Unexploited Gains from International Diversification

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Presentation

1. Motivation

2. Data

3. How Do MFs Allocate Their Portfolios Globally?

4. What Factors Might Explain Global Portfolios?

5. Do Returns and Investment Strategies Matter?

6. Conclusions

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1. Motivation: What We Do

- Globalization has increased sharply

  - Potential gains from diversification

  - Supply side: investors gain

  - Demand side: government and firms benefit

  - Still, scarce evidence

- In this paper

  - Look at nice micro data and conduct "experiment"

  - Shed light on global portfolios and extent of international diversification of mutual funds (supply side)

  - Explore causes of diversification level and costs

1. Motivation: Main Results

- Increasing flexibility to invest across countries and regions (expansion of global funds)

- However, MFs invest in a very restrictive manner

  - Hold few stocks and forgoe diversification gains

- Not explained by

  - Lack of available instruments

  - Lack of information

  - Transaction costs

  - Better ability of global funds to minimize tail risk

- Partly driven by mutual fund family effects

1. Motivation: Advantage in Studying MFs

- Testing potential for theories of diversification
  - Different types of funds within same family
    - Global funds vs specialized funds
    - Large industry shift toward global funds
  - Holding a stock
    - Available for trading
    - Desirable, at least by other managers within family
    - Information available and already collected (in house)
  - Test of asymmetric information and transaction costs
  - Test other factors that can affect diversification

1. Motivation: Advantage in Studying MFs

- US MFs important
  - Very large
    - In 2005: 8,000 funds, $8 trillion mkt cap, 69% US GDP
  - Strong international presence
    - Hold more than 70% of world MF assets
  - Hold 24% of retirement savings
  - Relatively sophisticated investors
- Data available to construct portfolios

1. Motivation: Object of Study

- Unique micro data: Actual portfolios of institutions

- U.S. mutual funds (MFs)

  - Universe of funds

  - Funds meant to invest globally

- Data we assemble

  - Construct asset-level portfolios

  - Trace portfolios since inception

  - Collect return information

1. Motivation: Paper Organization

- Degree of MF international diversification

  - Industry shift across fund types

  - Number of MF holdings (stocks, countries) by fund type

- Reasons behind extent of diversification

  - Capital market constraints

  - Information asymmetry

- Returns to being diversified

  - Global funds vs. portfolio of diversified funds

1. Motivation: Contribution to literature

+ **International diversification**

  - Home bias

  - Country portfolios

  - Asset-level portofolios

+ **Incentive misalignments: agency conflict**

+ **Institutional investors' investment patterns**

  - Momentum trading

  - Herding

  - Stock-picking

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2. Data: Holding Data

- Asset-level annual portfolios
- 1991 to 2005
- Total of 499 fund families
- 1,904 funds
- Cover most of the U.S. mutual fund industry
- Only on those investing internationally
- 8,420 fund-year observations
- 1,359,750 asset-level holdings, all funds all years
- Corresponding country of each stock identified

2. Data: Return Data

- Fund-level returns

- Daily frequency

- September 1989 to June 2006

- 36 largest fund families

- 371 funds

- 722,885 daily observations

2. Data: Coverage

Holdings Data	
Sample	1991-2005
Frequency	Annual
No. of Families	499
Total Number of Funds	1,904

