Measured Matters

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

Wireless Password: innovation
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
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

- Tableau
- SAS
- Hadoop
- Teradata

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.
What is the Health Matters score?

**Define**

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

<table>
<thead>
<tr>
<th>Value of coaching opportunity</th>
<th>Targeted impact</th>
<th>Probability of success</th>
<th>Tobacco attribute score =</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quit tobacco $1,623</td>
<td>100% tobacco free</td>
<td>20%</td>
<td>325</td>
</tr>
</tbody>
</table>

**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

Tobacco attribute score 325

ER/IP diabetes attribute score 100

Brand to generic attribute score 200

Gaps in care attribute score 350

Total SMART score 975
How Health Matters creates value for Cigna customers

$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

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

Medical cost savings opportunity

Asthma
- One ER visit or inpatient stay
- Women’s plus size purchases
- Interest in dieting/weight loss

Diabetes
- Females > 42
- High-risk scores

Coronary artery disease
- Females > 42
- High-risk scores

Chronic kidney disease
- Diagnosis of CKD Stage 4
- No evidence of dialysis

$500 PDMPY
$780 PDMPY
$900 PDMPY
$2.4k PDMPY
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

Segment | Health-Behavior | Illness-Behaviors | Engagement
---|---|---|---
Healthy | Devices | Email | ✔
Chronic Illness | Apps | Phone | ✔

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

<table>
<thead>
<tr>
<th>Today</th>
<th>Working Toward</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care management reports for</td>
<td>New products and financial models to align</td>
</tr>
<tr>
<td>embedded nurses to identify</td>
<td>incentives HCP, customer and client</td>
</tr>
<tr>
<td>high-risk customers and close</td>
<td></td>
</tr>
<tr>
<td>claim-based care gaps</td>
<td></td>
</tr>
<tr>
<td>Performance management reports for practice administrators to identify areas of opportunity for affordability and quality improvement</td>
<td>Risk-adjusted episode of care arrangements</td>
</tr>
<tr>
<td>Contract negotiations for ACO performance for quality and cost outcomes and taking action on proactive Cigna data</td>
<td>EMR data driving improved stratification and quality assessment</td>
</tr>
<tr>
<td></td>
<td>Shared care plans between customer, Cigna nurses, and HCPs</td>
</tr>
</tbody>
</table>
Offered by: Connecticut General Life Insurance Company or Cigna Health and Life Insurance Company.

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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
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

<table>
<thead>
<tr>
<th></th>
<th>PREVENTION</th>
<th>INTERVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walgreens Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Plan Members</td>
<td>73%</td>
<td>19%</td>
</tr>
<tr>
<td>Claims Cost</td>
<td>$214.9m</td>
<td>$186.3m</td>
</tr>
<tr>
<td>Per Capita Cost</td>
<td>$1,431</td>
<td>$4,698</td>
</tr>
<tr>
<td>% of Total Cost</td>
<td>29%</td>
<td>25%</td>
</tr>
</tbody>
</table>

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
Record enrollment - over 140K completed, 98% online

Walgreens Enrollment by Metallic Level

- Silver: 43%
- Gold: 12%
- Platinum: 9%
- Bronze: 26%
- Bronze Plus: 10%

Primary Reason for Choosing 2014 Medical Plan Level

- 32% Best overall pricing (OOP + Premium)
- 25% Wanted plan as close to current plan as possible
- 19% Best level of medical coverage for me
- 8% Wanted lowest possible premium
- 8% Wanted lowest possible out-of-pocket costs
- 8% Other

Record enrollment - over 140K completed, 98% online

Proprietary & Confidential | Annual Enrollment Results 2014
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 copay up 48% versus last year
2013 Healthcare Clinic Population Overview – Leveraging Store/Onsite Clinics to Lower Costs

<table>
<thead>
<tr>
<th>Employees in a 10-mile radius of a Healthcare Clinic</th>
<th>Number of employees who are enrolled</th>
<th>Percentage of employees who are enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>98,757</td>
<td>42,436</td>
<td>43.0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Enrolled members</th>
<th>Clinic utilization (n)</th>
<th>Clinic utilization (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee</td>
<td>42,436</td>
<td>14,278</td>
<td>33.6%</td>
</tr>
<tr>
<td>Dependent</td>
<td>37,797</td>
<td>8,643</td>
<td>22.9%</td>
</tr>
<tr>
<td>Total</td>
<td>80,233</td>
<td>22,921</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

