Three Central Investment Mistakes (and how to mitigate their prevalence)

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ERISA Primer

- Fiduciary duties,
- But 404(c) safe harbor if participant control over assets
  at least 3 menu options, and
  sufficient info

Judicial Responses

Too focused on:

- Decision procedures
- Number of menu options

Insufficiently focused on:

- Excessive fees
- Menu design defects

Judicial Responses

For example, *Hecker (7th Cir. 2009)*

"untenable to suggest that all of the more than 2500 publicly available investment options had excessive expense ratios."

Data

- Proprietary dataset from Brightscope, Inc.
- Scraped from 2009 Form 5500A
  - Plan-level fees
  - Aggregate investor holdings
- ~3,500 plans with $120 billion in assets
  - Only public mutual fund shares
  - Match on CRSP and Morningstar
  - Selection issues

Predicting Expected Returns

- Estimate a Factor Model
- $R_{it} - r_f = \beta_{i1} * (r_{mkt,t} - r_f) + \beta_{i2} * (r_{bond,t} - r_f) + \beta_{i3} * (r_{intl,t} - r_f) + \varepsilon$

A Bad Plan

Plan 1

Plan Participants with Balances = 132; Net Assets = $2,481,222
Fiduciary Loss: 2.67%; Excess Fee Loss = 1.17%; Excess Plan Expense Loss: 1.3%; Menu Diversification Loss: 0.15%

Fund Name	**Provider**	**Morningstar Category**	**Net Expense Ratio (%)**
AllianceBernstein International Value	AllianceBernstein	Foreign Large Value	1.56%
American Funds Growth Fund of America	American Funds	Large Growth	0.69%
AllianceBernstein Balanced Shares	AllianceBernstein	Moderate Allocation	1.33%
Eaton Vance Large-Cap Value	Eaton Vance	Large Value	1.23%
Delaware High-Yield Opportunities	Delaware Investments	High Yield Bond	1.57%
BlackRock Government Income	BlackRock, Inc.	Intermediate Government	1.17%
…	..	..	..

Dominated Fund

A fund no reasonable (informed) person would invest in

Dominated Fund Estimates

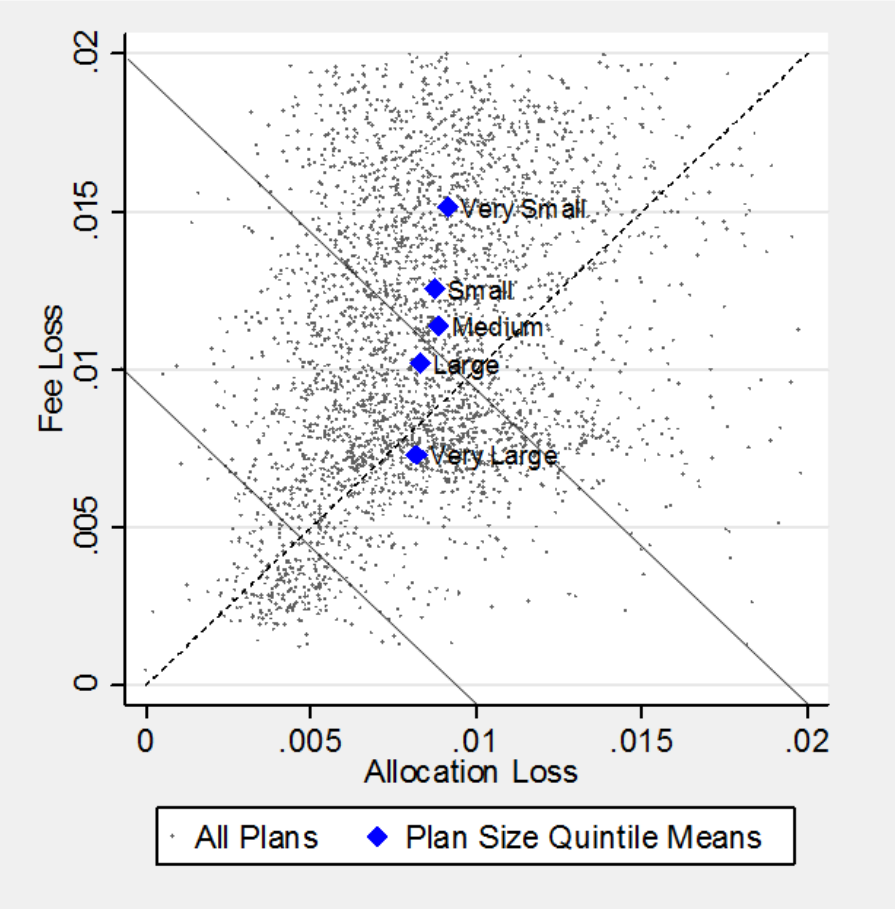
- 52% of plans offer at least one
- Hold 11.5% of plan assets
- Underperformed menu alternative by > 60 basis points

