2035 Vision: Investing in the Future

July 18, 2016
2035 Vision: Investing in the Future

Today’s Objective

• Engage in an educational dialogue on very long-term considerations: how will we invest in the year 2035?

Key Topics

• Current state
• Future state – Panelist presentations
  • Emerging financial technologies impact on investing
  • Impact of “Big Data” and long-term risk factors
  • Perennial importance of Governance
• Panelist and Board Dialogue on key questions
Current State | Market Environment

- **Liquidity and Income**: Increasing challenge to manage risk and pay benefits in all market conditions
- **7.5% Return Target**: Very challenging in low interest rate environment
- **Cash-flow Gap**: Increasing annual cash shortfall = increasing vulnerability to market downturns
- **Unique Operating Environment**: Investment and Actuarial Divisions operating inside a Public Agency
- **Cost and Transparency**: Continual focus
Current State | Business Model

- **$295B Portfolio**: Stocks, bonds, real estate, private equity, and other public and private investment vehicles
- Public Assets *internally managed*, private assets *externally managed*
- Risk is a key driver of portfolio and organization
- Asset Allocation decisions made in collaboration with actuaries/liabilities
- High degree of oversight and transparency
Current State | Talent Management

378 Investment Office Staff

- Positions are demanding and competitive; but can have reasonable hours/ balance/ compensation

Singular location

- Sacramento, CA
- No satellite offices, no telecommuting, no remote staff
Current State | Technology

Multiple leading-edge platforms/ systems consistent with mid-size Asset Manager
- Charles River (CRIMS) – Equity portfolio management
- BlackRock Aladdin – Fixed income, derivatives
- Private Equity Accounting and Reporting Solution (PEARS)
- Automated Real Estate Investment System (AREIS)
- Artemis – Asset Allocation and Transition Software
- State Street Bank - Custody/Portfolio Accounting/Performance
2035 Vision: Investing in the Future

Jesse McWaters
Project Lead – Disruptive Innovation in Financial Services
World Economic Forum

- Leads the World Economic Forum’s work on innovation in financial services
  - Initiative that seeks to understand how new technologies and innovative new entrants are transforming the competitive dynamics of the industry
- Manages two of the Forum’s Global Agenda Councils
  - Focus on Insurance and Asset Management and the Global financial system
- Contributed to the organization’s work efforts that explore sources of macroeconomic instability
  - Co-authored “Euro, Dollar, Yuan Uncertainties - Scenarios on the Future of the International Monetary System”
- Former financial services consultant with Deloitte
  - Served as Head of Research for Deloitte’s Future of Canada Institute
The Future of Financial Services
How disruptive innovations are reshaping the way financial services are structured, provisioned and consumed

Prepared in collaboration with Deloitte
In 2014...

BANKS vs. FINTECH?

NO CONTEST, BANKS WIN
In 2015...

WALL STREET’S SCRAMBLING TO CATCH UP WITH SILICON VALLEY
Lending Club rapid expansion plans undimmed
Peer-to-Peer Lending Takes Off in China

Beyond Bitcoin: How The Blockchain Could Disrupt Our Financial System

‘Robo’ Advice Strikes a Chord With Consumers: Study
Disruption on Deck for Retail Financial Services

APPLE PAY RECRUITS DOZENS OF NEW BANKS AND STORES

The London Fintech Boom — TransferWise And Others Hit Record Numbers

TECH UPEENDED BANKS AND STOCK TRADING. INSURANCE IS NEXT

Masters joins cryptocurrency start-up

Human wealth advisers are going out of fashion
In 2016...

UBS CIO: Blockchain Technology Can Massively Simplify Banking

The fintech revolution

Goldman joins online lenders’ club

Industry Convergence In Financial Services Is Accelerating

Equity crowdfunding thrives despite high risks

Can Fintech Fix Financial Services?

Wall Street giving billions to fintech start-ups

Crowdfunders seek revisions to FCA rules
Over the last three years the World Economic Forum has been deeply engaged with the drivers of the fintech revolution.
We have developed a consolidated framework for disruptive innovation in financial services.
Fintech Today: Four Observations
Innovation in financial services is deliberate and predictable...

