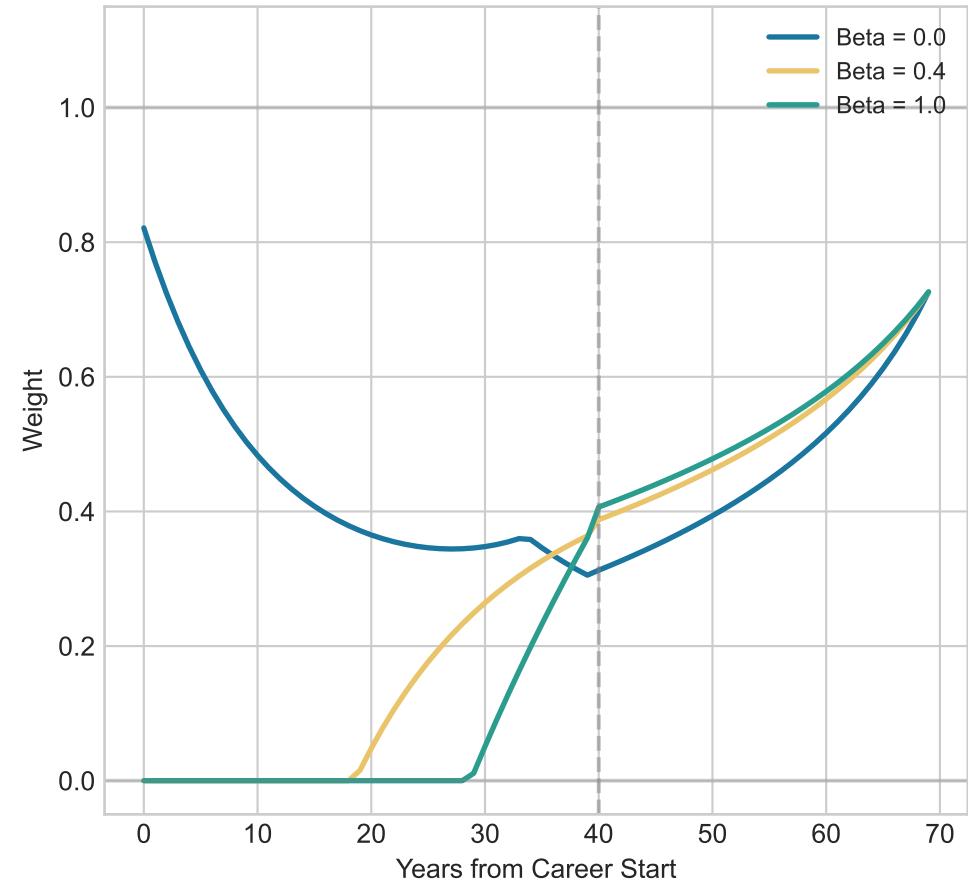
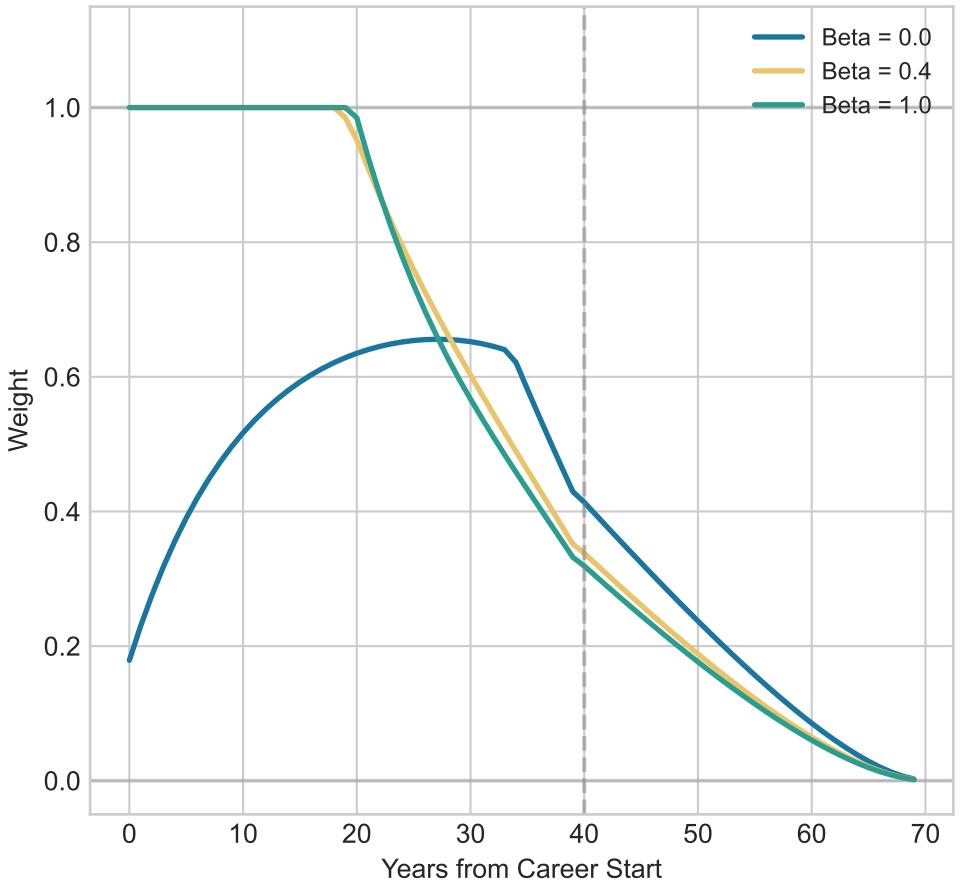