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
Number of Healthcare Clinic visits by team members increased 40%

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

2011 2012 2013
16,311 18,599 22,921

2011 2012 2013
$836,000 $874,000 $1,300,700

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

<table>
<thead>
<tr>
<th>Engage ment</th>
<th>2013 ($150 Gift card)</th>
<th>2014 ($150 in Balance Rewards)</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period 1 (January 1-March 31)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• # of participants</td>
<td>18,190</td>
<td>30,556</td>
<td>68%</td>
</tr>
<tr>
<td>• Total dollars earned</td>
<td>$717,750</td>
<td>$1,500,000</td>
<td></td>
</tr>
<tr>
<td>Period 2 (April 1-June 30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• # of participants</td>
<td>6,214</td>
<td>36,145</td>
<td>480%</td>
</tr>
<tr>
<td>• Total dollars earned</td>
<td>$260,850</td>
<td>$1,800,000</td>
<td></td>
</tr>
</tbody>
</table>
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Panel 2: Measures for Assessing Retirement Income Adequacy

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

December 2014
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

Retirement plan participation rates¹

Percent of households with account

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

1936-1944
1945-1953
1954-1962
1963-1971

Birth Cohort

Falling Absolute Coverage

Falling Longevity and (Nominal) Income Coverage


¹ “Any Plan” represents households that report owning a DB Plan, a DC Plan, or an Individual Retirement Account.
Income sources at retirement:
The stool’s legs are of vastly different length

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

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.

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).


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?

\[ y = 0.071x^2 - 1.681x + 21.528 \]

\[ R^2 = 0.55 \]

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

Components of household balance sheet

Assets: Primary housing value
Superannuation
Other assets

Liabilities: Primary housing loan
Other liabilities
Net worth

US Housing Share (Right Axis)
AUS Housing Share (Right Axis)

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?

- Simple, effective & reputation: 46%
- Guarantees & protection: 24%
- Control, estate planning & recommendation: 12%
- Cost & return: 11%
- Linked to other accounts: 4%

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?
WORKFORCE MANAGEMENT ISSUES RELATED TO RETIREMENT PLANS

DECEMBER 11, 2014

Arthur L. Noonan
Senior Partner
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

- Delayed Retirements
- Early/Mid-Career Turnover
- Intangible Damage
- Legal Risk
- High Potential/Top Performer Loss
- Higher Health Care Cost
- Higher Labor Cost

Measurement is Power

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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

<table>
<thead>
<tr>
<th>Career Level</th>
<th>Hires</th>
<th>Actives</th>
<th>Laterals</th>
<th>Total Exits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 8</td>
<td>8.0%</td>
<td>3.1%</td>
<td>4.0%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Level 7</td>
<td>4.6%</td>
<td>3.3%</td>
<td>3.1%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Level 6</td>
<td>3.3%</td>
<td>3.3%</td>
<td>4.4%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Level 5</td>
<td>3.2%</td>
<td>3.4%</td>
<td>4.8%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Level 4</td>
<td>3.8%</td>
<td>3.6%</td>
<td>6.7%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Level 3</td>
<td>7.4%</td>
<td>7.3%</td>
<td>5.3%</td>
<td>11.1%</td>
</tr>
<tr>
<td>Level 2</td>
<td>14.9%</td>
<td>15.8%</td>
<td>5.1%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Level 1</td>
<td>18.5%</td>
<td>15.5%</td>
<td>4.4%</td>
<td>15.1%</td>
</tr>
<tr>
<td>All levels</td>
<td>10.5%</td>
<td>11.0%</td>
<td>5.3%</td>
<td>12.7%</td>
</tr>
</tbody>
</table>

“Build” Organization: Ratio of new hires to promotees drops below 1

Career “choke points” have materialized at these levels

Velocity of Talent Movement is low beyond the professional level
• 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

While access to company-sponsored medical coverage is the single most important factor influencing the choice to retire ….

… Career considerations – upward mobility, level, span of influence – also are driving that choice

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.