...it occurs where customer friction meets large profit pools
Fintech is having the greatest impact where business models are...

...platform based, data intensive & capital light
New entrants are employing parallel strategies, competing with incumbents...

... while also leveraging their infrastructure
The complementary capabilities of new entrants and incumbents make partnerships logical...

...but also difficult implement
Investing in the year 2035

Early signs of change
Shifting customer preferences will drive more self-directed financial management...

...changing the role of wealth advisors
Retail investors will have access to a radically increased set of capabilities ... 

...accelerating the tempo at which active strategies emerge and are commoditized.
Not all Fintech innovations are customer facing...

...fintech is also delivering new capabilities and unexpected efficiencies
Investing in the year 2035

The Rise of the Machines
Process automation and new information platforms...

...will erode the benefits of scale in many aspects of financial services
The acceleration of machine learning and artificial intelligence...

...will automate unexpected processes with transformative effects
The expanded role of machines intelligence in financial services will transform the role of humans...

...but not always in the ways that we might expect
Investing in the year 2035

Blockchain Revolution
Distributed ledgers like blockchain are built on complex mathematics, cryptography and game theory ...

...but the technology is best thought of as a set of capabilities
The new capabilities offered by blockchain have the potential to...

...re-draw the map of the financial services ecosystem
Blockchain will drive improved efficiency and to disintermediate existing players...

...but the most disruptive impact will be increased transparency
Other implications of blockchain will include...

- Embedded Regulation
- Reduced Settlement Time
- Reduced Counterparty Risk
- A Shifting Role for Central Counterparties
Building distributed financial infrastructure will be long and complex process...

...and it remains difficult to identify who will be the winners and losers
Questions?
2035 Vision: Investing in the Future

Angelo A. Calvello, PhD

Chief Executive Officer
Impact Investment Partners

• Founder of Impact Investment Partners
  – Advises asset owners, asset managers, and consultants on innovation, product development and distribution

• Co-founder and Chairman of Rosetta Analytics, Inc.
  – Boston-based asset management firm that uses non-traditional data and computational methodologies to create and manage investment strategies

• Columnist for CIO Magazine
  – “The Doctor Is In,” won the American Business Media’s 2016 Jesse H. Neal Award for best commentary

• Author of Environmental Alpha: Institutional Investors and Climate Change (Wiley 2009)

• Serves on the Board of Directors of the Network for Sustainable Financial Markets

• Serves on the Advisory Board of the Charter Alternative Investment Analyst (CAIA) Association
What Institutional Investing Will Look Like in 20 Years

Angelo Calvello, PhD
July 18, 2016
Hacking Team

Rely on us.
ASOK, YOU CAN BEAT MARKET AVERAGES BY DOING YOUR OWN STOCK RESEARCH.

SO... YOU BELIEVE EVERY INVESTOR CAN BEAT THE AVERAGE BY READING THE SAME INFORMATION?

YES.

MAKES YOU WONDER WHY MORE PEOPLE DON'T DO IT.

JUST LAZY, I GUESS.

(C) Scott Adams
The Digital Universe: 50-fold Growth from the Beginning of 2010 to the End of 2020

“Information is the oil of the 21st-century and analytics is the combustion engine.”

–Peter Sondergaard, Gartner Research
What can I help you with?

"Text husband"

Which ‘husband’?

spouse Mandy

spouse Scot
Who to follow
Follow more people from the suggestions below, tailored just for you.

Search using a person’s full name or @username

David M. Brear @davidbrear
Chief Thinker @TD_Grp Helping Banking Be Better.
#DigitalBank @FinTechMafia #FinServ25
#nextbank100 #cityampowerlist #FinTech Fiend - Too many exs to name!