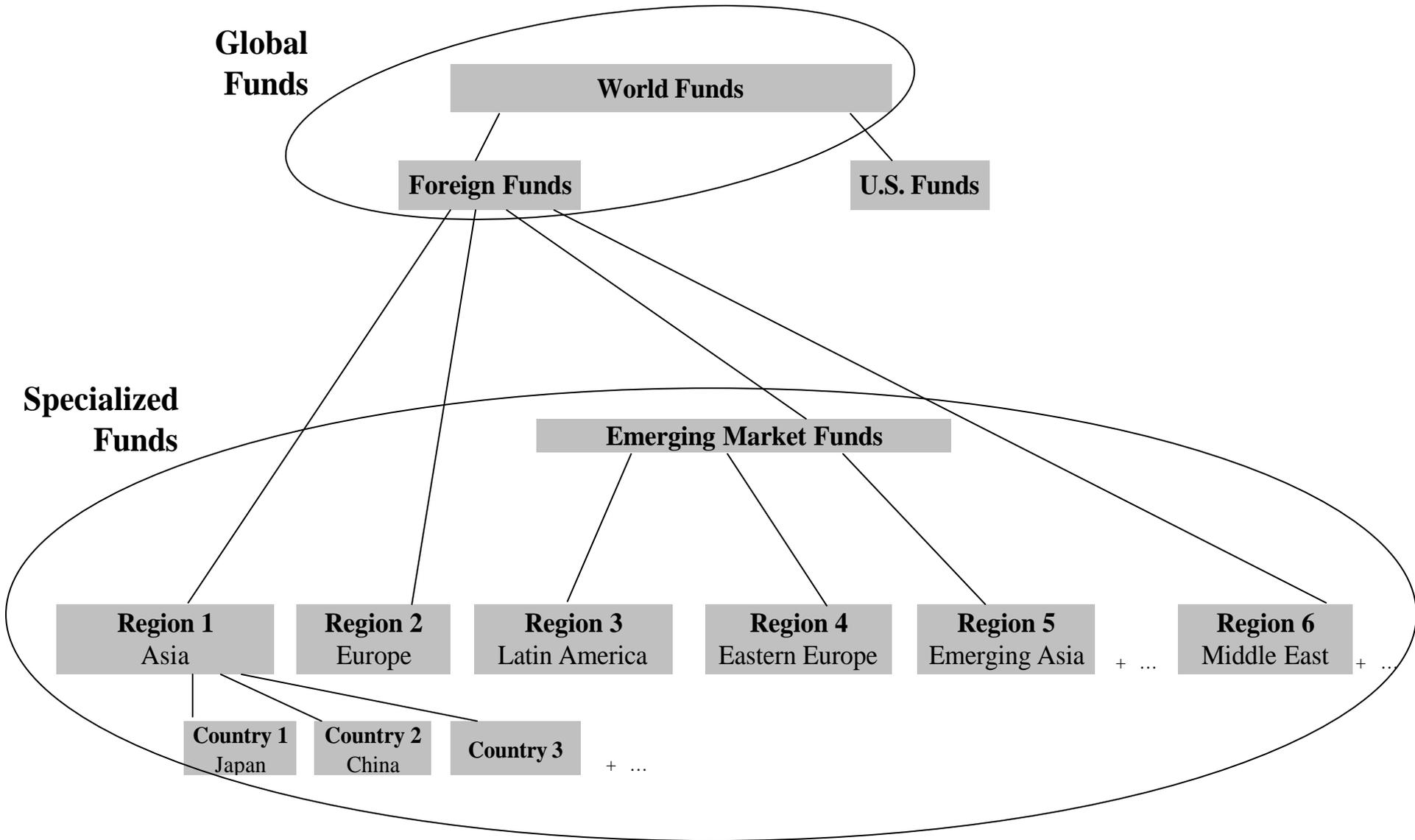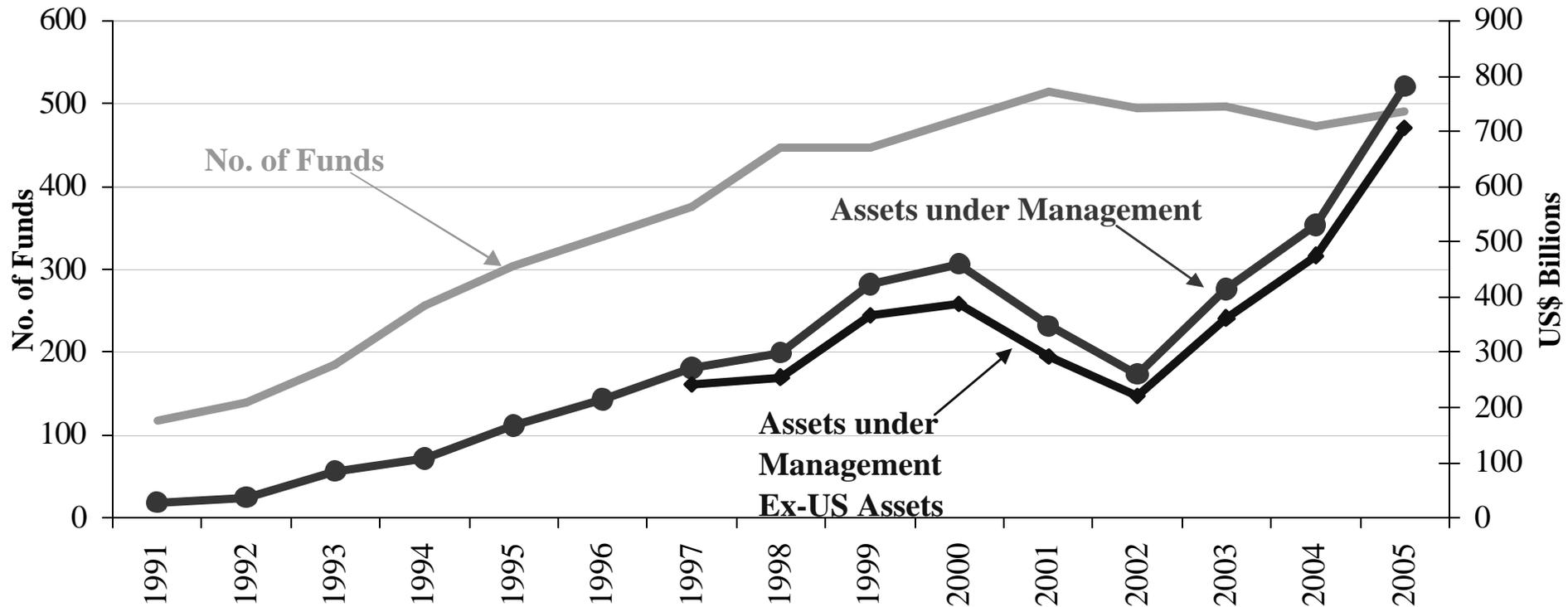| Price Data	
Sample	September 1989 - June 2006
Frequency	Daily
No. of Families	36
Total Number of Funds	371

