5%
Unsure	2.4%	7.5%	2.8%	2.5%	1.5%	0.7%	1.5%	1.7%	1.8%	3.0%

Source: 2013 PLANSPONSOR DC Survey

Which of the following (if any) income-oriented products/services do you offer in your plan?

	Plan Size									
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
In-plan annuities/income products offering guarantees	8.6%	6.2%	6.7%	7.6%	7.9%	7.7%	11.6%	9.2%	15.7%	10.7%
In-plan annuities NOT offering guarantees	5.3%	1.9%	3.2%	5.3%	5.5%	6.4%	6.8%	8.3%	4.6%	7.6%
Other (i.e., non-annuity) in-plan income products NOT offering guarantees (i.e., managed payout funds, etc.)	5.9%	1.4%	4.6%	5.0%	4.5%	5.4%	6.8%	11.4%	8.3%	10.7%
Unsure what type of income product(s) are offered	24.0%	38.1%	33.6%	29.2%	27.9%	22.4%	14.2%	10.9%	7.4%	8.6%
NONE - we do not offer any income-oriented products/services	60.2%	52.9%	54.5%	55.8%	57.9%	62.5%	66.1%	67.2%	69.4%	70.1%

Source: 2013 PLANSPONSOR DC Survey

What Gets Measured…Matters

Which of the following measures do you use to gauge the success of your DC plan?

	Plan Size									
	Overall	<$1MM	$1MM-$5MM	$5MM-$10MM	$10MM-$25MM	$25MM-$50MM	$50MM-$200MM	$200MM-$500MM	$500MM-$1B	>$1B
Participation rate	68.4%	41.1%	58.0%	69.7%	74.7%	73.4%	77.3%	78.9%	81.0%	80.3%
Deferrals of various employee segments (e.g., highly vs. non-highly compensated)	34.1%	13.2%	23.3%	34.3%	42.2%	42.4%	41.3%	38.9%	42.3%	43.6%
% of participants saving to match	28.4%	16.5%	23.6%	23.1%	29.0%	28.5%	32.7%	38.0%	39.9%	45.6%
Projected monthly retirement income (i.e., $X per month in retirement)	4.4%	2.6%	2.9%	2.6%	3.1%	4.1%	5.9%	6.7%	9.2%	11.1%
Projected retirement income replacement	6.1%	3.5%	2.5%	3.0%	5.2%	6.3%	8.8%	9.6%	11.7%	18.4%
% of participants with "appropriate" Asset allocations (i.e., close to target-date fund glide path, etc.)	15.5%	6.5%	5.3%	10.0%	14.7%	18.2%	23.4%	27.5%	30.1%	36.7%
% of participants who increased deferral rates in the prior 12 months	9.1%	3.9%	6.3%	9.0%	10.8%	8.8%	11.6%	11.1%	15.3%	12.8%
% of participants using advice tools/seminars offered through the plan	10.7%	3.0%	4.6%	7.7%	11.8%	11.9%	14.6%	18.1%	22.7%	22.3%
Employee satisfaction surveys	20.1%	14.2%	19.4%	22.1%	23.1%	19.3%	20.2%	19.3%	20.2%	21.6%
External/competitive benchmarking of plan design	25.8%	6.7%	14.9%	23.0%	27.4%	30.9%	34.4%	37.1%	42.9%	45.2%
Have no formal plan success measures.	25.8%	50.1%	36.4%	24.6%	22.1%	19.3%	16.5%	15.5%	13.5%	14.1%

Source: 2013 PLANSPONSOR DC Survey

Can plan sponsors be “nudged” to make “better” choices?

SHOULD they?

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Measured Matters

EBRI-ERF Policy Forum #75
Thursday, December 11, 2014