

Regulating Robo Advisors Across the Financial Services Industry

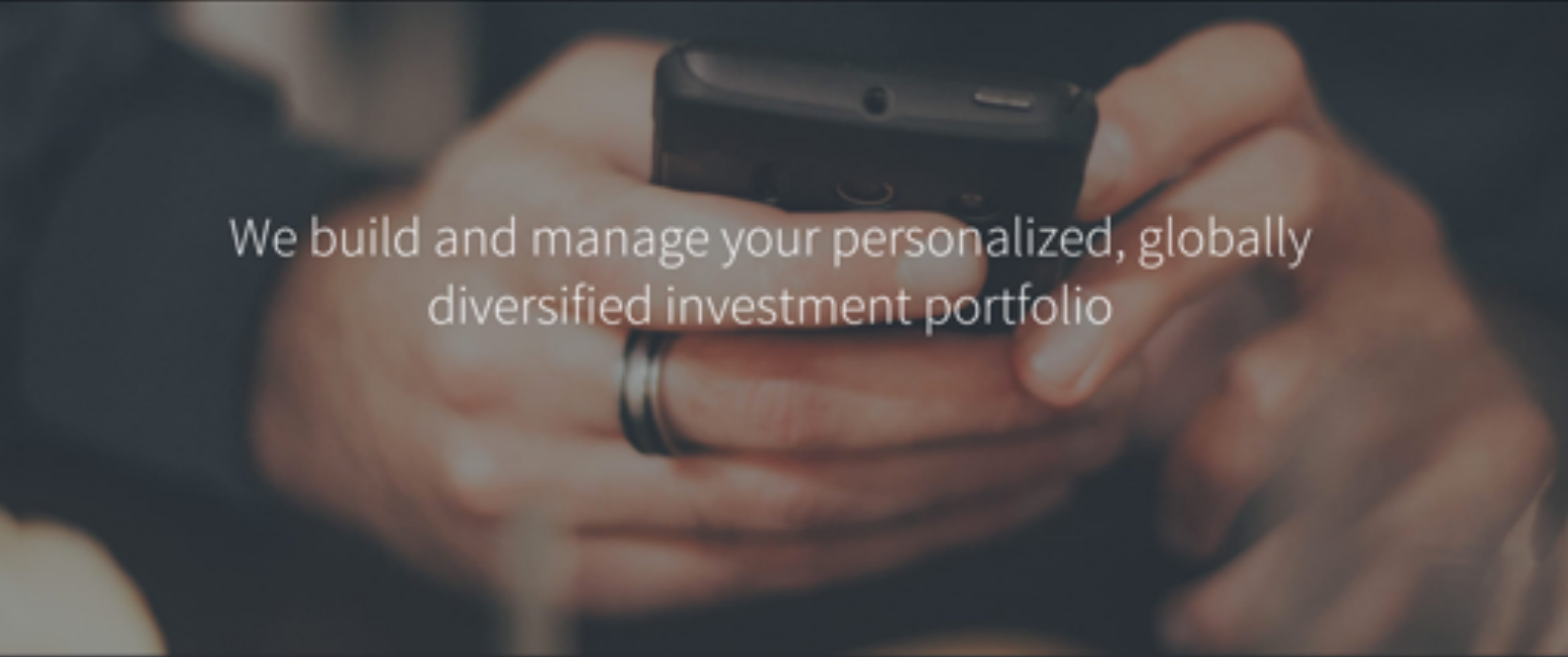
Tom Baker & Benedict Delleart
Penn Optimizing Government Project

12/8/2016

What is a robo advisor?

- An automated service that ranks, or matches consumers to, financial products *on a personalized basis*, embedded in:
 - **Consumer financial product intermediaries:**
 - Insurance exchanges, brokers & companies:
 - Financial advisors & broker dealers
 - Mortgage brokers
 - **Lead generation services:**
 - Domain specific media companies: Zillow
 - Web based financial advice/mgt services: Mint.com, NerdWallet
 - Web-based advertising aggregators





We build and manage your personalized, globally diversified investment portfolio

DIFFERENT INVESTMENT ACCOUNTS TO SUIT YOUR NEEDS

When you open an account you'll get a personalized asset allocation based on your risk score and the account's tax status.

[Invest Now](#)



Experts are behind
every choice we
make.

Our technology is what makes Betterment better – we believe it's simply the best that's available today. But we also have industry experts with decades of experience who guide everything we do, from the tax tools we build to the funds we choose for our portfolio.

[Meet our team of experts >](#)

Dan Egan
Director of Investing

[Buy](#)[Rent](#)[Sell](#)[Mortgages](#)[Agent finder](#)[Advice](#)[Home design](#)[More](#)[Advertise](#)[Sign in or Join](#)[Mortgage lenders](#)[Mortgage rates](#)[Mortgage calculator](#)[Directory](#)

Mortgage Rates · Compare Mortgage Rates and Home Loans

Compare Mortgage Rates and Home Loans

[Advertising Disclosure](#)

Enter your home loan details to get personalized quotes with today's current mortgage rates.

Loan purpose

ZIP code



Purchase price

Down payment

Credit score

Military/Veteran?

GET PERSONALIZED RATES



HERE

It's fast and easy!

To get rates for your own situation:

- Fill out these fields
- See results in seconds

Filter

30 year fixed

4.071% APR

4.000% Rate · \$1,146/mo · \$3,281 in fees

[View details](#)

[Lender website](#)



FEATURED

★★★★★ 4.79/5

1,004 Reviews

Citibank, NA

NMLS #412915

30 year fixed

4.186% APR

4.125% Rate · \$1,163/mo · \$1,740 in fees

[View details](#)

[Lender website](#)



★★★★★ 4.56/5

1,040 Reviews

30 year fixed

3.778% APR

[View details](#)

Find the best credit cards for you.

