

# Why do Experienced Hedge Fund Managers have Lower Returns?



Nicole M. Boyson  
Purdue University

June 10, 2003

# Too risky...

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- “If a hedge fund manager is down (significantly) for the year, he’s had a train wreck. Trapped in that kind of situation, a hedge fund will often be tempted to pile on risk.”

*Fortune* (March 17, 2003)

- “These free-wheeling, high-risk investments have federal and state regulators alarmed. This time around, though, the SEC is in the lead.”

*Business Week* (May 8, 2003)

- “Critics (of hedge funds)... stress that there’s a greater chance a manager may take on too much risk and lose it all.”

*USA Today* (February 10, 2003)



... or just right?

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“Hedge fund proponents counter that they’re actually less risky than mutual funds because hedge fund managers make more money when the fund does well and often have a sizable chunk of their own net worth tied up in the fund.”

*USA Today* (February 10, 2003)



# Focus on Relative Risk

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- Difficult to answer question of too much or too little absolute risk, but can examine relative risk-taking:
  - Do managers increase or decrease risk as their careers progress?
  - What drives this behavior?
  - What is the impact on performance?



# Approach

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- Test opposing risk-taking theories with hedge funds
  - Risk-taking should increase over the career
    - Avery and Chevalier [1999]
  - Risk-taking should decrease over the career
    - Prendergast and Stole [1996]
  - Which theory holds for hedge funds?

# Hedge Funds are Unique

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- Low Agency Costs
  - Little incentive to window-dress
  - Incentive fees align objectives
  - Personal money invested
  - Lockup periods reduce cash holdings
  - IMPLICATION → Low incentive to incur too much risk at any point in career

# Hedge Funds are Unique (cont.)

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## □ Unique Career Concerns

- Large salaries that increase with time
- Rare for failed manager to start a new fund
- More to lose – personally – if fund fails
- IMPLICATION → High incentive to reduce risk over the career



# Preview of Results

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1. Experienced managers take on less risk than inexperienced managers
  - ▣ low risk-taking = low volatility strategies and/or more herding behavior
2. Driven by increasing career concerns over time (specifically, fear of failure)
3. This behavior has a negative impact on returns of experienced managers



# Outline

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1. Literature review
2. Data
3. Methodology
4. Conclusion

# Theory: Risk-Taking Increases Over Time

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## □ Theoretical:

- Avery and Chevalier [1999]
  - Over time, managers gain more precise knowledge about own abilities
  - Old will not mimic others
    - More confident/want to showcase ability

## □ Empirical Support:

- Chevalier and Ellison [1999]
- Hong, Kubik, Solomon [2000]
- Lamont [2002]

# Theory: Risk-Taking Decreases Over Time

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## □ Theoretical:

### ■ Prendergast and Stole [1996]

- Managers wish to quickly acquire a reputation for learning
- Young overreact to new information
  - Show they have good information
- Old underreact
  - Do not want to deviate from prior actions

## □ Empirical Support:

- Graham [1999]
- Li [2002]

# Career Concerns Literature

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## □ Fama [1980]

- Even in the presence of incentive contracts, career concerns can resolve agency problems
  - Managers want to keep their jobs, so they behave appropriately

## □ Holmstrom and Ricart i Costa [1986]

- But, sometimes career concerns work too well
  - Resolve some problems but cause others



# Data

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- 982 hedge funds (271 with all characteristics)
- 1994-2000 (84 months)
- At least \$5 million in assets
- At least 24 months of returns
- Includes 285 “dead” funds
- Adjusted for backfilling bias
- Includes returns, manager and fund characteristics

# Table 1: Selected Summary Statistics

Characteristic	Mean	Median
Excess Monthly Return	0.85%	0.66%
Manager Tenure	6.77 years	6.01 years
Manager Age (small sample)	47 years	44 years
Management Fee	1.30%	1.00%
Incentive Fee	17.79%	20.00%
Personal Capital Invested?	67%	-
Uses Leverage	72%	-
Fund Size	\$113 million	\$30 million

# 3 Measures of Risk-Taking Behavior

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- Independent of market or “beta” risk

## Three measures

1. Standard deviation of returns
2. Fund-of-funds tracking error deviation
3. Fund-of-funds beta deviation
  - 2 and 3 are herding measures
  - more herding implies less risk