Dominated Fund Reform

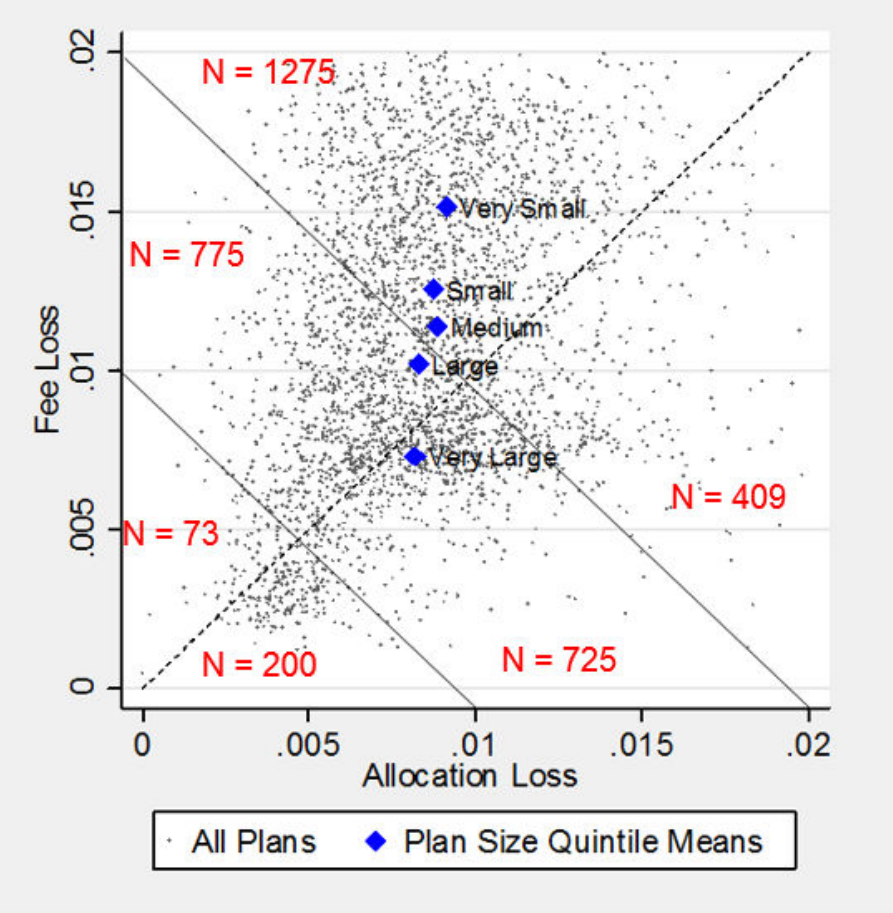
- Stop offering
- Contra *Hecker*
- Design defect
- Failure to map from dominated funds
- Mapping to dominated fund

Excess Fees More Generally

Comparing Fee and Allocation Loss



Comparing Fee and Allocation Loss



Two Ways of Dividing Losses

	Mean Loss	% of Total Mean Loss
Menu Diversification Loss	0.06%	3.8%
Menu Excess Expense Loss	0.43%	27.6%
Total Fiduciary Loss	0.50%	32.1%
Investor Diversification Loss	0.65%	41.7%
Investor Excess Expense Loss	0.49%	31.4%
Total Investor Loss	1.06%	67.9%
Total Excess Expense Loss	0.85%	54.5%
Total Diversification Loss	0.71%	45.5%
Total Loss	1.56%	100.0%

Fees are so high:

- For plans with company stock, 48% the co. stock option reduces fiduciary loss
- With 16% of plans, young investors would be better off foregoing tax benefit and investing in stand-alone funds
- Several plans offer mutual funds with negative guaranteed interest rate

Do services justify fees?

Within industry, higher fees associated with:

- Lower participation
- Lower contributions
- Poorer investor diversification

Exposure Mistakes

- Self-directed plans create opportunities for unreasonably high or low exposure to stock market
- At end of 2007:
  - 50.4% of 401k participants in their 20s had no equity
  - 22.2% of 401k participants ages 56-65 had 90+% in equities

Enhanced disclosures and fiduciary duties are unlikely to solve the excess fee, diversification, and exposure problems.

Robo-Advising Platform

- Super cheap for 401(k)s
- Provide each participant with algorithmic advice including warning when participant is making
  (1) fee,
  (2) diversification,
  (3) exposure or
  (4) contribution mistakes.

Excess Fee Reforms

- EQDIA (50bp) proposal
- High-cost designation (100bp proposal)
- In-service rollover proposal
- Sophistication test proposal

Improved Performance Guarantee

- Guarantee 100% of downside in relative performance in exchange for 20% of the upside.
- Target funds with excessive fees
  - Quasi-riskless arbitrage
  - diversified portfolio of high-fee funds
- Target plans with excessive fees

EQDIA Proposal

- Enhanced default
- Three investor mistakes:
  - Diversification
  - Exposure
  - Fee
- QDIA only addresses first two
- EQDIA should be < 50 basis points

“High-cost” Designation Proposal

- Inspired by “high-cost” mortgages
- Plans with average plan and fund level costs that exceed 100 basis points (the average expense ratios of a mixed portfolio of index funds + 75 basis points) would be publicly designated as "high-cost" plans

In-service Rollover Proposal

- Participants in any "high cost" plan would be able to make an ongoing "in service" rollover to IRAs offering EQDIAs

Sophistication Test Proposal

- Must pass a sophistication test before being allowed to invest in non-EQDIA funds
- Most radical
- Error-reducing altering rules