# Effect of Stock Beta on Portfolio Allocation & Human Capital

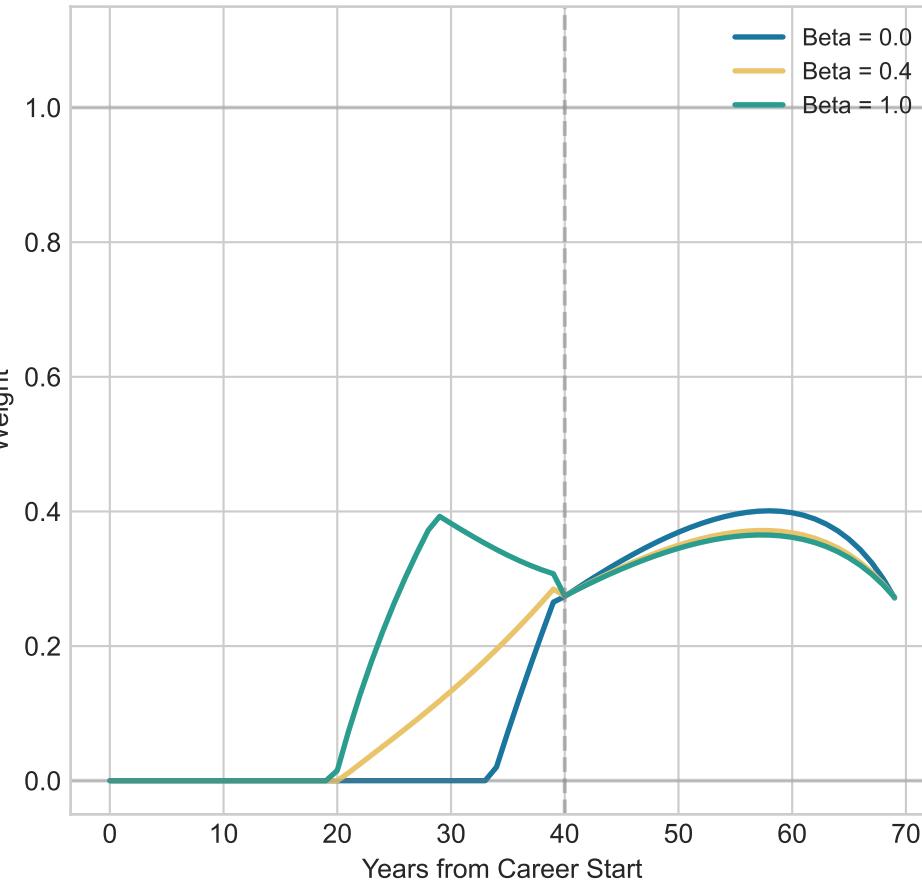
Stock Weight by Beta



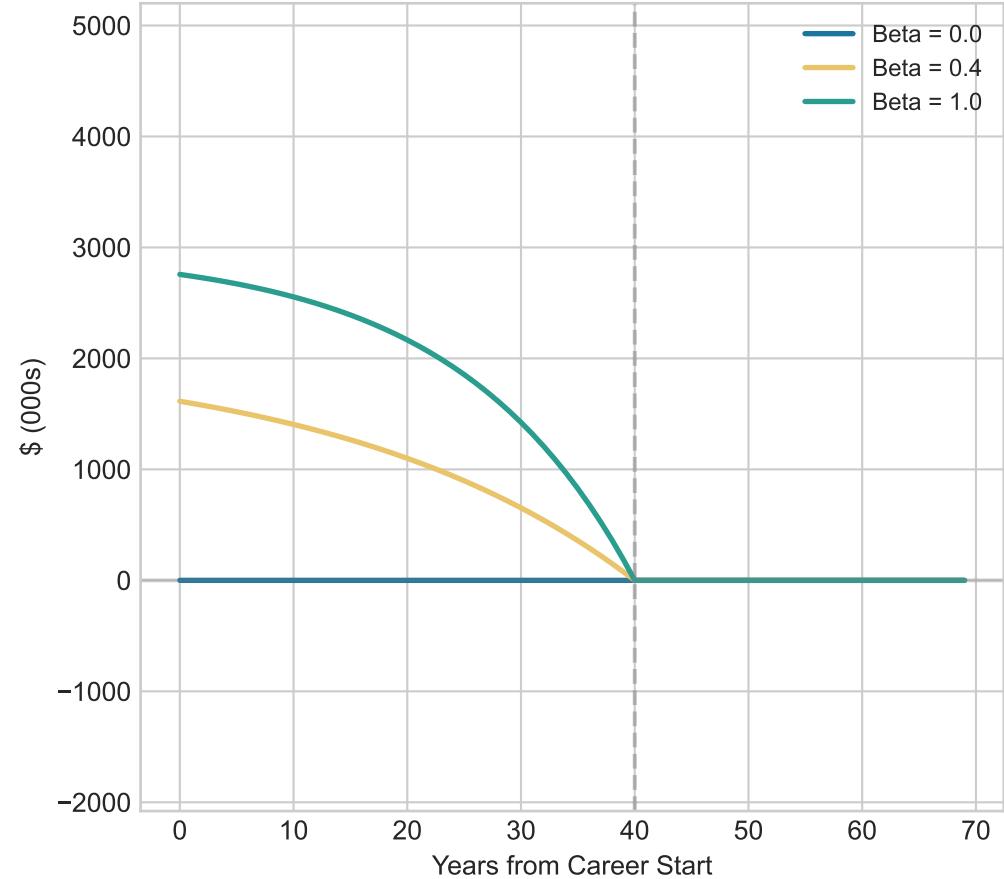
Bond Weight by Beta



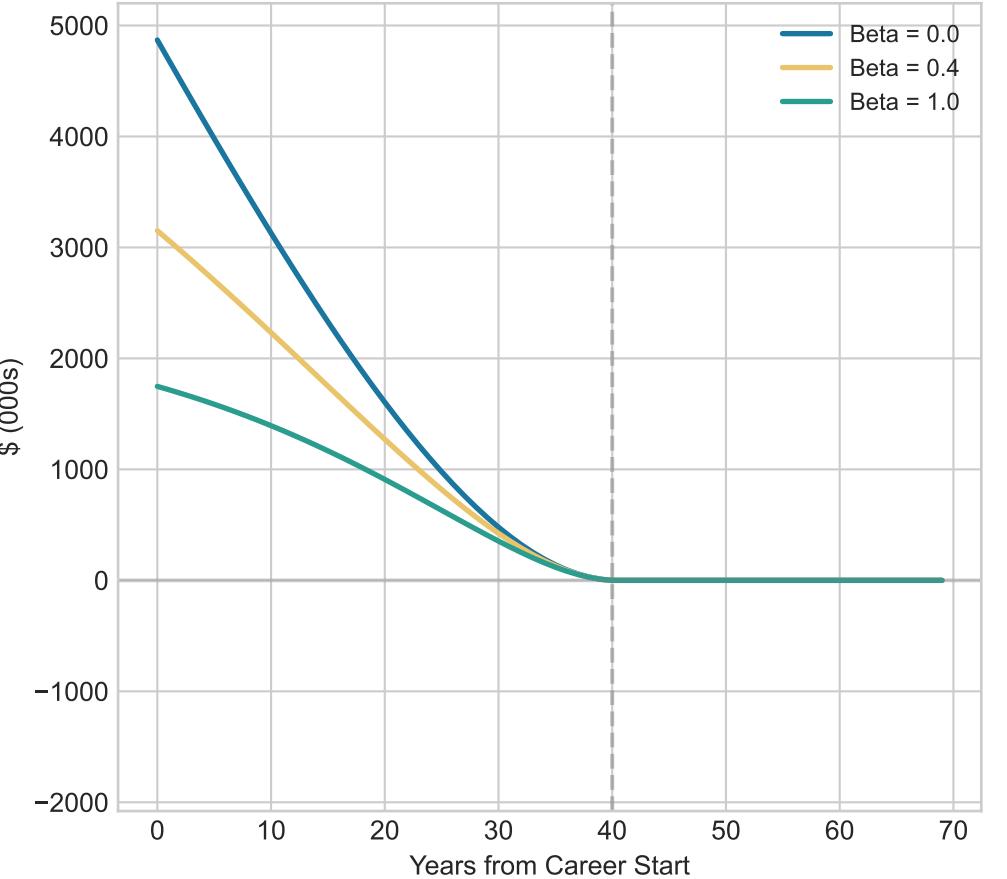
Cash Weight by Beta



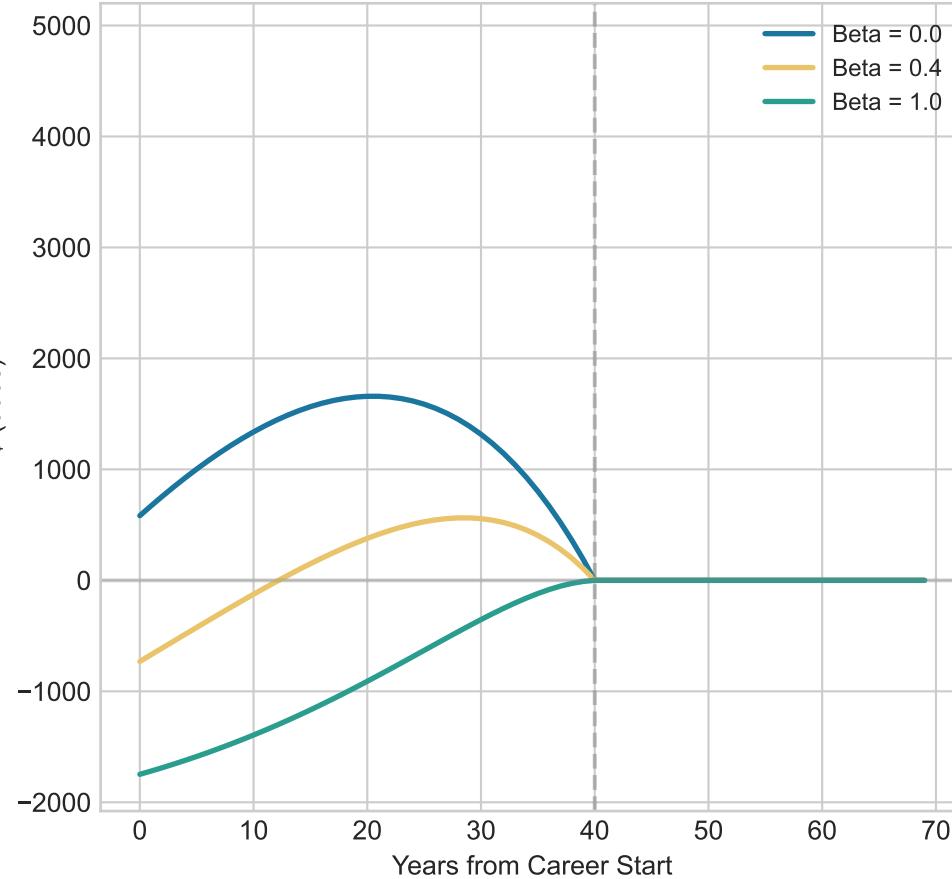