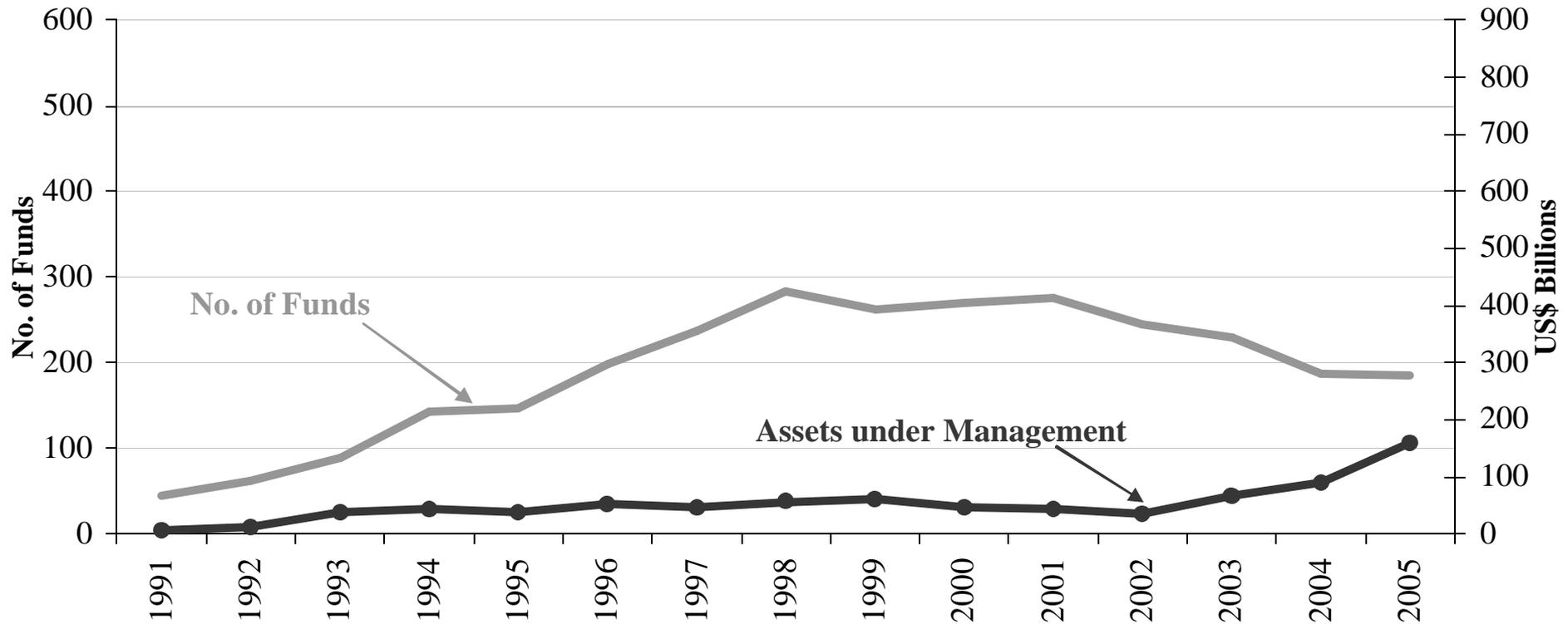# 2. Data: Structure of the US MF Industry

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3. Size of US MFs: Global Funds

3. Size of US MFs: Specialized Funds

3. MF Holdings

Number of Mutual Fund Holdings

	Average	Median	Std. Dev.
Fund Type:			
Global Funds	155	96	196
World Funds	136		132
Excluding U.S. Assets	101	76	100
Foreign Funds	175		219
Specialized Funds	117	79	136
Emerging Market Funds	161		138
Asia Funds	89		110
Europe Funds	111		158
Latin America Funds	58		24
Country Funds	126		178
Total	150	95	186
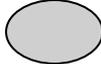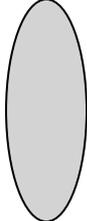
3. MF Holdings