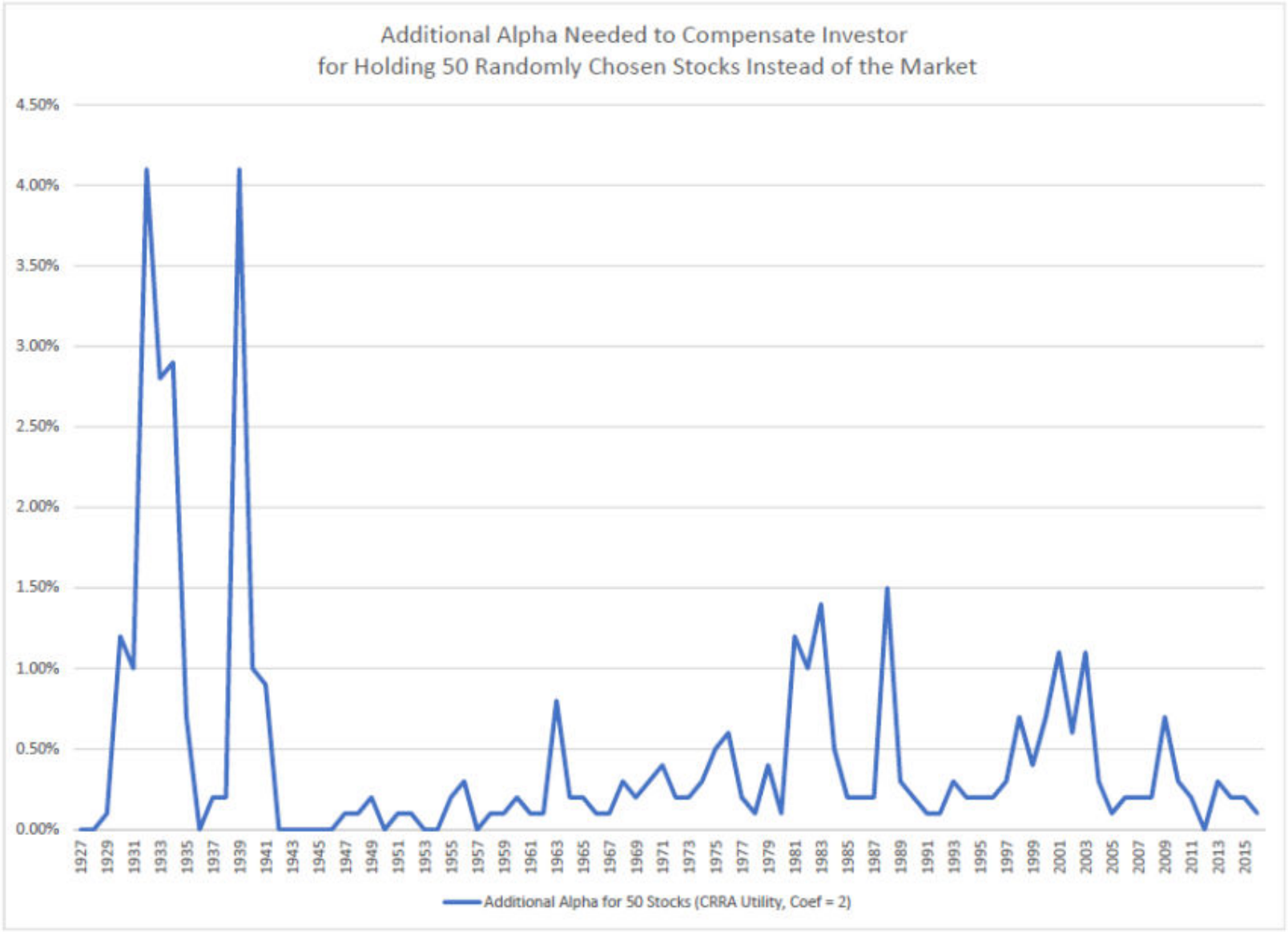
Sophistication Test Proposal

- Test for awareness of 3 potential mistakes regarding:
  - Diversification
  - Exposure (risk-return sustainability)
  - Excess fees

Pop Quiz

- How much alpha would you need to make it worthwhile to invest all of your savings in a single (randomly-chosen) stock?

	Additional Alpha Required
CRRA Coeficient = 1 (Log Utility)	
Regular Period	2.90%
Crisis Period	4.70%
CRRA Coeficient = 2	
Regular Period	6.30%
Crisis Period	9.50%
CRRA Coeficient = 3	
Regular Period	10.40%
Crisis Period	14.30%
CRRA Coeficient = 4	
Regular Period	14.90%
Crisis Period	18.40%


Additional Alpha Needed to Compensate Investor
for Holding 50 Randomly Chosen Stocks Instead of the Market
4.50%
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
1927
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2007
2009
2011
2013
2015
Additional Alpha for 50 Stocks (CRRA Utility, Coef = 2)

Alpha Tradeoffs

- Before taking
  - Underdiversified,
  - High-fee, or
  - Aberrant equity exposure

Conclusions

- ERISA has succeed in giving participants opportunity to diversify systemic risk.
  - But Excess Fees, Dominated Fund, and Investor Diversification, and Exposure losses remain a problem
- Political Economy of reducing fees more difficult than diversification loss because industry resistance
  - Advisors upset if you send letters saying based on 2009 data plan might be paying excessive fees

Dominated Algorithm

- Candidate fund receives less than 1% weight in our computation of the optimal portfolio for the plan
- Candidate fund has fees 50 basis points higher than the mean fees of funds with the same investing style in our sample of 401(k) plans

Methodology

- For each fund, estimate return and standard deviation using a factor model
  - Factor moments estimated over 1980-2000
  - Factor loadings for funds estimated over 2004-2009
  - For each plan, construct a series of Sharpe Ratio-optimal portfolios using the estimated fund moments
  - Global optimum
  - Pre-fee plan optimum
  - Post-fee and expense plan optimum
  - Sharpe ratio of the actual portfolio
- Leverage all optimal portfolios to a single variance
- **Losses can then be expressed as a reduction in the excess return on the global optimum portfolio**

Estimating Plan Moments

$$R_{it} - r_f = \beta_{i1} * (r_{mkt,t} - r_f) + \beta_{i2} * (r_{bond,t} - r_f) + \beta_{i3} * (r_{intl,t} - r_f) + \varepsilon$$