<table>
<thead>
<tr>
<th>Percentage difference in probability of early retirement</th>
<th>Less likely to retire</th>
<th>More likely to retire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-60%</td>
<td>-40%</td>
</tr>
<tr>
<td>Training: General Skills</td>
<td>-10%</td>
<td></td>
</tr>
<tr>
<td>Training: Firm-specific Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Promotion Rate in Group (+10%)</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Higher Turnover Rate in Group (+2%)</td>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>More Tenured Group (+2.5 years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highly Rated Supervisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More Tenured Supervisor</td>
<td>-2%</td>
<td></td>
</tr>
<tr>
<td>Supervisor with Higher Span of Control (31+)</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Higher Total Compensation (+$8500)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Base Pay Growth (+3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Total Compensation Growth (+6%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Overtime Pay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher Overtime Pay (+$7500)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Education Allowance</td>
<td>-51%</td>
<td></td>
</tr>
<tr>
<td>Education Allowance (+$10,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Home Loan</td>
<td>-30%</td>
<td></td>
</tr>
<tr>
<td>Received Higher “Benefits Pay” (+$2000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received Relocation Allowance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
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

Realistically, at what age do you expect to retire? How old were you when you retired?

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Workers (n=1,000)</th>
<th>Retirees (n=501)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 55</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>55-59</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>66-69</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>70 or older</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Never retire</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Never worked</td>
<td>9%</td>
<td>10%</td>
</tr>
<tr>
<td>Don’t know/Refused</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Median Workers: 65
Median Retirees: 62

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

© 2014, Mercer
Improve Retirement Income Adequacy through a Behavioral Economics Lens

December 11, 2014

EBRI – ERF Policy Forum
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

Sibson Consulting
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

<table>
<thead>
<tr>
<th>Current Year Contribution Rate</th>
<th>New Year Default Contribution Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%, 1% or 2%</td>
<td>3%</td>
</tr>
<tr>
<td>3% - 5%</td>
<td>4% - 6%</td>
</tr>
<tr>
<td>6% +</td>
<td>No Change</td>
</tr>
</tbody>
</table>

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?

<table>
<thead>
<tr>
<th></th>
<th>Manager A</th>
<th>Manager B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets Under Management</td>
<td>$20 Billion</td>
<td>$7.2 Million</td>
</tr>
<tr>
<td>Clients</td>
<td>Over 100, including sophisticated investors and well-known families</td>
<td>11 Doctors</td>
</tr>
<tr>
<td>Results</td>
<td>Average annual 10 years of 25%; volatility 2% / year</td>
<td>Average annual 6 years of 25%; volatility 14% / year</td>
</tr>
<tr>
<td>Portfolio</td>
<td>Basket of S&amp;P 100 stocks with options strategy</td>
<td>30–40 stocks</td>
</tr>
<tr>
<td>Offices</td>
<td>New York and London</td>
<td>Omaha, Nebraska</td>
</tr>
</tbody>
</table>
HERDING BIAS: Gravitating to an investment opportunity based principally on the fact that many others are doing so.

Manager A
Bernie Madoff, 2001

Manager B
Warren Buffett, 1962
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.”

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!

<table>
<thead>
<tr>
<th>Mental Shortcuts as BARRIERS TO CHANGE</th>
<th>Examples with Retirement Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity Aversion and Clue Seeking Bias</td>
<td>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.</td>
</tr>
<tr>
<td>Hyperbolic Discounting</td>
<td>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?</td>
</tr>
<tr>
<td>Sentinel Event Bias</td>
<td>My former boss chose the annuity at retirement and died young. I won’t make the same mistake—give me the lump sum!</td>
</tr>
</tbody>
</table>
### Behavioral Biases Can Be Tapped to Improve Choice-Making

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

<table>
<thead>
<tr>
<th>Shoppers who stopped</th>
<th>6 kinds of jams</th>
<th>24 kinds of jams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40%</td>
<td>60%</td>
</tr>
</tbody>
</table>

### Complexity Aversion is Paralyzing

<table>
<thead>
<tr>
<th>Shoppers who stopped</th>
<th>6 kinds of jams</th>
<th>24 kinds of jams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoppers who bought jam</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>3%</td>
</tr>
</tbody>
</table>


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

<table>
<thead>
<tr>
<th>Typical Retirement Plan Election Language</th>
<th>Simplified Retirement Election Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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.</td>
<td>Choose one of the following monthly income streams for your retirement benefit:</td>
</tr>
<tr>
<td>• Single Life Annuity: Monthly Benefit = $1,000</td>
<td>□ $667 monthly income while you and your spouse are both living.</td>
</tr>
<tr>
<td>• Joint and Survivor Annuity = $667, reducing to a $500 survivor benefit</td>
<td>$500 monthly income for your spouse after you pass away.</td>
</tr>
<tr>
<td></td>
<td>□ $1,000 monthly income while you and your spouse are both living.</td>
</tr>
<tr>
<td></td>
<td>$0 monthly income for your spouse after you pass away.</td>
</tr>
<tr>
<td></td>
<td>Under this option, your spouse must sign a notarized consent form.</td>
</tr>
</tbody>
</table>
Framing to Increase Savings Rates