Median Number of Holdings by Fund Type
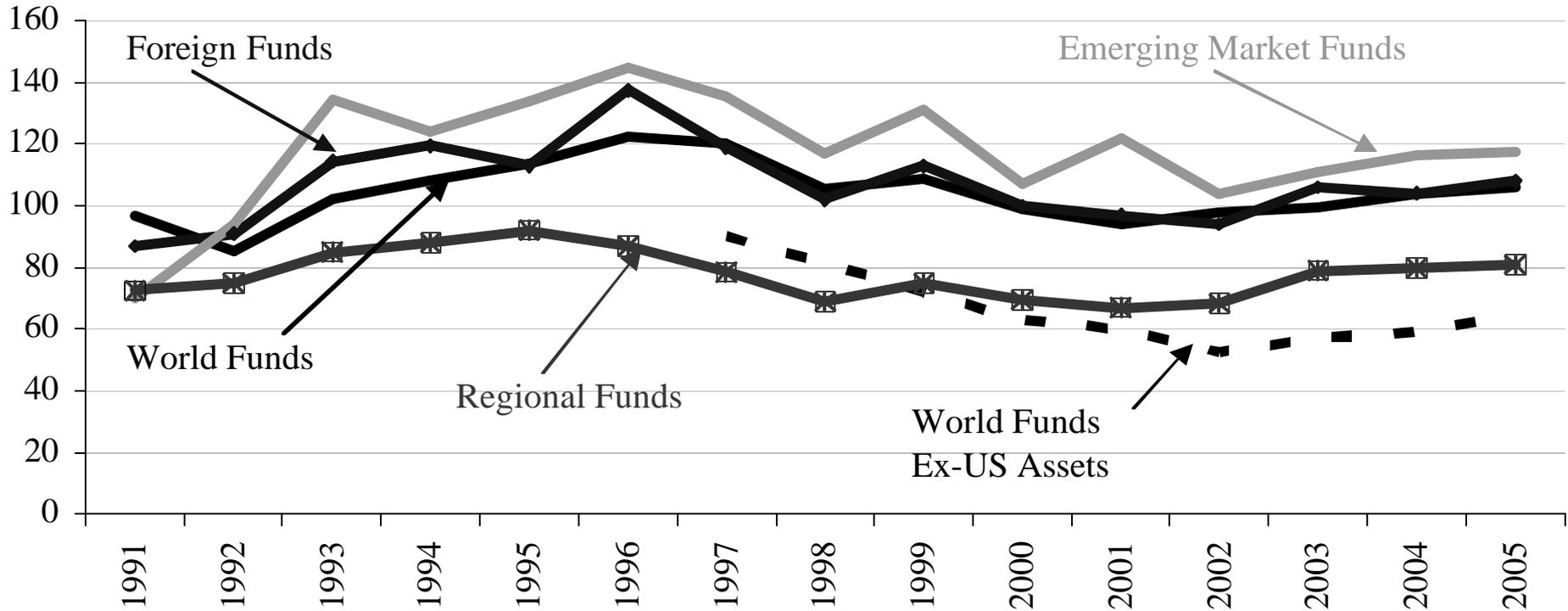
3. MF Holdings: Specialized Funds

Median Number of Holdings by Fund Type
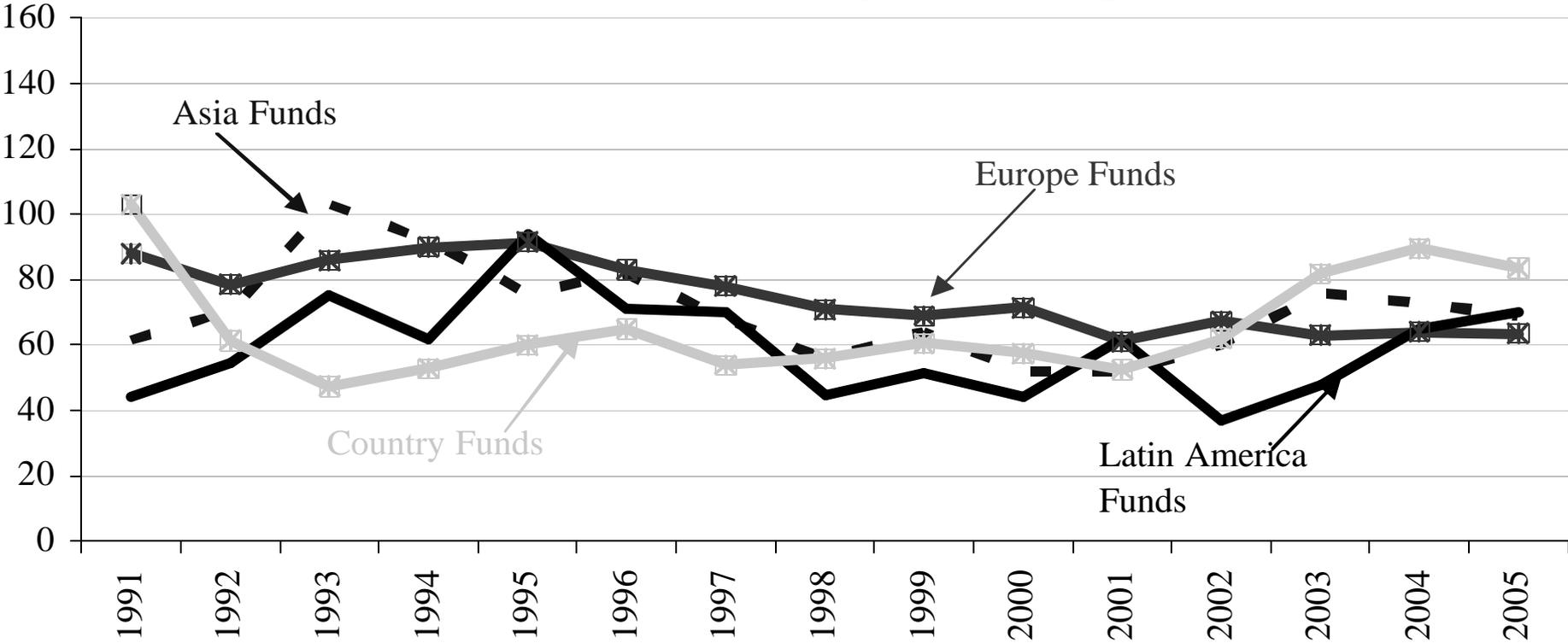
3. Differences in Holdings Within Families