Pre-fee returns: $\mu_p = \beta \mu$

Factor mean return

Post-fee returns: $\mu'_p = \beta \mu - \phi$

Factor mean return less fees

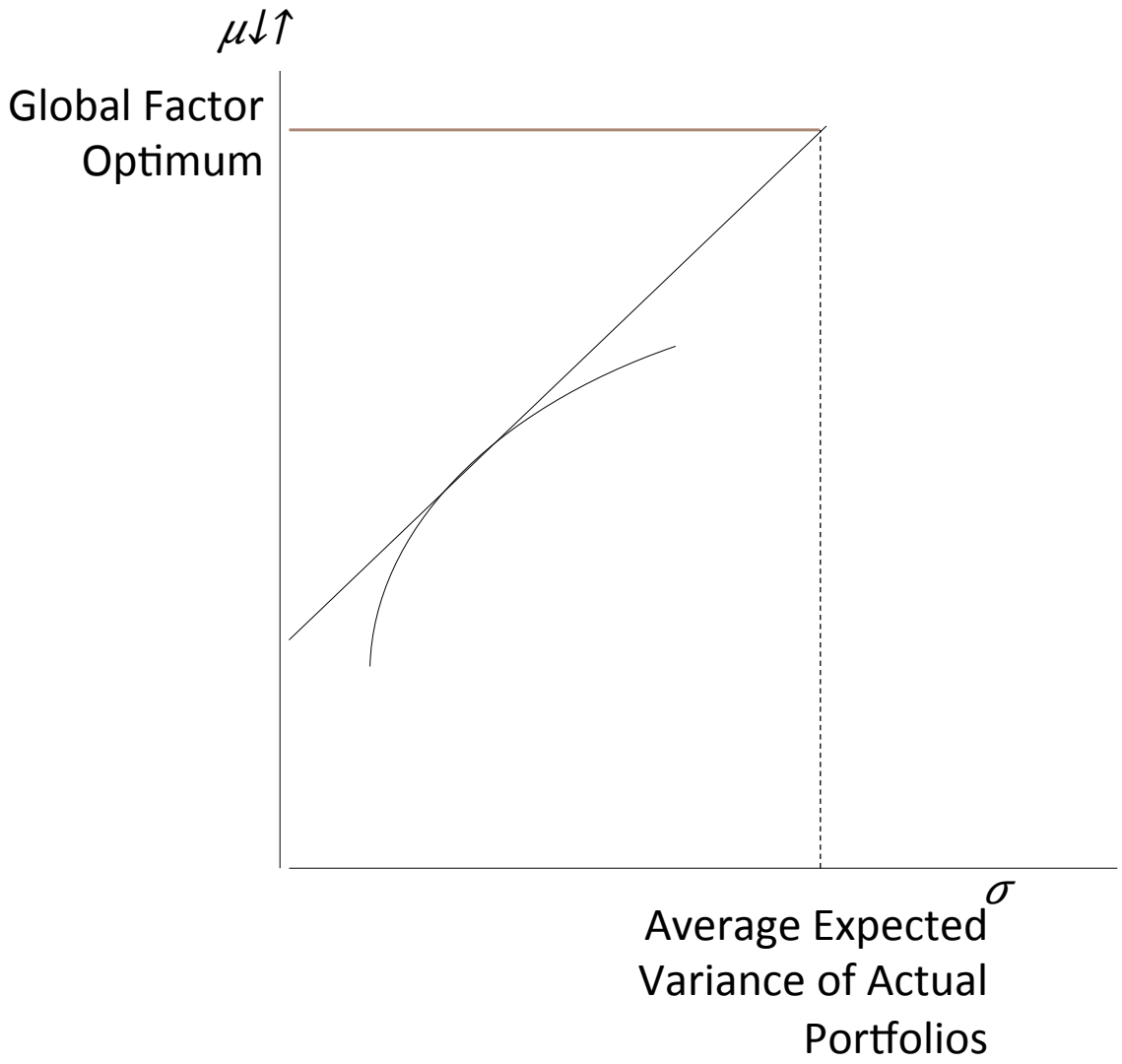
Expected variance: $\Sigma_p = \beta \Sigma \beta + \Sigma_{idio}$