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

<table>
<thead>
<tr>
<th>Employee Deferral</th>
<th>Company Match</th>
<th>Total Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>2%</td>
<td>1.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>4%</td>
<td>2.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>6%</td>
<td>3.0%</td>
<td>9.0%</td>
</tr>
<tr>
<td>8%</td>
<td>3.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>10%</td>
<td>3.0%</td>
<td>13.0%</td>
</tr>
<tr>
<td>12%</td>
<td>3.0%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

BEHAVIORAL ECONOMIC SOLUTION

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

<table>
<thead>
<tr>
<th>Employee Savings Rate</th>
<th>Employer Contribution</th>
<th>Total Contribution</th>
<th>Lost Employer Match</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
<td>3%</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td>10%</td>
<td>3%</td>
<td>13%</td>
<td>0%</td>
</tr>
<tr>
<td>8%</td>
<td>3%</td>
<td>11%</td>
<td>0%</td>
</tr>
<tr>
<td>6%</td>
<td>3%</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>4%</td>
<td>2%</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>2%</td>
<td>1%</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
</tr>
</tbody>
</table>

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

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

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?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficient Information</td>
<td>43%</td>
</tr>
<tr>
<td>Clue Seeing Bias</td>
<td>9%</td>
</tr>
<tr>
<td>Deliberate Choice</td>
<td>24%</td>
</tr>
<tr>
<td>Procrastination</td>
<td>24%</td>
</tr>
</tbody>
</table>

Do people regret the plan choice they made?

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active choosers</td>
<td>16%</td>
</tr>
<tr>
<td>Defaulting people</td>
<td>35%</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Save 9% of pay</th>
<th>Save 6% of pay</th>
<th>Save 2% of pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eat steak and lobster; live the good life!</td>
<td>Eat hamburger.</td>
<td>Eat processed bologna for the rest of your life.</td>
</tr>
<tr>
<td>Travel to exotic locations; live the good life!</td>
<td>Travel to a nearby resort.</td>
<td>Vacation at your local community center.</td>
</tr>
</tbody>
</table>
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**
- **YIELD SEEKING**

**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

**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

- **Familiarity Bias:**
  - Nudge → Reframe the Information

- **Comparative Competence Bias:**
  - Nudge → Use Defaults

- **Choice Supportive Bias:**
  - Nudge → Show differences in results in different historical periods

- **Complexity Bias:**
  - Nudge → Convey Peer Group Norms

**Time Allocated to Planning**
- Little Time: 5 to 10 Minutes
- Moderate Time: 30 to 60 minutes
- Significant Time

**Subject Matter Expertise**
- Expert
- Experienced
- Inexperienced

**Time: Allocation to Planning**
- Little Time:
  - Experienced Investor
  - Little Time, Inexperienced Investor
- Moderate Time:
  - Experienced Investor
- Significant Time:
  - Little Time: 5 to 10 Minutes
  - Moderate Time: 30 to 60 minutes
  - Significant Time

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
Motivations, Emotions and Engagement Triggers

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

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

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

Defer income into 401(k) plan
Earn matching contribution
Commit to Increase Savings Rate in Future
Increase Employee Deferral and Matching Contribution
New Savings Behavior

Maintain Savings (path to readiness)
Relapse to Current Spending (forfeit extra match)

Loss Aversion

Gains, Losses, and Utility

Source: Prospect Theory; Daniel Kahneman
How to Influence Participant Behavior Change to Improve Retirement Readiness & Financial Wellbeing