Stock Component of Human Capital



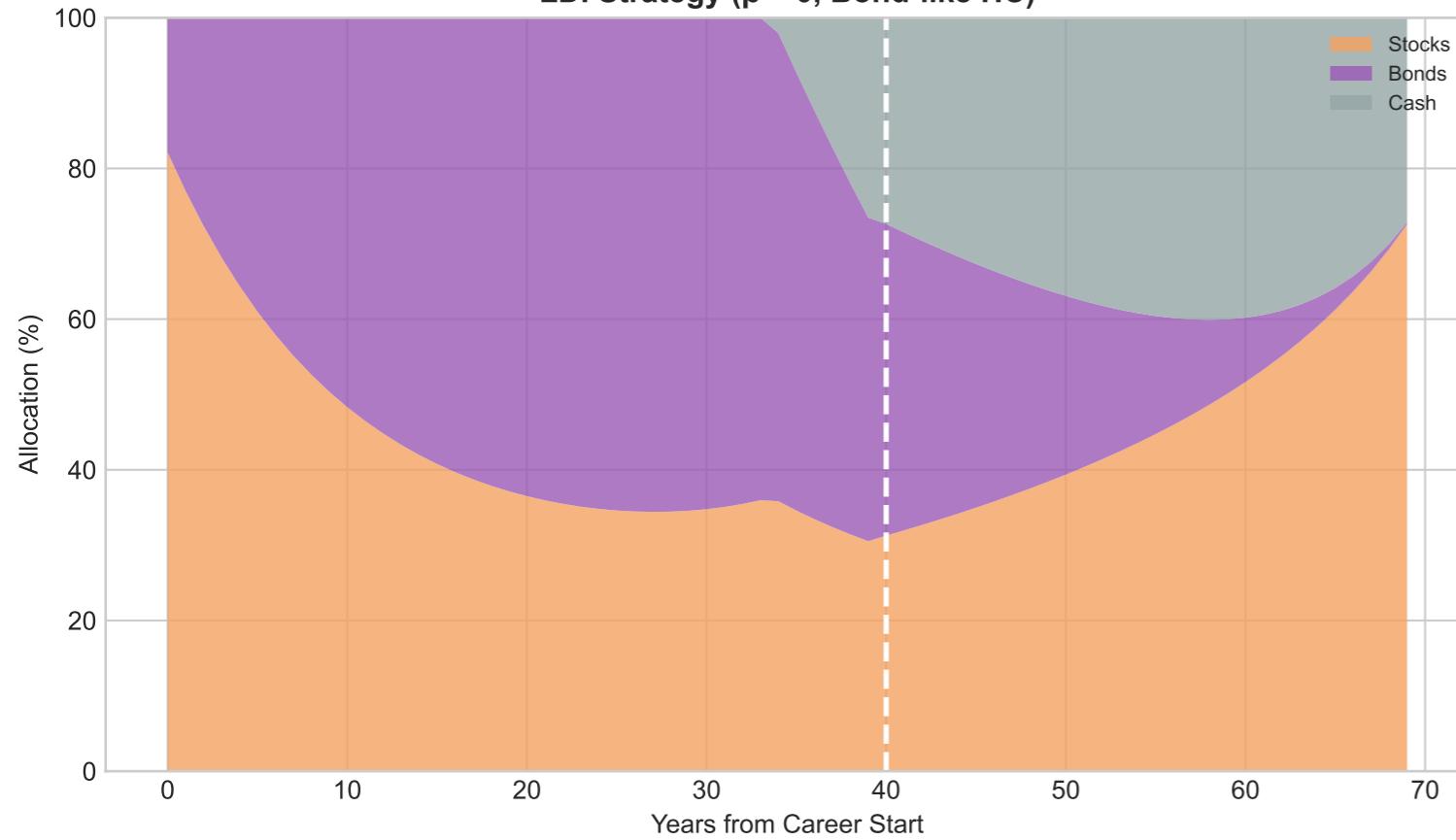
Bond Component of Human Capital



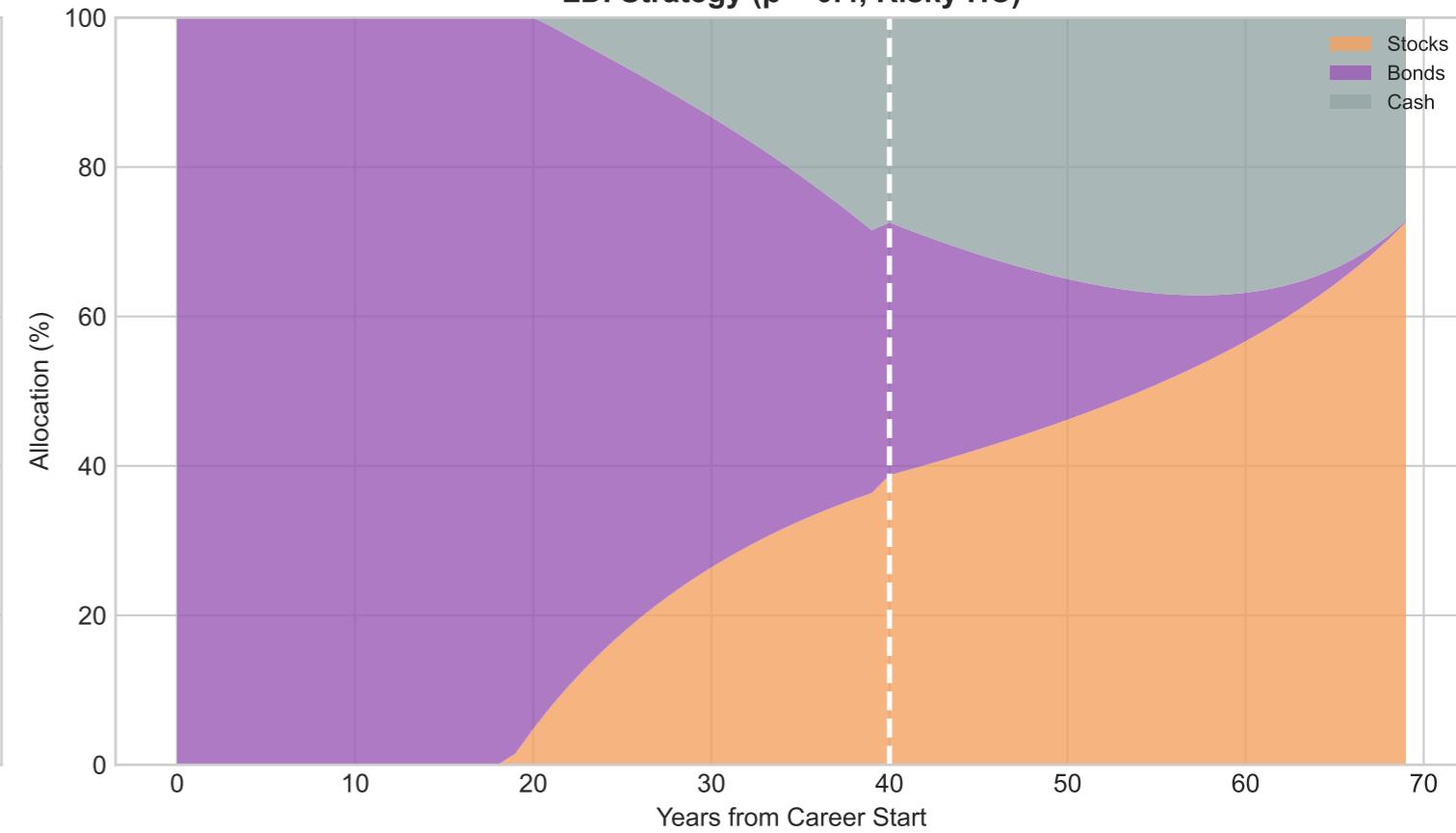
Cash Component of Human Capital



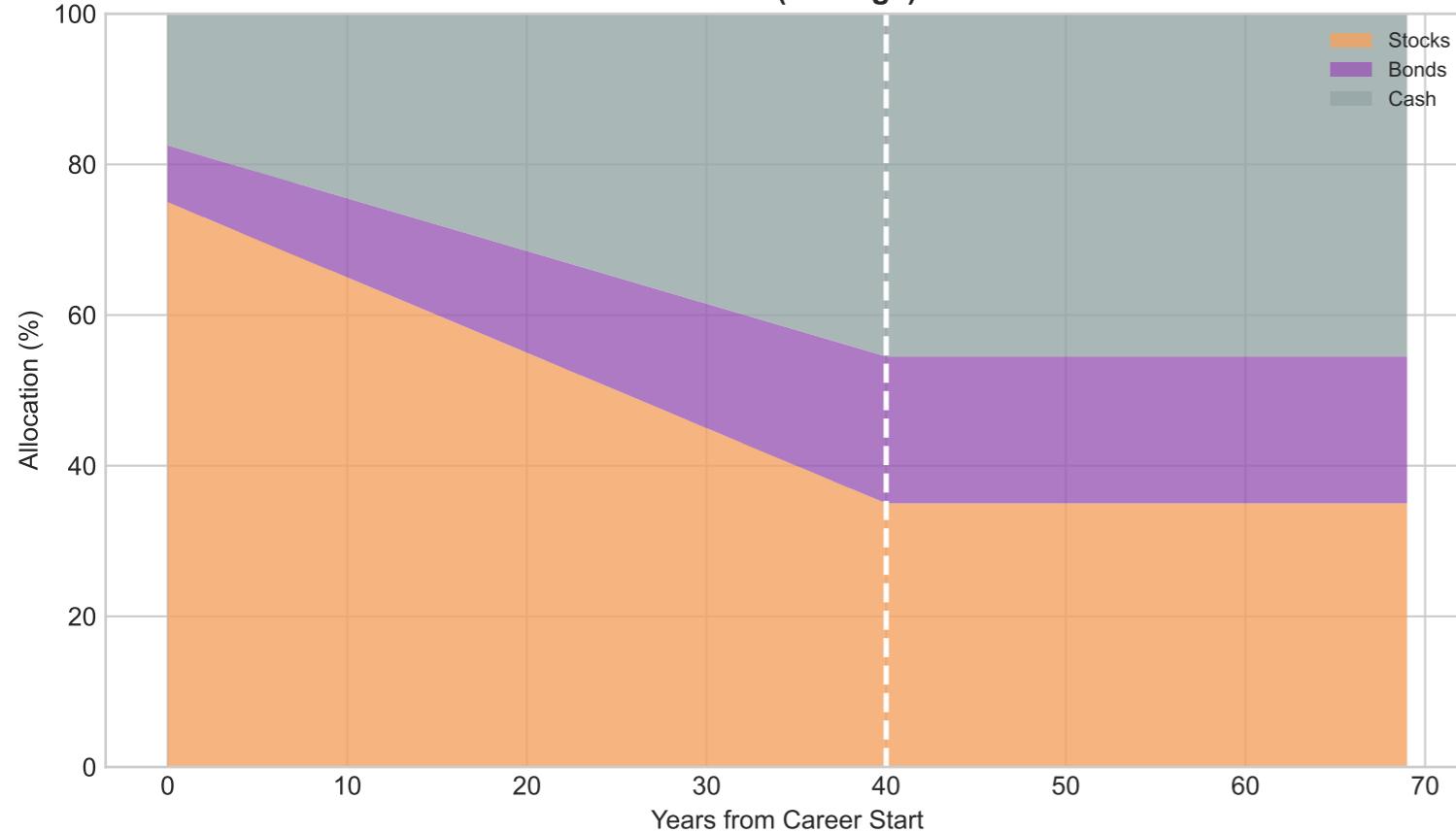
**LDI Strategy ( $\beta = 0$ , Bond-like HC)**



**LDI Strategy ( $\beta = 0.4$ , Risky