



# Econ-ARK: Economically Informed Financial Advice

Revolutionizing economic modelling with [open-source computational tools](#)

# **The future of economic modelling**

# Challenges to economic modelling

Traditional economic modelling remains inaccessible and unsuitable for business and policy application



## Complexity

Real-world complexity has been difficult to incorporate into applied economic modelling



## Simplifying mathematical assumptions

Economists traditionally addressed challenges of complexity by making simplifying assumptions

- These assumptions often lead to **nonsensical policy and financial advice**



## Financial planning is hard

Nobody should feel incompetent whilst navigating the financial advice landscape -- lifecycle saving decisions *really are* complex, so complex that getting the answer *right* requires the best computational tools we have

- Current methods used to give financial advice are not based on analysis of what is **optimal for the customer**

# Computational advances

Advances in computational power



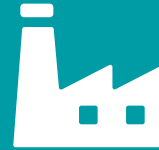
## Computation

Advances in computational **power** and **algorithms** now allow economists to solve more complex models that can answer real world questions



## Household decisions

Lifecycle models can robustly solve the complex decision-making processes of households, including consumption, savings, and investment choices



## Firm behavior

Industrial organization models can simulate the production, pricing, and investment decisions of firms, helping to understand market dynamics



## Macroeconomics

General equilibrium models can be used to capture interaction of households and firms across entire economies, allowing for monetary and fiscal policy analysis and forecasting

Econ-ARK leverages computation to bridge the gap between theory and `real-world' application

**"The widespread adoption of advanced computational methods by economists in government and industry is hindered by the intricate, idiosyncratic development of economic models by a small number of pioneering scholars and their protégés."**

CHRIS CARROLL

# Structural models vs. AI

Why is structural economic modeling different to AI?

- **Interpretable**

Structural models use powerful computers to make **economic mechanisms** transparent, interpretable and open to scrutiny

- **Scenario generation**

Structural models are used to run counterfactual 'what if' analyses, **robustly** illuminating the impact of policies on possibly **unobserved economic variables**

- **Rigour**

Structural models allow for rigorous testing, validation, and **communication of economic mechanisms** to both academic and policy audiences

- **Bridging Theory & Data**

Computational resources are used to discipline theoretical models. Instead of abandoning economic theory, structural models align theory with the 'real world'

- **No Black Boxes**

Unlike many AI/ML approaches, structural models are not opaque 'black boxes' but rather rely on clear, economic relationships between variables

# The Econ-ARK project

Open-source tool-kit enabling the application of advanced economic analysis to business and policy

- **Computational Economics**

Advance the frontier of computational techniques in economics so that policy makers and the private sector can tackle complex, **high stakes** problems using structural economic models

- **Open-Source**

Provide a modern, robust, and open-source set of high-quality computational tools for the research community outside and within academia

- **Modular Design**

Allow researchers to mix, match, and extend the tool components within their existing workflows to model their own problems

- **Lowering Barriers**

Make it much easier for new scholars to begin using these powerful computational techniques in their research

**Personalized financial advice**





# Personalized financial advice

Primary area of focus for Econ-ARK has been models that use fund data to generate optimal portfolio allocations for individuals -- **lifecycle models**

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## PROJECT SPONSORS



# Why use structural economic models for financial advice?



Existing **third party methods** to generate personalized financial advice are 'black boxes' and incorporate ad-hoc financial 'modelling' with opaque subjective judgements regarding how people should save

- Existing methods do not consider what is economically and mathematically optimal for the customer
- Existing methods cannot provide a defensible economic justification for advice



Econ-ARK tools can be used to provide customized advice regarding **optimal** accumulation, decumulation and asset composition