<table>
<thead>
<tr>
<th>Establish Personal Relevance</th>
<th>Trigger Emotional Reactions</th>
<th>Define Clear Choices and Convey Value</th>
<th>Ask a Small Related Request</th>
<th>Channel to the Best Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish personal relevance by using familiar references and consistent branding. Nudge formal and informal leaders who are admired and liked.</td>
<td>Trigger emotional responses (hope, fear, excitement, adventure, love, greed, caring).</td>
<td>Define clear choices about trade-offs between financial options and quality of life. Convey value in making smart choices: ✓ live well ✓ care for others</td>
<td>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</td>
<td>Channel employees to the best high quality / easy-to-use resource available: ✓ retirement calculators ✓ pre-retirement counselors ✓ financial advisors</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Performance History (50%)</th>
<th>Style Consistency &amp; Management (50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trustee 1</td>
<td>Trustee 2</td>
</tr>
<tr>
<td>Fund X</td>
<td>7</td>
</tr>
<tr>
<td>Fund Y</td>
<td>8</td>
</tr>
</tbody>
</table>

**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”

<table>
<thead>
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<th>Performance History (50%)</th>
<th>Style Consistency &amp; Management (50%)</th>
</tr>
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<td>Fund X</td>
<td>7</td>
</tr>
<tr>
<td>Fund Y</td>
<td>8</td>
</tr>
</tbody>
</table>

**Fund Y wins the majority of the contests.**

<table>
<thead>
<tr>
<th>Trustee 1</th>
<th>Trustee 2</th>
<th>Trustee 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perf (50%)</td>
<td>Mgmt (50%)</td>
<td>Perf (50%)</td>
</tr>
<tr>
<td>Fund A</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Fund B</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

**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
Helping customers leverage data to make informed business decisions.

Applied Analytics Group
How valuable are traditional success measures?
- Limited view of the customer
- Based on historic view
- No action taken
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!
<table>
<thead>
<tr>
<th>Stand</th>
<th>Pitcher</th>
<th>Throws</th>
<th>Pitch Type</th>
<th>Batted Ball Type</th>
<th>RunValue</th>
<th>Vertical Location (ft)</th>
<th>Horizontal Location (ft)</th>
<th>Velocity</th>
<th>Angle</th>
<th>Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(AJ)</td>
<td>(AJ)</td>
<td>(AJ)</td>
<td>(AJ)</td>
<td>(AJ)</td>
<td>(AJ)</td>
<td>-1.745</td>
<td>5.187</td>
<td>30.1</td>
<td>103.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Data through 10/29/2014

<table>
<thead>
<tr>
<th># batted balls</th>
<th>RunValue</th>
<th>RunValue/100 batted balls</th>
<th>Avg. Distance (ft.)</th>
<th>Avg. Angle</th>
<th>Avg. Horizontal Location (ft.)</th>
<th>Avg. Vertical Location (ft.)</th>
<th>Avg. Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.123</td>
<td>133.5</td>
<td>0.3</td>
<td>193.0</td>
<td>7.4</td>
<td>0</td>
<td>2</td>
<td>07.9</td>
</tr>
</tbody>
</table>
Are your connections based on science?
...or art?
“Asset managers are woefully behind the curve in using data and advanced analytics…”
Data Science combines:

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

and 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...”
Thank you.

Jeff Carroll
jacarroll@dstrs.com
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
Does Plan Design Help Participants Make Better Decisions?
The PPA’s Impact

- Automatic enrollment
- Contribution acceleration
- QDIAs
### Automatic Adoptions

**Do you use automatic enrollment?**

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

Source: 2013 PLANSPOONOR DC Survey
Why Not More?
Stepping Up?

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

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

Source: 2013 PLANSponsor DC Survey
### When you implemented auto enrollment, which employee groups were included in the rollout?