# How Does Risk-Taking Behavior Vary With Career Concerns?

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## □ Non-Parametric tests

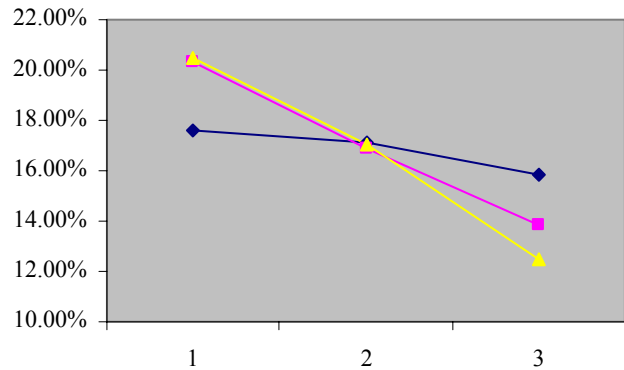
- Split sample into thirds by manager tenure
- Comparison of means
- Also sort by fund size and size/tenure interaction
- Table 3, Figures 1 and 2

## □ Parametric tests

- Table 4
- Regress risk-taking measures against tenure, fund characteristics, and controls for market risk

# Figure 1

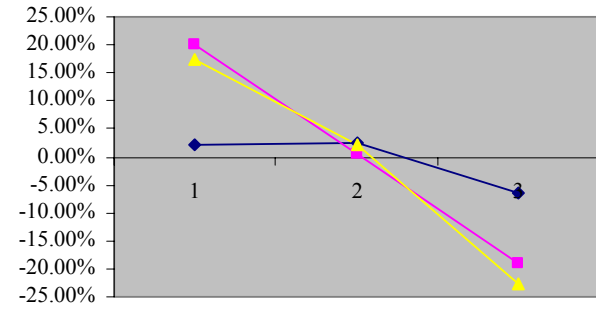
### Standard Deviation



Age, Size, or Age/Size Category (Smallest to Largest)

◆ STD by age    ■ STD by size    ▲ STD by age/size

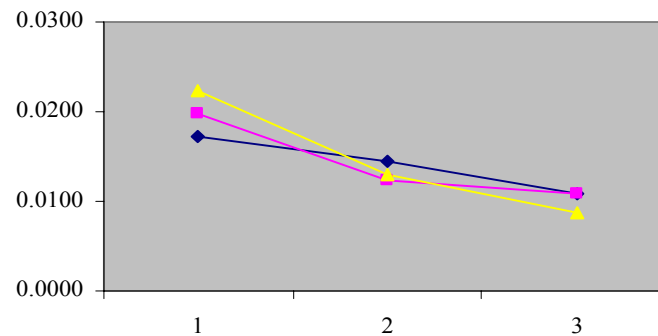
### FOF Tracking Error Deviation



Age, Size, or Age/Size Category (Smallest to Largest)

◆ TE by age    ■ TE by size    ▲ TE by age/size

### FOF Beta Deviation

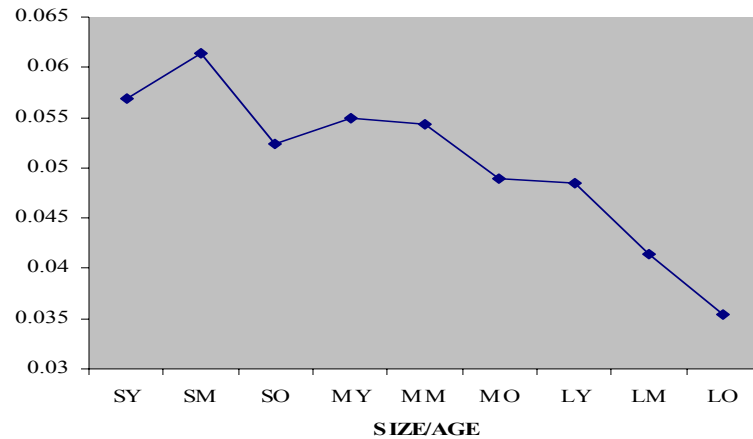


Age, Size, or Age/Size Category (Smallest to Largest)