Ceres @CeresNews
Mobilizing business leadership for a sustainable world. Projects include @INCRNews @BICEPNews
and @CleanTrillion. Tweets are not endorsements.

claire calmejane @ccalmeja
Bringing to life digital disruption & innovation at LBG,

Unilever World @UnileverWorld
We believe there’s never been a better time to create a #BrightFuture. Our people & brands work to make
this a reality. See the possibilities & get involved.
Followed by Envia, The Climate Group and ISC.

EIRIS @EIRISNews
Leading global provider of environmental, social,
New York
Filter by:
East Village

Airbnb affect
Explore the k
your neighbors

Room Types
Airbnb hosts can
homes/apartment
shared rooms.
Depending on the
availability, and a
airbnb listing could
like a hotel, disrupt
neighbors, taking
housing for New
illegal.
MILLENNIAL
Millennials are “differentiated by their broad adoption of technology, particularly in their deeply ingrained use of digital and social channels in almost every aspect of their lives.”

–Accenture
• Social networks are sources of knowledge
• Accept the wisdom of the crowd over that of authority figures
• Gamification as determinant of value
• Crowdsourcing as a viable economic activity
• Value DIY culture
“Millennials, like the ‘Greatest Generation’ are shaped by an environment of failing or failed institutions and rising new ones.”

—Breaking Smart
“Today, those of us who aren’t machine learning experts have no conceptual model for what a learner does.”

–Pedro Domingos
The weak-form efficient market hypothesis asserts that stock prices will *most likely* fully reflect which of the following types of information?

A. Market only  
B. Market and public information  
C. Public and private information
“Accenture analysis shows that by 2020, cross-functional integrated teams will deliver 80 percent of traditional finance services... Your most essential talent will not be ‘finance’ talent at all. Leading companies will look beyond CPAs and MBAs to hire statisticians, data scientists, behavioral scientists, economists and even anthropologists. ”

–Accenture
DEEP KNOWLEDGE Ventures
“A startup is a company working to solve a problem where the solution is not obvious and success is not guaranteed.”

–Neil Blumenthal, cofounder and co-CEO of Warby Parker
Thank you

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2035 Vision: Investing in the Future

Charles D. Ellis, PhD
Managing Partner, Partners of ‘63

- Founder of Greenwich Associates in 1972
- Serves as a consultant to several of the world’s largest institutional investors, government organizations, and wealthy families
- One of 11 individuals honored by the CFA Institute for lifetime contributions to the investment profession
- Chairs the Whitehead Institute for Biomedical Research
- Served as a successor trustee of Yale University; on the Visiting Committee of the Harvard Business School
- Taught advanced courses in investment management at Yale School of Management and Harvard Business School
- Author of 18 books, including *The Partnership: The Making of Goldman Sachs; Capital: The Story of Long-Term Investment Excellence; and, Winning the Loser’s Game*
### NYSE Changes Over Past 50 Years

<table>
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<th>Mix</th>
<th>Volume</th>
<th>Derivatives</th>
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<tr>
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<td>98:2</td>
<td>5,000M</td>
<td>5,000M</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
Major Changes Over 50 Years

• 300, 300, 300 + & + &

• Analysts, economists, demographers, strategists, industry analysts, company experts

• MBAs and PhDs and MDs

• 120,000 CFAs (and 300,000 candidates)

• Computer models

• Reg FD: Fair Disclosure

• Bloombergs: 320,000 ++

• Internet, voice mail, global networks
Know Your Opponents

- 50 = 50%
- $100M + up
- 2 ‘n’ 25 = High motivation: HF, PE, Activists
- Algorithmic trading
- Globalization of investors
- Globalization of investment
- Mega markets: Stocks + Bonds + FX + RE + Oil + Gold
More Experts = Accelerating Challenges

- Professional Activity: Professional activity has increased significantly from 1966 to 2016.
- Degree of Difficulty: The degree of difficulty has increased exponentially from 1966 to 2016.
Disagreeable Data: Top Secret I

• Mutual funds underperform their chosen targets
  – 60% over “typical” year
  – 70% over 10 years
  – 80% over 20 years

• Losers lose twice as much as winners win
Disagreeable Data: Top Secret II

- Institutional Investors Underperform
  - 75% About average
  - 25% Clearly below market average
  - 0.1% Clearly outperform market
The Great Inversion of the Past

Then:

Client
Manager

Now:

Manager
Client
The Great Inversion of the Future?