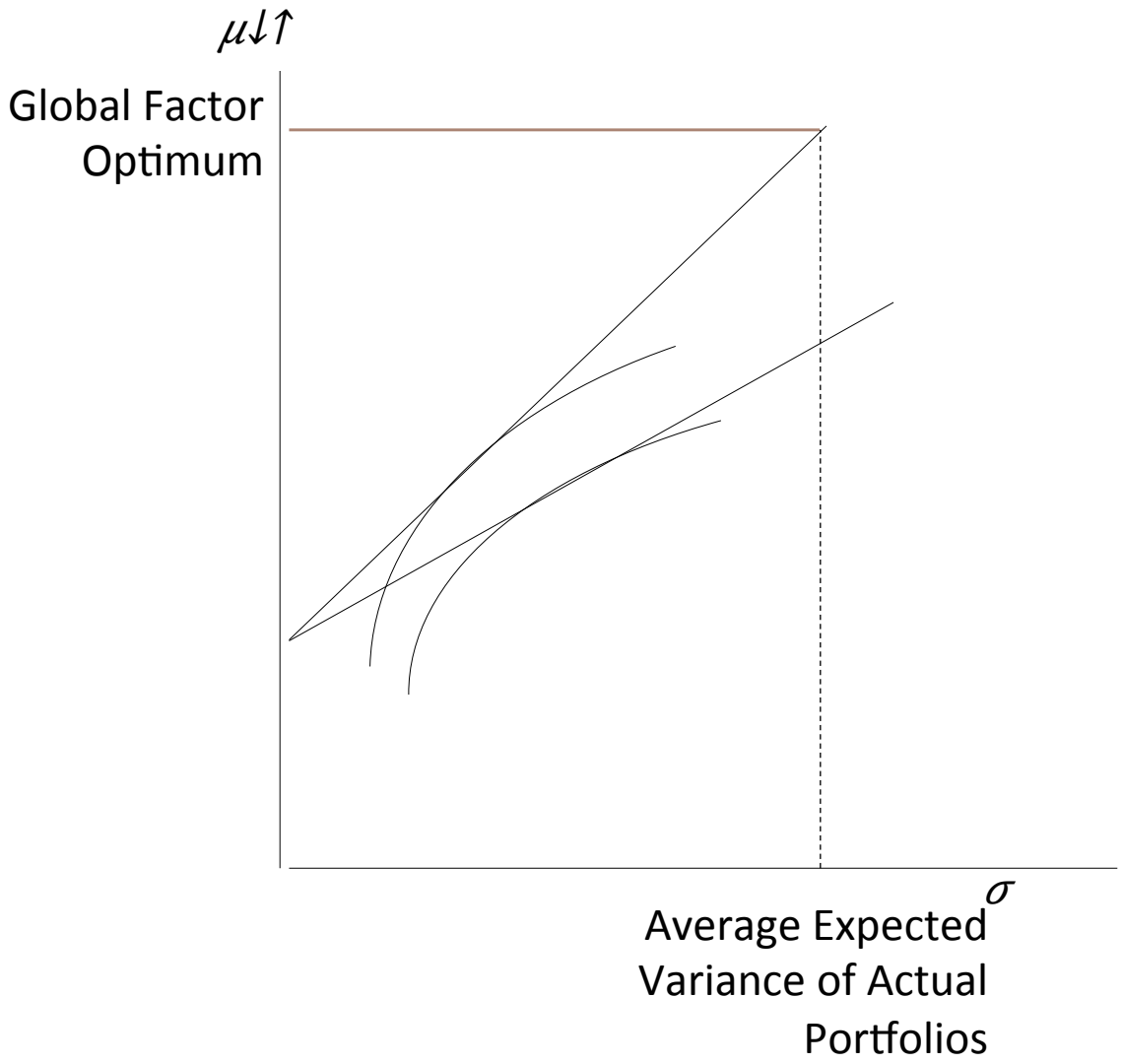
Idiosyncratic risk from residuals

Factor risk

Optimal Sharpe Ratio: $SR(w) = \mu_p / \sqrt{w' \Sigma_p w}$

Short sale restricted


$\mu\downarrow\uparrow$