	No. of Assets		
Fund Type	**Latin America**	**Asia**	**Developed Europe**
Regional Funds			
Median No. of Holdings	41	60	62
Changes Relative to:			
Emerging Market Funds	-34%	-33%	-
Foreign Funds	-93%	-42%	-5%
World Funds	-94%	-69%	-49%

3. Differences in Holdings Within Families

No. of Countries

Fund Type	Latin America	Asia	Developed Europe
Regional Funds			
Median No. of Holdings	6	8	12
Changes Relative to:			
Emerging Market Funds	-17%	-10%	-
Foreign Funds	-72%	-30%	0%
World Funds	-75%	-36%	-14%

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4. Instrument Availability

	No. Listed Companies	All Fund Holdings		Global Fund Holdings	
		No. of Holdings	As a Percentage of All Listed Stocks	No. of Holdings	As a Percentage of All Listed Stocks
1997					
Total		9,086		6,267	
Developed Countries	12,987	6,815		4,953	
Emerging Countries	17,332	2,271		1,314	
2004					
Total	39,061	6,289	16%	5,510	14%
Developed Countries	18,282	5,204		4,799	
Emerging Countries	20,779	1,085		711	
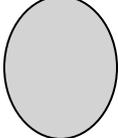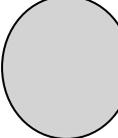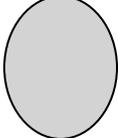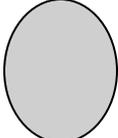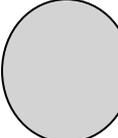
4. Instrument Availability

	No. Listed Companies	**All Fund Holdings**		**Global Fund Holdings**	
		No. of Holdings	**As a Percentage of All Listed Stocks**	**No. of Holdings**	**As a Percentage of All Listed Stocks**
Total	39,061	6,289	16%	5,510	14%
Developed Countries	18,282	5,204	28%	4,799	26%
Asia	7,758	2,748	35%	2,429	31%
Europe	9,817	2,392	24%	2,315	24%
Middle East	686	45	7%	37	5%
Emerging Countries	20,779	1,085	5%	711	3%
Asia	10,444	566	5%	394	4%
Europe	6,279	184	3%	114	2%
Latin America	1,525	195	13%	141	9%
Middle East & Africa	2,531	140	6%	62	2%

2004

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4. Instrument Availability

	Holdings as a Percentage of Firms' Market Capitalization			Average Mutual Fund Size
	Average	Median	Std. Dev.	(U$S Million)
Fund Type:				
Global Funds	0.12%		0.75%	899
World Funds	0.18%	0.01%	0.86%	1,320
Foreign Funds	0.11%	0.01%	0.72%	758
Specialized Funds	0.12%		0.59%	277
Emerging Market Funds	0.15%	0.02%	0.70%	369
Asia Funds	0.12%	0.01%	0.53%	132
Europe Funds	0.08%	0.01%	0.35%	346
Latin America Funds	0.10%	0.02%	0.47%	144

4. Instrument Availability

Mutual Fund Holdings as a Proportion of the Total No. of Listed Stocks

First Quintile

Average: 1.1%
Max: 2.4%

Second Quintile

Average: 7.7%
Max: 13.8%

Third Quintile

Average: 21.1%
Max: 28.2%

Fourth Quintile

Average: 35.2%
Max: 43.6%

Fifth Quintile

Average: 57.8%
Max: 77.3%
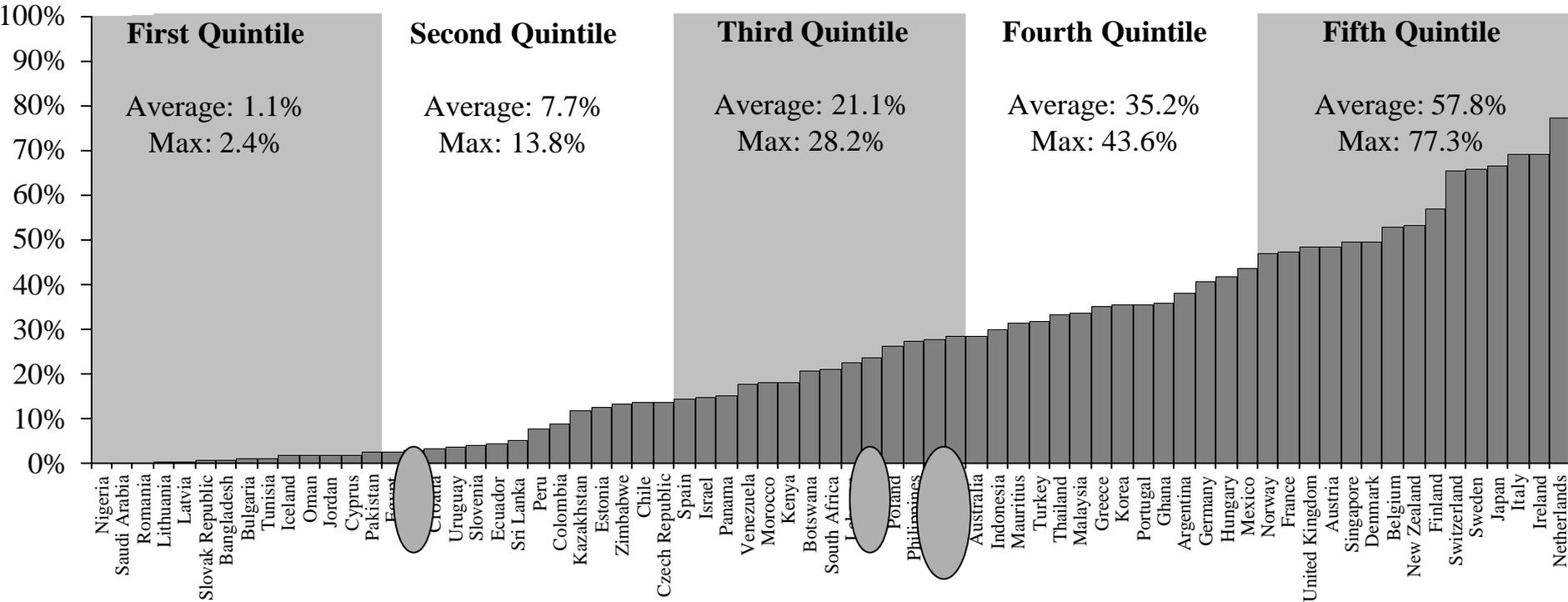
4. Information Sharing