◆ BDEV by age    ■ BDEV by size    ▲ BDEV by age/size

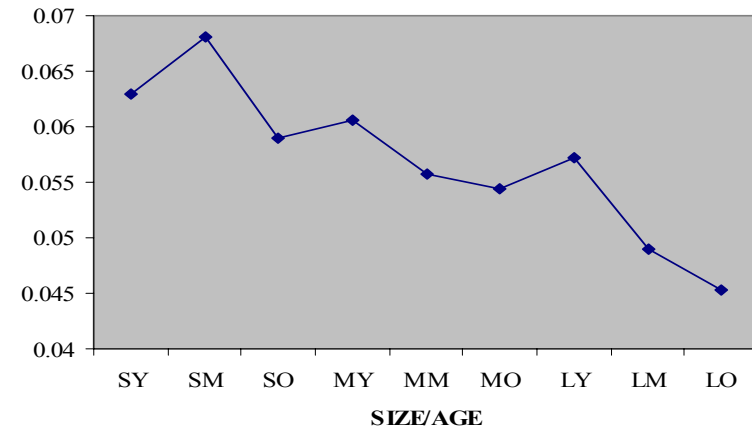
# Figure 2 (Risk by Age/Size)

**STANDARD DEVIATION BY SIZE/AGE**



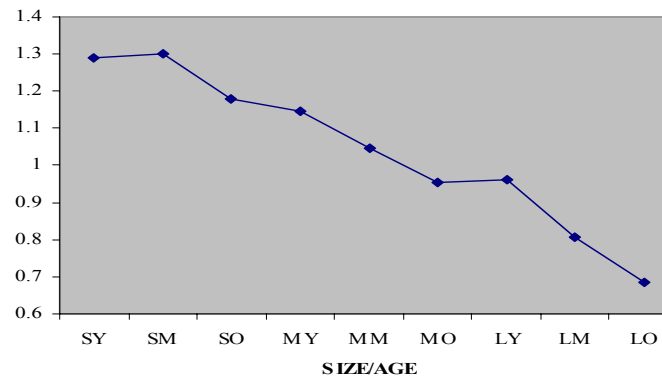
—◆— Standard Deviation

**FOF TRACKING ERROR DEVIATION BY SIZE/AGE**



—◆— Tracking Error

**FOF BETA DEVIATION BY SIZE/AGE**



—◆— Beta Deviation

# Why Less Risk?

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- Fear of failure?
  - Risk/failure relationship
  - Age/failure relationship
  
- If risk leads to failure, one reason experienced may take on less risk is fear of failure
  
- Use proportional hazards model to examine relationship

# Survival Analysis – Methodology

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- A time-varying proportional hazards model is estimated
  - Conditional, rather than absolute, probabilities are calculated
    - Important for reputational hypotheses – survival is conditional on having survived earlier periods
  - Allows for complete use of the time-series variation in the sample
    - Time-series data on manager age and tenure may be used
    - Average life of hedge fund is short, so precise measures of age and tenure are relevant to understand survival relationship

# Time-Varying Proportional Hazards Model

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- Estimate relationship between the hazard rate,  $\lambda(t)$ , and a number of explanatory variables,  $z(t)$ , that can vary over time
- These explanatory variables shift an underlying baseline hazard function,  $\lambda_0(t)$ , up and down
  - Baseline hazard can follow any distribution (like exponential or Weibull) for which proportionality holds, and need not be specified to estimate the model
  - The function is described by the following equation where  $\beta$  is the set of coefficients to be estimated:

$$\lambda(t; z(t)) = \lambda_0(t)e^{\beta z(t)}$$

# Time-Varying Proportional Hazards Model – Assumptions

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- Assume sample of  $n$  hedge funds
- $k$  funds fail during the sample period
- Failure times  $t_1 < t_2 < \dots < t_k$ .
- The remaining  $n-k$  funds are censored and have no failure times.
- Let  $\delta_i = 1$  if a fund in period  $i$  fails and zero if it does not.
- Let  $z_i(t)$  be  $z(t)$  for the fund with failure time  $t(i)$
- Let  $z_j(t)$  be  $z(t)$  for each fund at risk at time  $t(i)$ .
- Let  $R_i$  be the set of funds at risk of failure in period  $i$ .