<table>
<thead>
<tr>
<th>Plan Size</th>
<th>Overall</th>
<th>&lt;$1MM</th>
<th>$1MM-$5MM</th>
<th>$5MM-$10MM</th>
<th>$10MM-$25MM</th>
<th>$25MM-$50MM</th>
<th>$50MM-$200MM</th>
<th>$200MM-$500MM</th>
<th>$500MM-$1B</th>
<th>&gt;$1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>New / future employees</td>
<td>87.9%</td>
<td>73.3%</td>
<td>81.5%</td>
<td>86.9%</td>
<td>89.9%</td>
<td>87.1%</td>
<td>89.2%</td>
<td>90.8%</td>
<td>97.2%</td>
<td>92.5%</td>
</tr>
<tr>
<td>Existing employees not enrolled in plan</td>
<td>26.8%</td>
<td>33.3%</td>
<td>31.1%</td>
<td>28.1%</td>
<td>26.4%</td>
<td>28.6%</td>
<td>25.4%</td>
<td>28.3%</td>
<td>19.6%</td>
<td>21.4%</td>
</tr>
<tr>
<td>Existing employees enrolled in plan but contributing below the auto-deferral rate (opt-out auto-boost)</td>
<td>11.0%</td>
<td>5.6%</td>
<td>6.3%</td>
<td>9.9%</td>
<td>13.5%</td>
<td>12.9%</td>
<td>12.2%</td>
<td>14.7%</td>
<td>10.3%</td>
<td>9.1%</td>
</tr>
<tr>
<td>Existing employees enrolled in plan but not invested in the QDIA (opt-out re-enrollment)</td>
<td>2.1%</td>
<td>2.2%</td>
<td>1.0%</td>
<td>1.8%</td>
<td>1.4%</td>
<td>3.9%</td>
<td>0.5%</td>
<td>3.8%</td>
<td>3.7%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Other</td>
<td>6.2%</td>
<td>10.0%</td>
<td>7.7%</td>
<td>7.2%</td>
<td>5.6%</td>
<td>6.7%</td>
<td>5.3%</td>
<td>3.8%</td>
<td>3.7%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>

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?

<table>
<thead>
<tr>
<th>Plan Size</th>
<th>Overall</th>
<th>&lt;$1MM</th>
<th>$1MM-$5MM</th>
<th>$5MM-$10MM</th>
<th>$10MM-$25MM</th>
<th>$25MM-$50MM</th>
<th>$50MM-$200MM</th>
<th>$200MM-$500MM</th>
<th>$500MM-$1B</th>
<th>&gt;$1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very confident</td>
<td>3.0%</td>
<td>7.0%</td>
<td>2.4%</td>
<td>1.4%</td>
<td>4.0%</td>
<td>1.6%</td>
<td>2.4%</td>
<td>4.3%</td>
<td>4.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Confident</td>
<td>9.0%</td>
<td>8.9%</td>
<td>9.4%</td>
<td>8.8%</td>
<td>8.0%</td>
<td>9.5%</td>
<td>7.6%</td>
<td>9.0%</td>
<td>10.9%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Somewhat confident</td>
<td>32.5%</td>
<td>25.7%</td>
<td>27.9%</td>
<td>32.6%</td>
<td>32.7%</td>
<td>31.6%</td>
<td>37.3%</td>
<td>36.8%</td>
<td>35.5%</td>
<td>38.4%</td>
</tr>
<tr>
<td>Only a little confident</td>
<td>28.6%</td>
<td>22.0%</td>
<td>27.9%</td>
<td>33.1%</td>
<td>28.9%</td>
<td>30.9%</td>
<td>29.5%</td>
<td>25.6%</td>
<td>30.0%</td>
<td>27.1%</td>
</tr>
<tr>
<td>Not at all confident</td>
<td>20.4%</td>
<td>24.3%</td>
<td>23.7%</td>
<td>15.0%</td>
<td>21.4%</td>
<td>23.0%</td>
<td>19.3%</td>
<td>22.6%</td>
<td>15.5%</td>
<td>11.8%</td>
</tr>
<tr>
<td>Unsure</td>
<td>6.4%</td>
<td>12.1%</td>
<td>8.8%</td>
<td>9.1%</td>
<td>5.0%</td>
<td>3.3%</td>
<td>3.9%</td>
<td>1.7%</td>
<td>3.6%</td>
<td>8.4%</td>
</tr>
</tbody>
</table>
How important is it to you/your organization that your plan provide retirement income solutions to participants?

<table>
<thead>
<tr>
<th>Plan Size</th>
<th>Overall</th>
<th>&lt;$1MM</th>
<th>$1MM-$5MM</th>
<th>$5MM-$10MM</th>
<th>$10MM-$25MM</th>
<th>$25MM-$50MM</th>
<th>$50MM-$200MM</th>
<th>$200MM-$500MM</th>
<th>&gt;$500MM-$1B</th>
<th>&gt;$1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very important</td>
<td>41.1%</td>
<td>40.6%</td>
<td>39.5%</td>
<td>43.6%</td>
<td>47.7%</td>
<td>46.7%</td>
<td>33.8%</td>
<td>40.5%</td>
<td>43.6%</td>
<td>34.7%</td>
</tr>
<tr>
<td>Important</td>
<td>38.8%</td>
<td>24.5%</td>
<td>38.8%</td>
<td>37.1%</td>
<td>36.4%</td>
<td>35.5%</td>
<td>43.0%</td>
<td>33.6%</td>
<td>34.5%</td>
<td>36.6%</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>16.9%</td>
<td>23.1%</td>
<td>17.1%</td>
<td>15.0%</td>
<td>11.5%</td>
<td>14.8%</td>
<td>18.8%</td>
<td>20.3%</td>
<td>15.5%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Not at all important</td>
<td>2.7%</td>
<td>4.2%</td>
<td>1.5%</td>
<td>1.7%</td>
<td>2.9%</td>
<td>2.3%</td>
<td>2.8%</td>
<td>3.9%</td>
<td>4.5%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Unsure</td>
<td>2.4%</td>
<td>7.5%</td>
<td>2.6%</td>
<td>2.5%</td>
<td>1.5%</td>
<td>0.7%</td>
<td>1.5%</td>
<td>1.7%</td>
<td>1.6%</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