Probability of Being Held by a Mutual Fund

		Global Funds Probability of:		Total
		Not Being Held	Being Held	
Specialized Funds Probability of:	Not Being Held	0%	25%	25%
	Being Held	32%		48%
No Specialized Fund		0%	27%	27%
Total		32%	68%	100% [396,388]
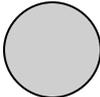
4. Information Sharing

Probability of Being Held by a Mutual Fund

Holdings in Emerging Countries Only

		Global Funds Probability of:		Total
		Not Being Held	Being Held	
Specialized Funds Probability of:	Not Being Held	0%	10%	10%
	Being Held			89%
No Specialized Fund		0%	2%	2%
Total		75%	25%	100% [92,175]

4. Information Sharing

🔸 Entropy measure constructed as follows:

$$Entropy_{f,t} = \frac{\displaystyle\sum_{s,i} NAV_{s,i,f,t} + \sum_{s,j} NAV_{s,j,f,t}}{\displaystyle\sum_{i} NAV_{i,f,t} + \sum_{j} NAV_{j,f,t}},$$

4. Information Sharing

Evolution of Entropy Measure
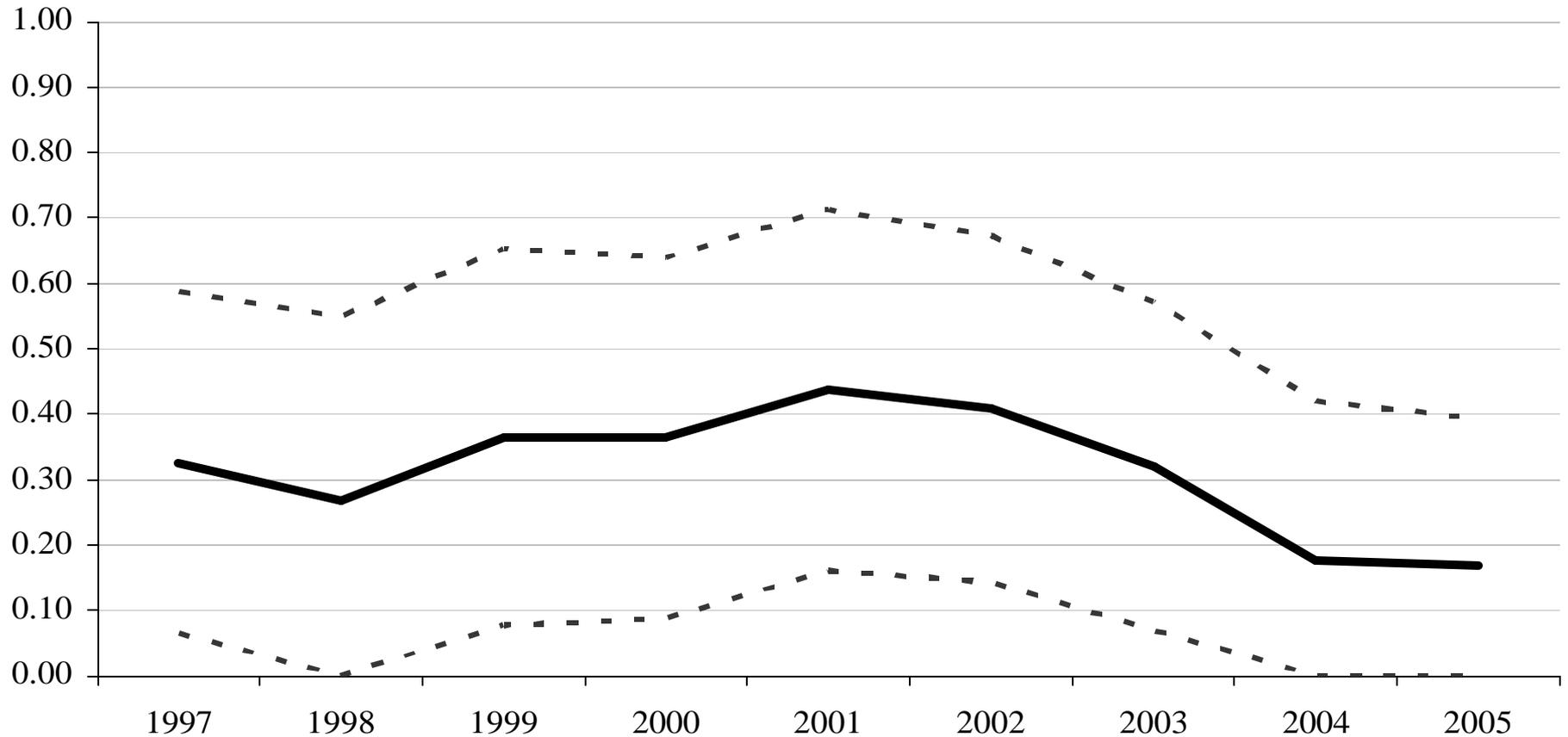
4. Information Sharing