Global Factor
Optimum
σ
Average Expected
Variance of Actual
Portfolios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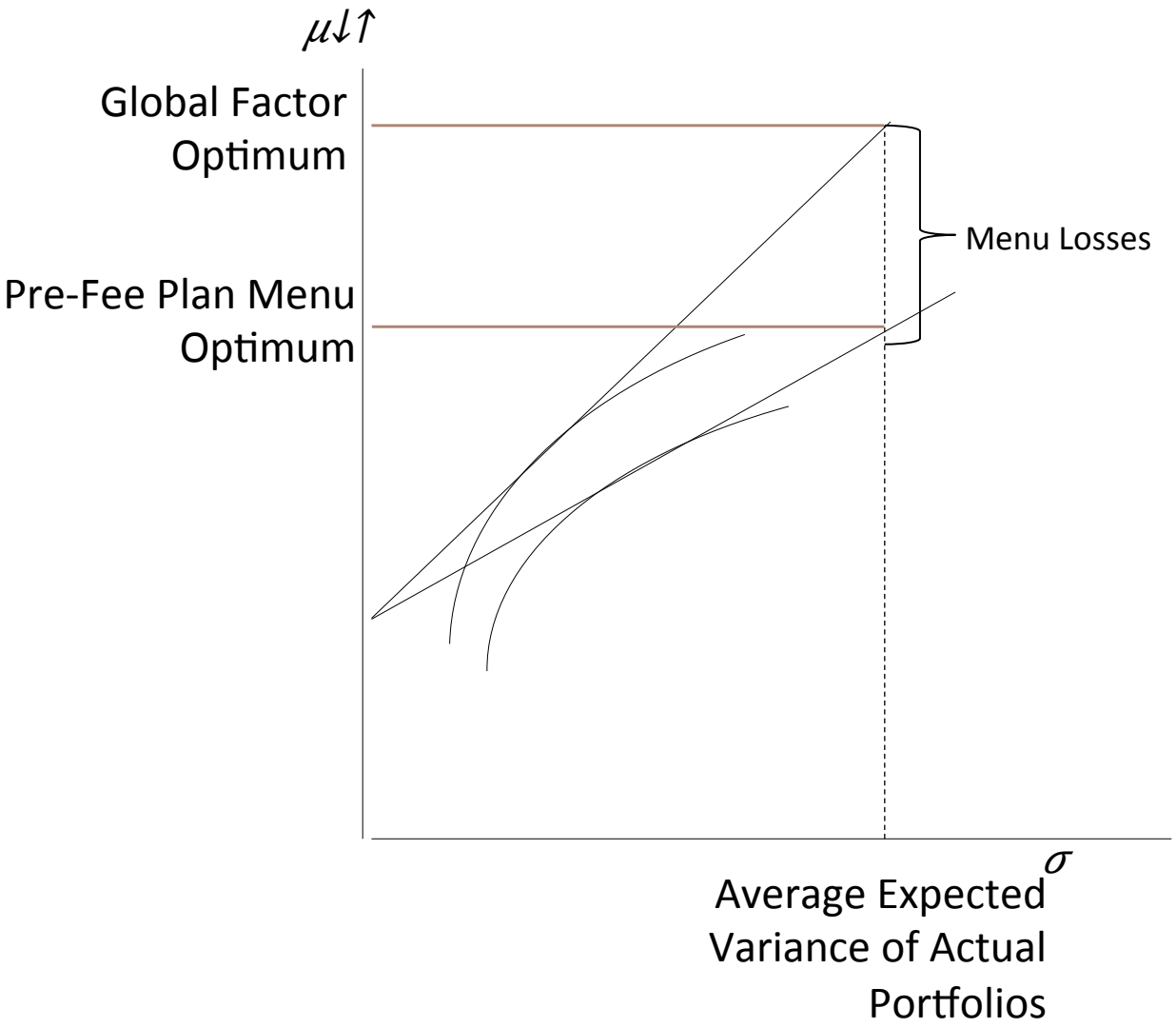
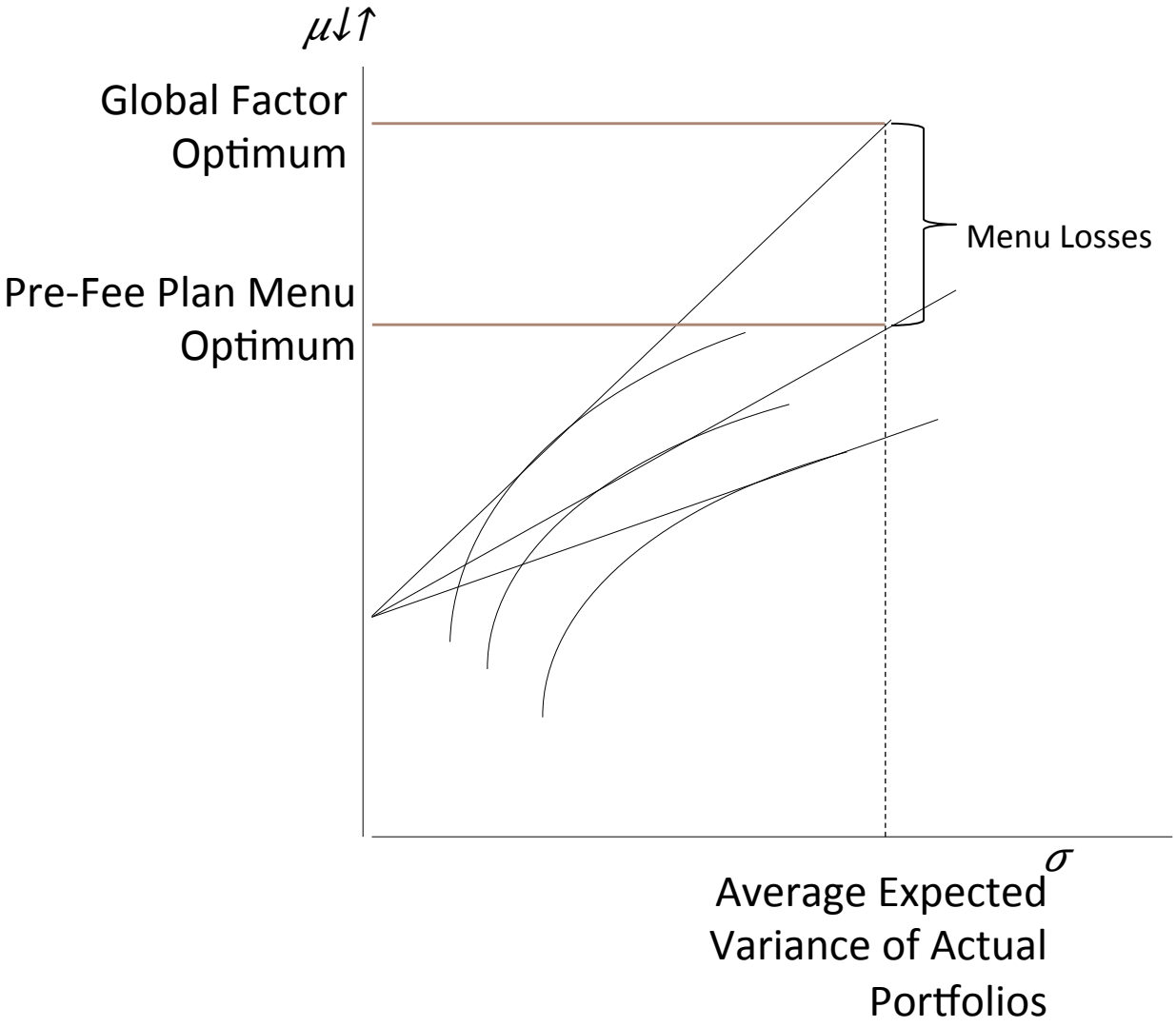