Advice can be customized based on **individual characteristics such as:**

- wealth
- occupation
- income
- risk preferences
- family size



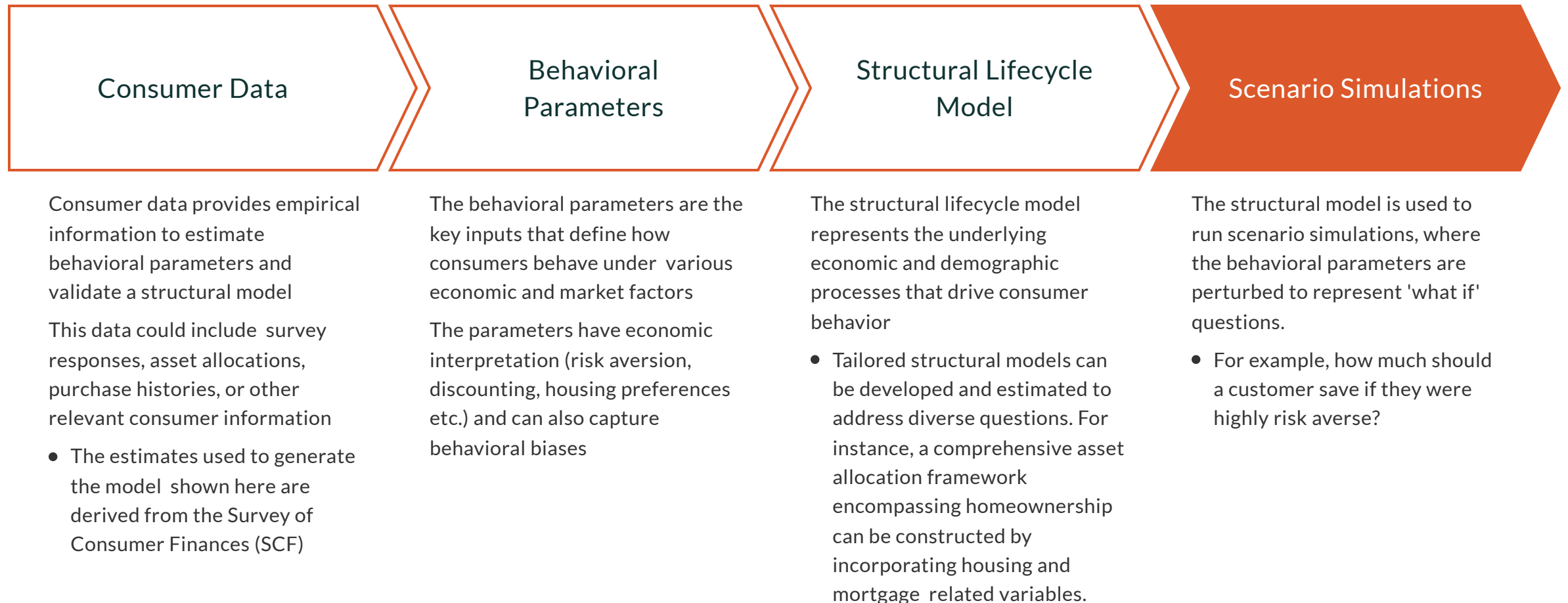
Advice based on structural modelling has a foundation in rigorous economic reasoning that can be **clearly explained**

- 👍 Economic rigor enables fund managers to meet their **fiduciary duties** and **improve customer engagement and financial outcomes**

# Personalized financial advice

How much should an individual save and how should they allocate their savings?

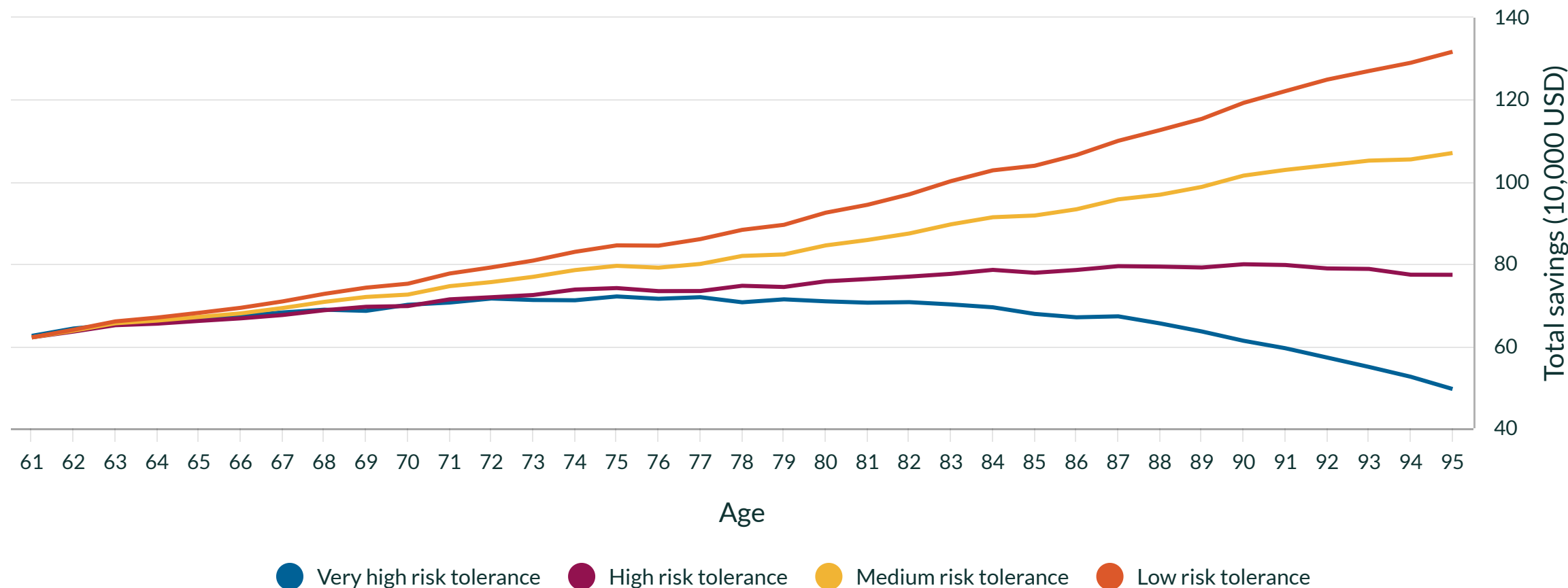
[Check out the Econ-ARK lifecycle model tutorial](#) for complete technical details (and to run the models yourself!)