Evolution of Entropy Measure
Holdings in Emerging Countries Only
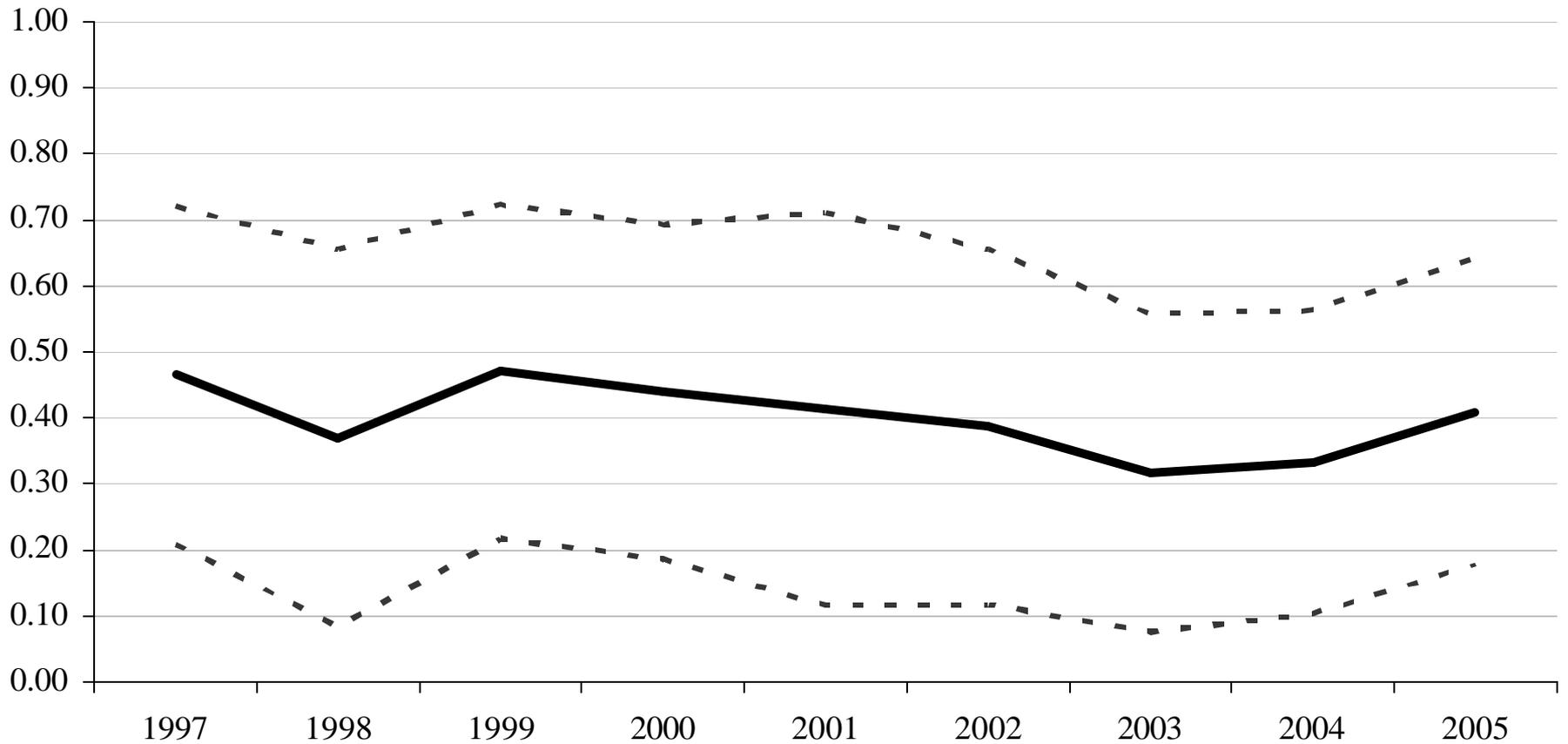
4. Information Processing

No. Of Holdings: Importance of Number of Managers

Independent Variables:

No. of Managers

1	
	[10.796]
2	
	[8.694]
3	153.644***
	[19.300]
4	166.163***
	[20.096]
5	152.236***
	[16.559]
6	
	[31.306]
7 or More	221.734***
	[28.132]
No. of Observations	6,321
R-squared	0.02