$\mu\downarrow\uparrow$
Global Factor Optimum
Pre-Fee Plan Menu Optimum
Menu Losses
σ
Average Expected Variance of Actual Portfolios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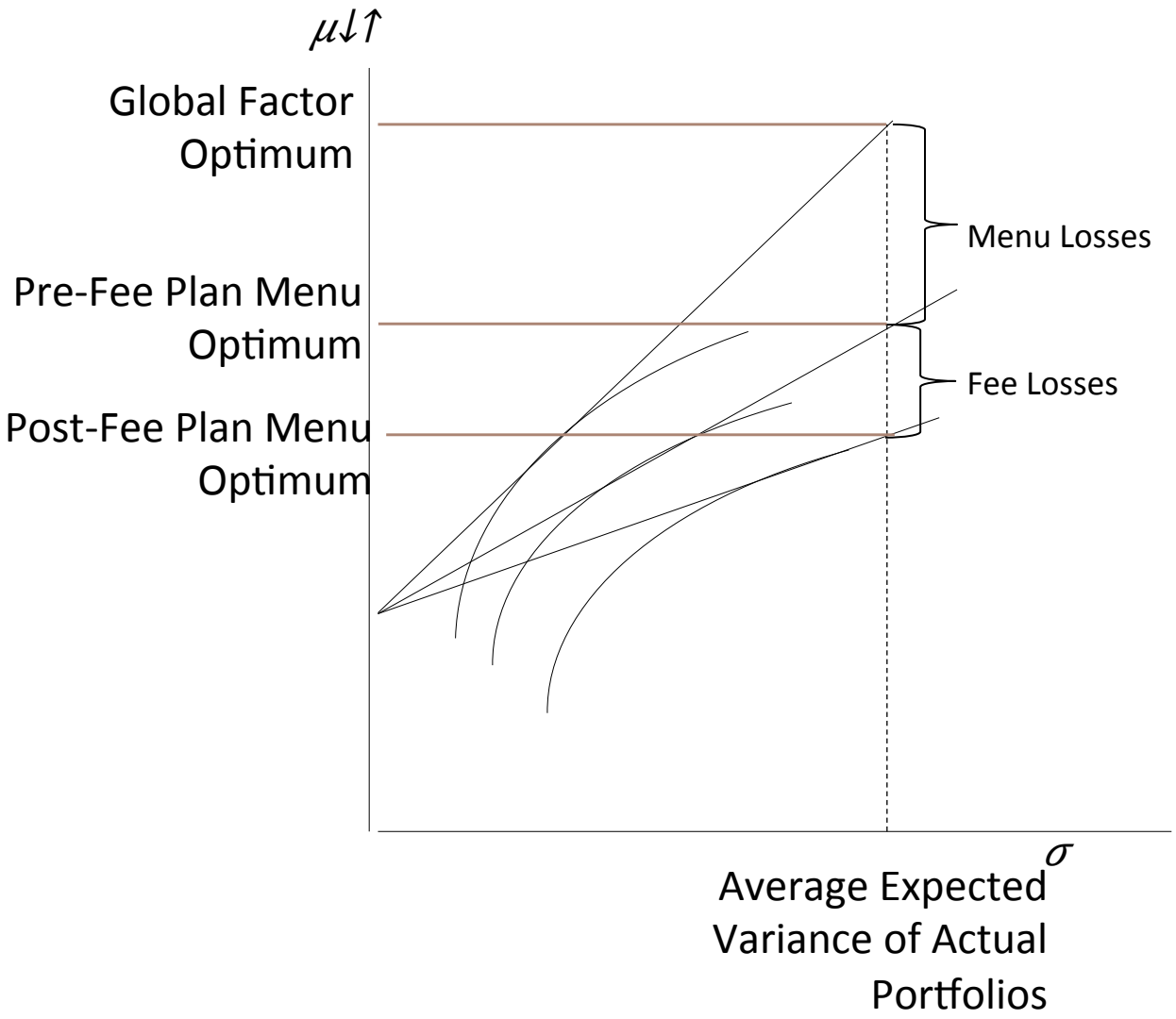
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