# Simulations

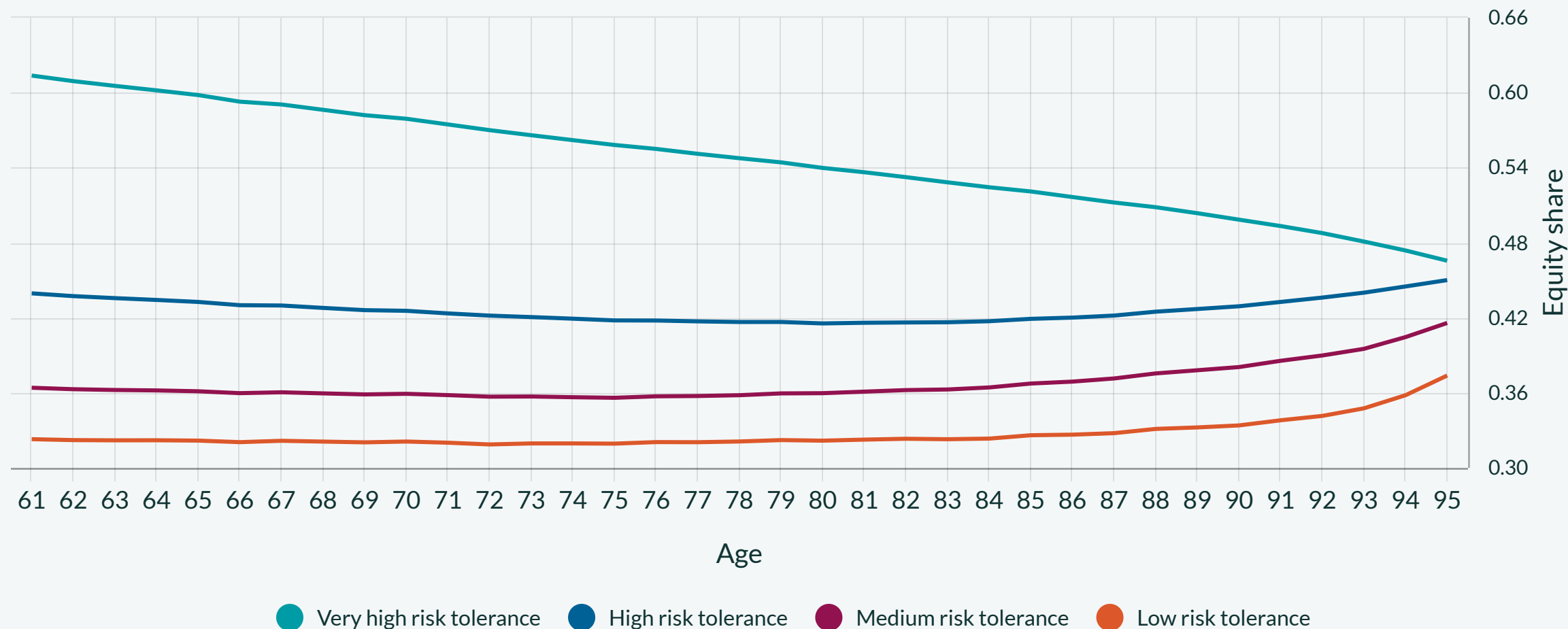
# Scenario 1: Risk tolerance and retirement glide path

How much should retirees with different levels of risk save?