Whether you're looking for side-by-side comparisons, info around rewards versus points or you're ready to apply, we've gathered everything you need in one easy place.



Compare over 1700 credit cards, fast.



Rewards



Cash Back



Balance Transfer



Travel



We can help you choose the right health plan.

Answer a few questions and we will identify plans that fit your needs. It's quick & easy!



Help Me Choose

[No Thanks. Browse On My Own](#)



How It Works



Quick & Easy Process

Three short steps to collect the medications, doctors and other information used to determine plan "fit".



Your Score

Your Plan Score (100 being the highest), determined on a number of dimensions, identifies how well each plan fits your needs.



Utilize our detailed cost estimations and benefit descriptions to make the right, educated decision for you.



BASIC INFO
INCOMPLETE

MEDICATIONS
INCOMPLETE

PROVIDERS
INCOMPLETE

VIEW PLANS

Complete Your Profile

Basic Information

To ensure the most relevant plans are shown to you, please provide some basic information.

Find the Right Plans

Please answer the following questions in each section to help us find plans you qualify for and estimate the monthly premium for each plan.

What coverage are you looking for?

Medical & Prescription

What is your ZIP code?

14482

What is your County?

Genesee

When should coverage begin?

1/1/2017

What is your date of birth?

October

12

1932

What is your gender?

Male

Female

Do you use tobacco products?

Yes

No

Are you disabled?

Yes

No

Do you have end stage renal disease?

Yes

No

[« Back](#)

egrated-guidance.aspx?zip=14482#next

[Next »](#)



BASIC INFO
COMPLETE

MEDICATIONS
0 MEDICATIONS

PROVIDERS
INCOMPLETE

VIEW PLANS

Complete Your
Profile

Medications

Let's make sure you are covered for the medications you take

Do you take any prescription medications? Yes No

Enter Medications

Please enter medications to see whether or not they are covered under each available plan. Results will be displayed under 'View Plan Details' for each available plan on the results page.

Add Medication

Current Medications

[« Back](#)

[Exit to Plans](#)

[Next »](#)



Medicare Advantage Plans with Prescription Drug Coverage



[UnitedHealthcare Medicare Complete Choice Plan 3 \(Regional PPO\)](#)

Network Type: PPO

CMS Star Rating: ★★★★★

Premium **\$36^{.00}/mo**

Estimated Out of Pocket Costs **\$505 - \$1,807/yr**

[Add to Cart](#)

[Your Score Explained](#)

[View Plan Details](#)

[Out of Pocket Costs Explained](#)

[Mail Order Savings](#)

Compare Plan

Save Plan



How Your Plan Score Was Calculated

Your Plan Score (100 being the highest score) informs you how well each plan fits your needs. Its calculation is based on prescription costs, predicted medical usage of "people like you", and other factors. Some high-level scoring dimensions are provided here. [Learn More](#)

Out of Pocket Costs **Above Average**

Risk Protection **Above Average**

Star Rating Impact **Above Average**



[UnitedHealthcare Medicare Complete Choice Plan 4 \(Regional PPO\)](#)

Network Type: PPO

CMS Star Rating: ★★★★★

Premium **\$66^{.00}/mo**

Estimated Out of Pocket Costs **\$858 - \$2,035/yr**

[Add to Cart](#)

[Your Score Explained](#)

[View Plan Details](#)

[Out of Pocket Costs Explained](#)

[Mail Order Savings](#)

Compare Plan

Save Plan



Premium **\$0^{.00}/mo**

[UnitedHealthcare Medicare Complete Choice](#)

In theory, robo advisors are:

- Always on
- 100% competent at the (really difficult) math
- Immune to the paradox of choice
- Unbiased
- Transparent
- Scalable: marginal cost rapidly approaches \$0

Core components (regulatory focal points)

- Algorithms
- Data:
 - Financial products & attributes
 - Consumer attributes
- Choice architecture (user interface)
- IT infrastructure

Regulatory focal points

Core component

1. Algorithms:
2. Data:
 1. Financial products & attributes
 2. Consumer attributes
3. Choice architecture (user interface)
4. IT infrastructure

Regulatory concern

1. Bias, competence, fairness
2. Access, quality,
 1. Producers won't provide
 2. Consumer data incomplete, biased
3. Bias, competence
4. Security, privacy, reliability

Questions about algorithms

- What is the objective?
- What are the product and consumer attributes taken into account?
- Are there any other factors taken into account?
- What are factors you'd like to take into account but cannot?
- What factors did you consider and reject? Why?
- How were the weights assigned to attributes?
 - Data and methodology follow ups
- How do you identify edge cases? What do you do about them?
- How is success measured & improved over time?

Questions about data

- Where do you get your product (customer) data?
- What other sources of data are there?
- What data about product attributes do the manufacturers have that you do not?
- What data about customer attributes would you like to get but cannot?
- How do you check quality of the data?
 - What problems have you found and how have you overcome them?
 - What do you do about missing data?

Questions about choice architecture

- Did you follow recognized best practices?
- What do you track about progress through the choice environment?
- What patterns do you see in variance between recommendations and choices? What do you learn from them?

Beyond basic competence

- Challenge:
 - Promoting diversity and quality among robo advisors
 - Contests (and contests of contests)
- Opportunities:
 - Greater intermediary accountability
 - Greater product diversity without the paradox of choice

Who are the regulators?

- Financial services authorities:
 - CFPB
 - State insurance departments
- Other agencies:
 - FTC – UDTPA
 - State level consumer protection agencies
- Self regulatory organizations: FINRA
- Accounting firms: will there be SOC 4 & SOC 5?
- Other certification entrepreneurs
- Large contracting partners
- Insurance companies (cyber insurance)