HC)**



**Rule-of-Thumb: (100-Age)% Stock**



#### Portfolio Allocation Summary

LDI Strategy adapts allocation based on:

- Human capital composition ( $\beta$ )
- Net worth (HC + FW - Expenses)
- Mean-variance optimal weights

When  $\beta = 0$  (bond-like human capital):  
→ HC acts like a bond, so financial portfolio tilts toward stocks

When  $\beta = 0.4$  (risky human capital):  
→ HC has stock exposure, so financial portfolio reduces stock allocation

Rule-of-Thumb ignores human capital:

- Stock weight =  $(100 - \text{age})\%$
- Same allocation regardless of  $\beta$

## Lifecycle Investment Strategy Parameters

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### Age Parameters:

- Career Start: 25
- Retirement Age: 65
- Planning Horizon: 95

### Income Parameters:

- Initial Earnings: \$200k
- Earnings Growth: 0.0%

### Expense Parameters:

- Base Expenses: \$100k
- Retirement Expenses: \$100k

Initial Wealth: \$100k

### Economic Parameters:

- Risk-Free Rate: 2.0%
- Equity Premium: 4.5%
- Stock Volatility: 18%
- Risk Aversion (gamma): 2.0

### Human Capital:

- Stock Beta: 0.00
- Bond Duration: 20.0 years

### Target Allocation (Mean-Variance Optimization):

- Stocks: 69.4%
- Bonds: 0.0%
- Cash: 30.6%