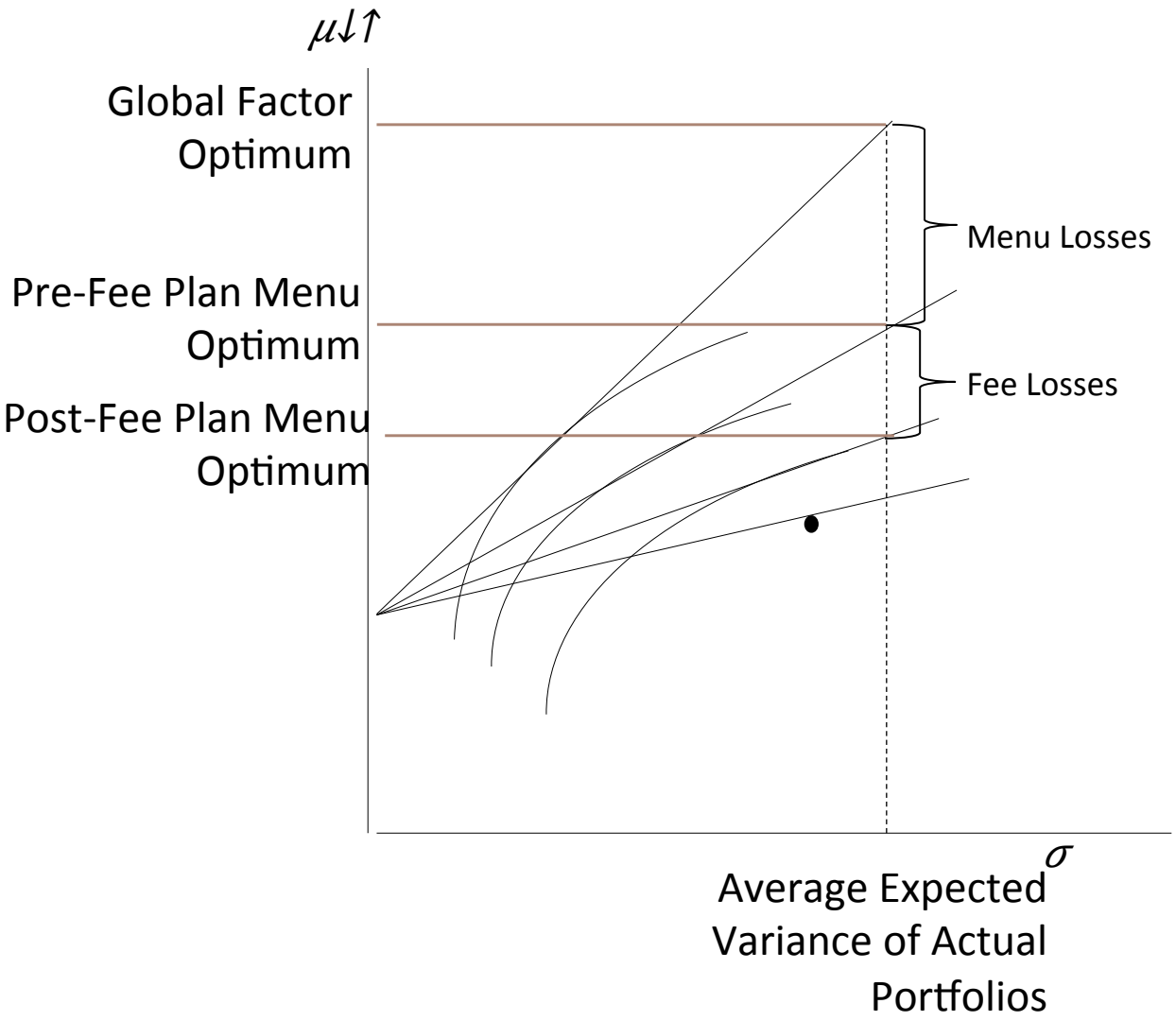
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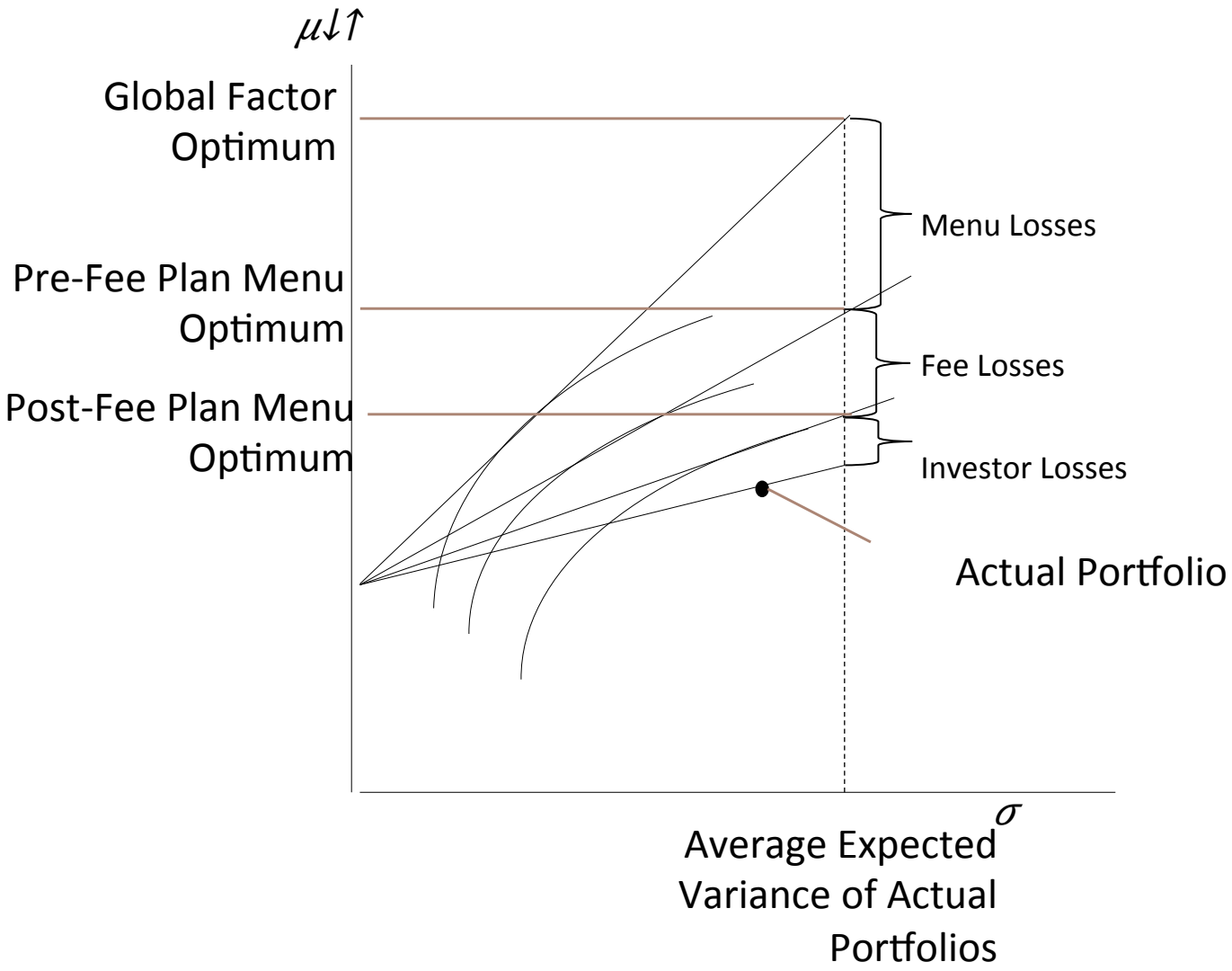
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Investor Losses
Actual Portfolio
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