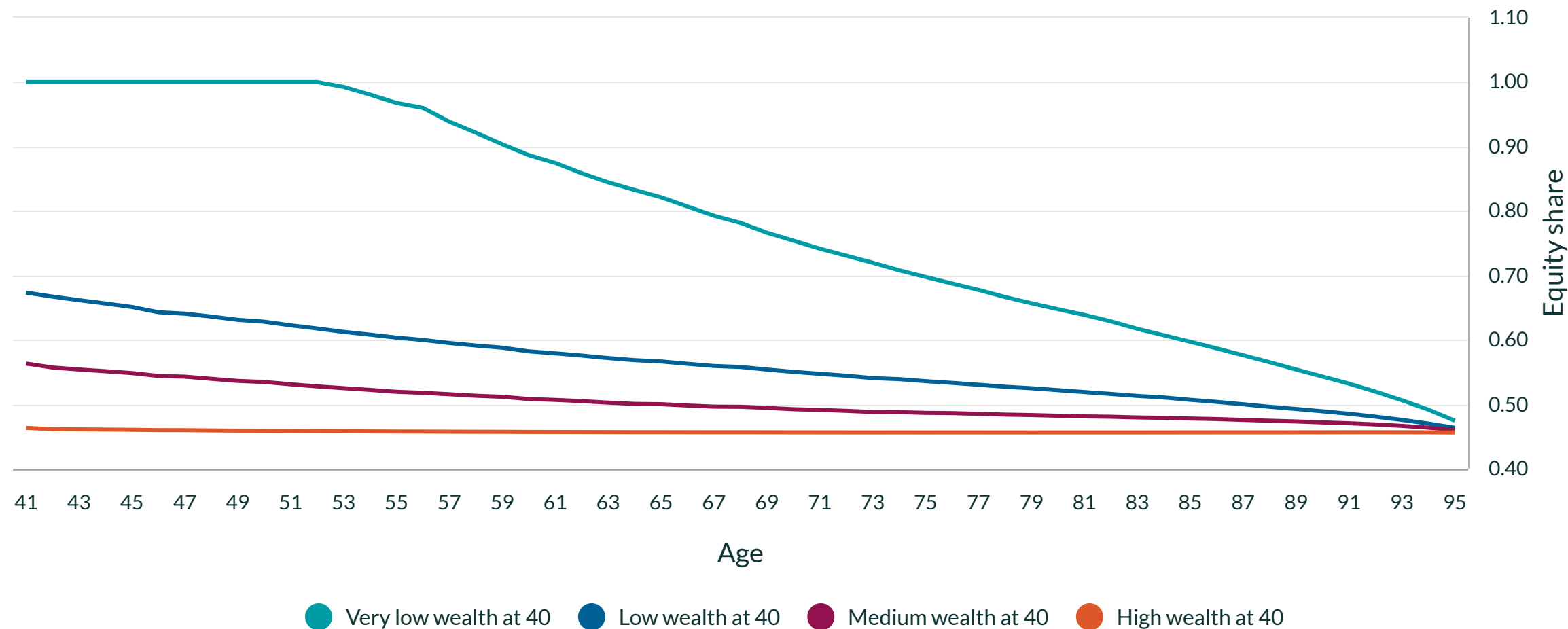
# Scenario 2: Risk tolerance and retirement portfolio

Optimal equity shares for retirees with different levels of risk tolerance



# Scenario 3: Wealth and portfolio share

Optimal equity share of portfolio for different levels of individual wealth



**Engage with Econ-ARK**



# Engage with Econ-ARK

## Corporate Sponsorship

Become a corporate partner and support econ-ARK research and development. Help develop cutting-edge economic models and thought leadership in consumer finance.

## Joint Research

Lead the frontier of the industry by collaborating with econ-ARK on technical research projects.

## Bespoke Model Development

Work with econ-ark to build custom economic models tailored to your organization's needs, ensuring data-driven decision-making and strategic planning.

## Training and Workshops

Participate in econ-ARK specialized training programs and workshops to up-skill your team on the latest economic modeling techniques and applications.

# Further applications in consumer finance



## Customer Insights

Gain insights into customer's behaviors, financial position and how they would respond to economic shocks

- **Example:** Identify customer segments under financial distress, target segments with 'emergency reserve building' products



## Marketing Campaigns

Use economically informed behavioral models to evaluate and simulate effect of marketing campaigns

- **Example:** How do casual workers respond to a campaign to raise their awareness about their pension fund balance?

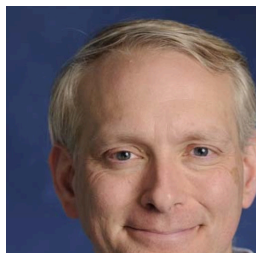


## Credit Risk

Evaluate the impact of macroeconomic shocks to retirement security and balance sheets across a financial institution

- **Example:** How is a lender's asset health impacted by customer default risk if interest rates rise?

# Econ-Ark team



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