Now: 
Manager 
Client

Then: 
Client & Manager
All Funds Are Equal Because…

- Free to choose
- Want to do well
- Want to avoid harm
- Know choices matter
- Lots of choices available
Each Fund Is Different on...

- Time horizon
- Assets
- Actuarial assumption or spending rule
- Risk tolerance
- Obligations
- Importance to constituents
- Source of contributions
- Governance
Hired vs. Fired Managers

Excess return

Fired Firms
Hired Firms

-3 to 0  -2 to 0  -1 to 0  0 to 1  0 to 2  0 to 3
Changing Managers?

- **Small problem:**
  - Hired managers fall below fired managers
  - Costs to change are significant

- **Mid sized problem:**
  - Performance before firing

- **Large problem:**
  - Hiring to fire
  - Repeat
  - Repeat

Einstein understood, but can we?
1st Objective:

Understand our fund’s real goals

• Tolerance for risk in…
  – Assets
  – Funding ratio of 70%
  – Distributions to retirees
  – Liquidity for operations
  – Perceptions by public

• Tolerance for uncertainty

• Utility of over vs. under performance

• Ability to stay the course
2\textsuperscript{nd} Objective: Do No Harm

- Being too conservative
- Being too bold
- Buying high; selling low
  - Asset class
  - Manager
- Converting temporary loss into permanent loss
3rd Objective: Strong Defense

- Risk of real harm is #1 focus
- Robust portfolio structure
- Manager selection
  - Beware of business vs. profession
  - Manager’s strategy for growth in capacity
- Manager management
  - Compensation alignment
  - Changes in manager’s business
  - Changes in manager’s “style”
  - Changes in leadership
  - Actual growth in AUM vs. capacity
4th Objective: Wise Governance

Determine strategy to achieve fund’s goals

• Right for market realities
• Right for CalPERS organization
• Right for long-term returns
• Right for CalPERS risk tolerance
• Feasible and realistic for managers
5th Objective: More???

Looks easy, but results are not encouraging…

• Fund managers underperform

• Past “data” not predictive

• Costs of reaching for “more”
  – Changing managers
  – Changing asset mix
  – Innovating

• Tom Wolfe’s lesson: The Right Stuff
Ski Lesson
Our Great Responsibilities

- Know our constituents
- Know our policy options & constraints
- Make our own choices
- Define our investment objectives
  - Risks
  - Returns
  - Liquidity
- Design our strategic portfolio
- Stay the course
Top Secret: The Truth about Fees

• ½% of assets
• 8% of returns
• 75-150% of incremental returns

Caveat Emptor: Be sure you know what you are really buying
Active Management Today: By Clients

• Knowing real objectives and balancing risk, returns, and liquidity
• Agreeing on important policies
• Designing strategic portfolio
• Overseeing manager management
• Maintaining discipline in process
• Deciding on indexing
What Really Matters

• Value Discovery?

• Price Discovery?

Understanding the investor is at least as important as understanding the markets
Old Concept of Active
New Concept of Active
Without Good Governance...

WE HAVE MET THE ENEMY AND HE IS US.
Panel Discussion – How will we invest in 2035?

- Any "big" risks you can foresee in the market? including potential bubbles that may result from current central bank policy, lingering low interest rate environment, technology company valuations, etc.?

How will the nature of Fiduciary responsibility and duty differ in 2035?

- Will there be shifts in information and power “symmetries” between Asset Managers and Asset Owners?

- For environmental/climate change related discussions, what are specific risk mitigation strategies we need to consider?

- Merits and challenges of establishing local offices overseas, in particular, issues related to civil service requirements and other personnel or legal risks?

How will man and machine integrate to create efficient markets?

- What new skill sets will investors require in 20 years?

- Will the Active vs Passive debate ever be over?