# Time-Varying Proportional Hazards Model – Partial Likelihood Function

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- $\beta$  can be estimated by maximizing the partial likelihood function (below) of the probability of failure observed in the sample [Cox (1972)]

$$L(\beta) = \prod_{i=1}^n \left[ \frac{e^{\beta z_i(t_i)}}{\sum_{j \in R_i} e^{\beta z_j(t_i)}} \right]^{\delta_i}$$

- For each fund that fails, its variables are compared to the funds that survived

## Table 5: Risk and Survival\*

Variable	Risk Measure 1	Risk Measure 2	Risk Measure 3
Standard Deviation	<b>2.605</b> <b>(0.03)</b>		
T.E. Deviation		<b>4.555</b> <b>(0.02)</b>	
Beta Deviation			<b>0.141</b> <b>(&lt;.001)</b>

\*A positive coefficient indicates a positive relationship with failure. P-values from a chi-squared test are shown in parentheses.



# Experience and Survival

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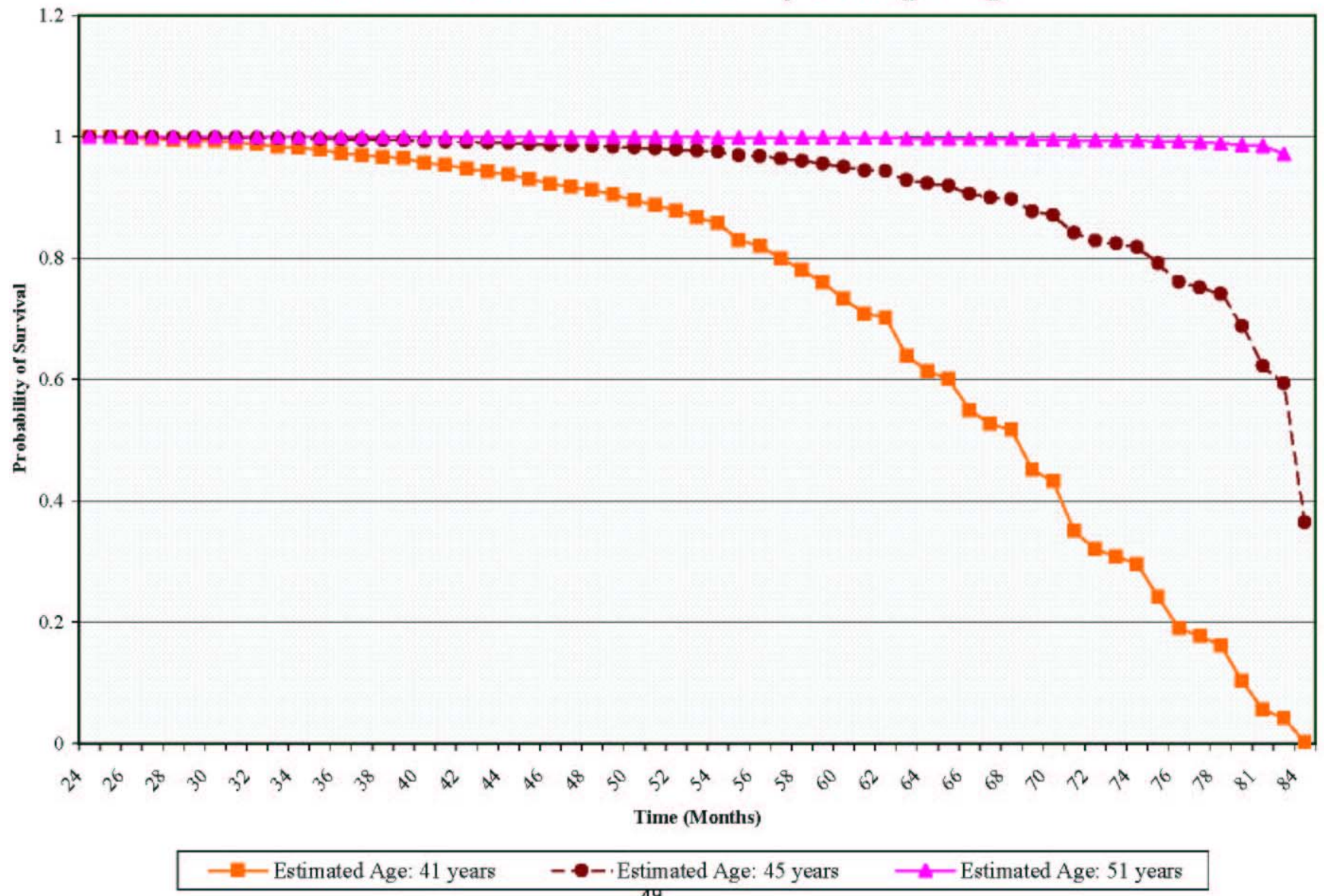
- Risk-taking behavior increases the likelihood of failure
- If managers are reducing risk over time to increase the probability of survival, it should be that older managers have a higher probability of survival
- Robustness check: Size as a measure of reputation