Source: 2013 PLANS PONDER DC Survey
Which of the following (if any) income-oriented products/services do you offer in your plan?

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

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?

<table>
<thead>
<tr>
<th>Plan Size</th>
<th>Overall</th>
<th>&lt;$1MM</th>
<th>$1MM-$5MM</th>
<th>$5MM-$10MM</th>
<th>$10MM-$25MM</th>
<th>$25MM-$50MM</th>
<th>$50MM-$200MM</th>
<th>$200MM-$500MM</th>
<th>&gt;$500MM-$1B</th>
<th>&gt;$1B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation rate</td>
<td>68.4%</td>
<td>41.1%</td>
<td>58.0%</td>
<td>69.7%</td>
<td>74.7%</td>
<td>73.4%</td>
<td>77.3%</td>
<td>78.5%</td>
<td>81.0%</td>
<td>80.3%</td>
</tr>
<tr>
<td>Deferrals various</td>
<td>34.1%</td>
<td>13.2%</td>
<td>23.3%</td>
<td>34.3%</td>
<td>42.2%</td>
<td>42.4%</td>
<td>41.3%</td>
<td>36.9%</td>
<td>42.3%</td>
<td>43.6%</td>
</tr>
<tr>
<td>Segments (e.g.,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>highly vs. non-highly compensated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of participants</td>
<td>28.4%</td>
<td>16.5%</td>
<td>23.6%</td>
<td>23.1%</td>
<td>29.0%</td>
<td>28.5%</td>
<td>32.7%</td>
<td>38.0%</td>
<td>39.9%</td>
<td>45.6%</td>
</tr>
<tr>
<td>saving to match</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected monthly</td>
<td>4.4%</td>
<td>2.6%</td>
<td>2.9%</td>
<td>2.6%</td>
<td>3.1%</td>
<td>4.1%</td>
<td>5.9%</td>
<td>6.7%</td>
<td>9.2%</td>
<td>11.1%</td>
</tr>
<tr>
<td>retirement income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i.e., $X per month in retirement)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected</td>
<td>6.1%</td>
<td>3.5%</td>
<td>2.5%</td>
<td>3.0%</td>
<td>5.2%</td>
<td>6.3%</td>
<td>8.6%</td>
<td>9.6%</td>
<td>11.7%</td>
<td>18.4%</td>
</tr>
<tr>
<td>retirement income</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>replacement</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of participants</td>
<td>15.5%</td>
<td>6.5%</td>
<td>5.3%</td>
<td>10.0%</td>
<td>14.7%</td>
<td>18.2%</td>
<td>23.4%</td>
<td>27.5%</td>
<td>30.1%</td>
<td>36.7%</td>
</tr>
<tr>
<td>with &quot;appropriate&quot;</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Asset allocations (i.e., close to target-date fund glide path, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of participants</td>
<td>9.1%</td>
<td>3.9%</td>
<td>6.3%</td>
<td>9.0%</td>
<td>10.8%</td>
<td>8.8%</td>
<td>11.6%</td>
<td>11.1%</td>
<td>15.3%</td>
<td>12.8%</td>
</tr>
<tr>
<td>who increased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>deferral rates in</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>the prior 12</td>
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<tr>
<td>months</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of participants</td>
<td>10.7%</td>
<td>3.0%</td>
<td>4.6%</td>
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Source: 2013 PLANSPONSOR DC Survey
Can plan sponsors be “nudged” to make “better” choices?
SHOULD they?
Measured Matters

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