Table 5: Experience (and Size) and Survival\*

<b>Variable</b>	<b>Manager Tenure</b>	<b>Size</b>	<b>Tenure x Size</b>
Manager Tenure	-0.060 ( $<0.001$ )		
Size		-0.529 ( $<0.001$ )	
Tenure*Size			-0.005 ( $<0.001$ )

\*A negative coefficient indicates a negative relationship with failure. P-values from a chi-squared test are shown in parentheses.

**Figure 3**  
**Estimated Survivor Functions by Manager Age**





# Returns and Experience

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- Does risk-aversion of experienced managers affect their returns?
- Prior research
  - (Liang [1999], Edwards and Caglayan [2001])
  - Negative relationship between experience and returns
    - Possible explanation: reduced risk-taking behavior

# Controlling for Market Risk

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- Fama-Macbeth [1973] approach
  - Form portfolios (sorting on index exposure and size)
  - Use coefficients from portfolio regressions as controls for market exposure

## Three Measures

- Excess of risk-free rate
- Adjusted for passive exposure, four factors, and option returns
- Adjusted for hedge fund exposure

## Table 6 (Selected Results)

	Excess Returns	Passive Index- Adjusted	Hedge Fund Index Adjusted
Manager Tenure	<b>-0.009</b> <b>(-5.44)</b>	<b>-0.007</b> <b>(-6.66)</b>	<b>-0.007</b> <b>(-7.35)</b>
Onshore	<b>0.021</b> <b>(2.13)</b>	<b>0.018</b> <b>(2.44)</b>	<b>0.024</b> <b>(2.87)</b>
Incentive Fee	0.111 <i>(1.59)</i>	<b>0.112</b> <b>(2.78)</b>	<b>0.113</b> <b>(2.59)</b>
US Style	<b>0.103</b> <b>(3.02)</b>	<b>0.092</b> <b>(3.62)</b>	<b>0.094</b> <b>(3.93)</b>
Relative Value Style	0.008 <i>(0.33)</i>	<b>0.032</b> <b>(2.53)</b>	<b>0.027</b> <b>(2.46)</b>
Event Driven Style	0.034 <i>(1.63)</i>	<b>0.049</b> <b>(2.70)</b>	<b>0.044</b> <b>(2.89)</b>
Adjusted R- Squared	0.074	0.282	0.240



# Implications

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- More experienced managers have lower returns
  - Even when controlling for market risk
  - Market risk exposure does not vary with tenure
- Is this result driven by risk-taking behavior?
  - Volatility and herding measures



# Relationship Between Returns, Tenure, and Risk-Taking Behavior

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- Do differences in risk-taking behavior drive differences in returns?
  1. Risk-taking behavior and returns
  2. Relationship between risk-taking measures, manager tenure, and returns

## Table 7 (Using H.F. Market Controls)

Specification	No Risk Variables	Standard Deviation	FOF Tracking Error Deviation	FOF Beta Deviation
Manager Tenure	<b>-0.007</b> <b>(-9.63)</b>	<b>-0.004</b> <b>(-4.64)</b>	<b>-0.004</b> <b>(-3.95)</b>	<b>-0.004</b> <b>(-2.53)</b>
Standard Deviation		1.038 <i>(1.93)</i>		
Tr. Error Deviation			<b>0.361</b> <b>(2.73)</b>	
Beta Deviation				<b>0.022</b> <b>(2.41)</b>
Adjusted R-squared	0.262	0.285	0.263	0.274



## Table 7: Results

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- Risk-taking behavior is positively related to returns
- Risk-taking behavior explains about half of the difference in returns between experienced and inexperienced managers
  - Not explained by “market” risk



# Conclusion

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- More experienced managers take on less risk than less experienced managers
- Likely due to career concerns: more experienced manager have more to lose
- Risk-taking behavior partially explains differences in returns among experienced and inexperienced managers

# Implications

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## 1. Fund selection and investor welfare

- Individuals, institutions, funds of funds
- Is there an optimal time to buy a fund?

## 2. Incentive contract design

- Asymmetric fees not always the best?
- Encourage deviation from benchmarks
  - Carpenter, Dybvig, and Farnsworth [2001]