4. Information Processing

No of Holdings: Importance of No. of Managers and Fees

	(2)	(3)	(4)	(5)	(6)
Independent Variables:					
No. of Managers		16.184***			
	[4.576]	[4.655]			[4.859]
Manager Tenure		2.964	-1.372	-2.210	1.268
	[2.488]	[2.488]	[2.703]	[2.537]	[2.250]
Fund Age	0.893	0.211	0.372	0.778	0.173
	[0.790]	[0.775]	[0.885]	[0.912]	[0.849]
Fund Expenses					-2.211*
			[0.117]		[1.269]
Fund Size					0.026**
				[0.013]	[0.013]
Year Dummies	No	Yes	No	No	Yes
Fund Type Dummies	No	Yes	No	No	Yes
No. of Observations	6,093	6,093	5,668	5,668	5,662
R-squared	0.03	0.05	0.01		0.07

4. Holdings Distribution

Histogram

Summary Statistics:

Average: 149 Stocks
Median: 95 Stocks
Std. Dev.: 186 Stocks

73% of obs. are below 150 holdings
86% of obs. are below 250 holdings
91% of obs. are below 350 holdings

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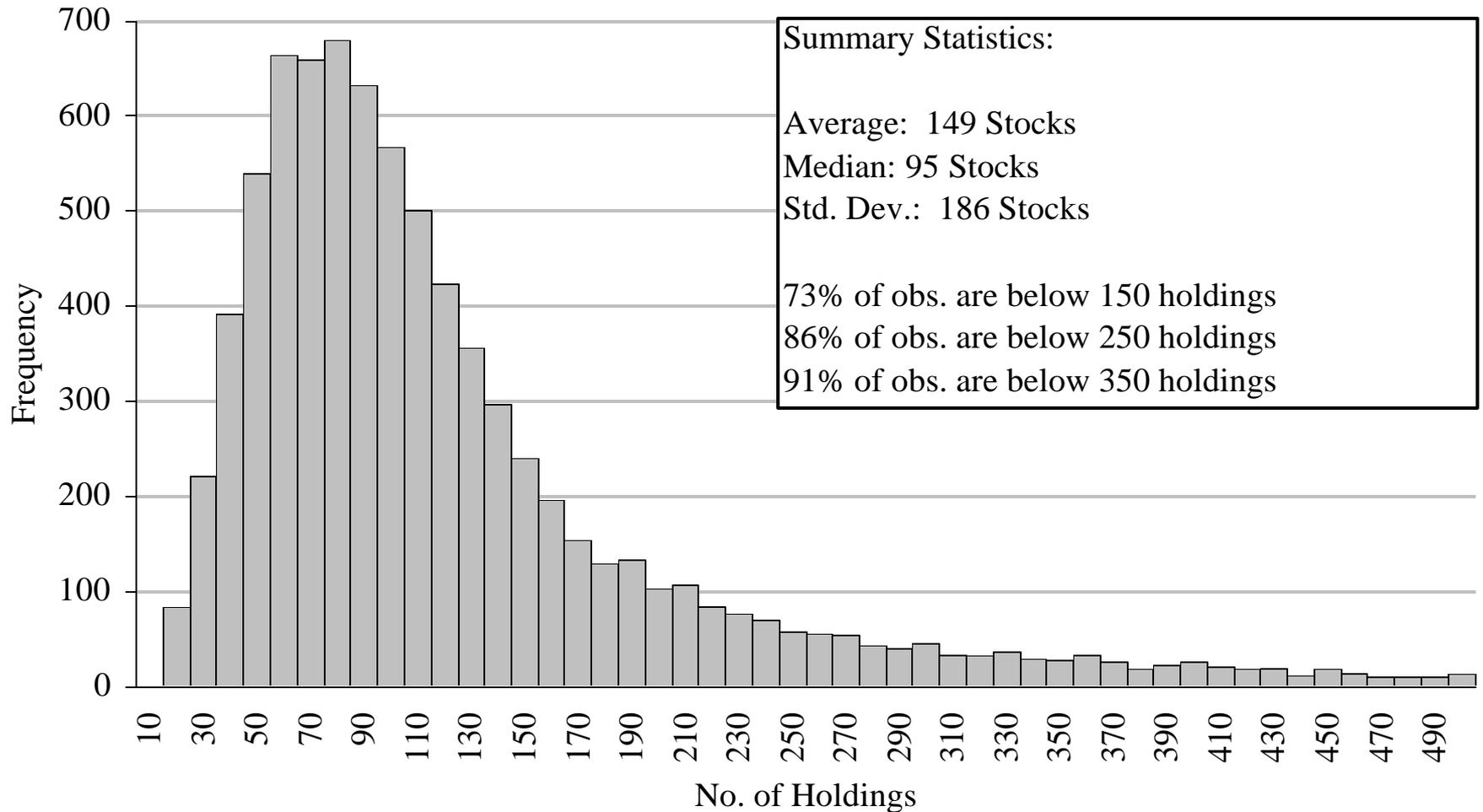
4. Holdings: Family Effects

Averages Across Families

No. of Holdings (y-axis), Families (x-axis)

	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
Average	39	67	89	122	335
Max	56	77	102	153	1,094
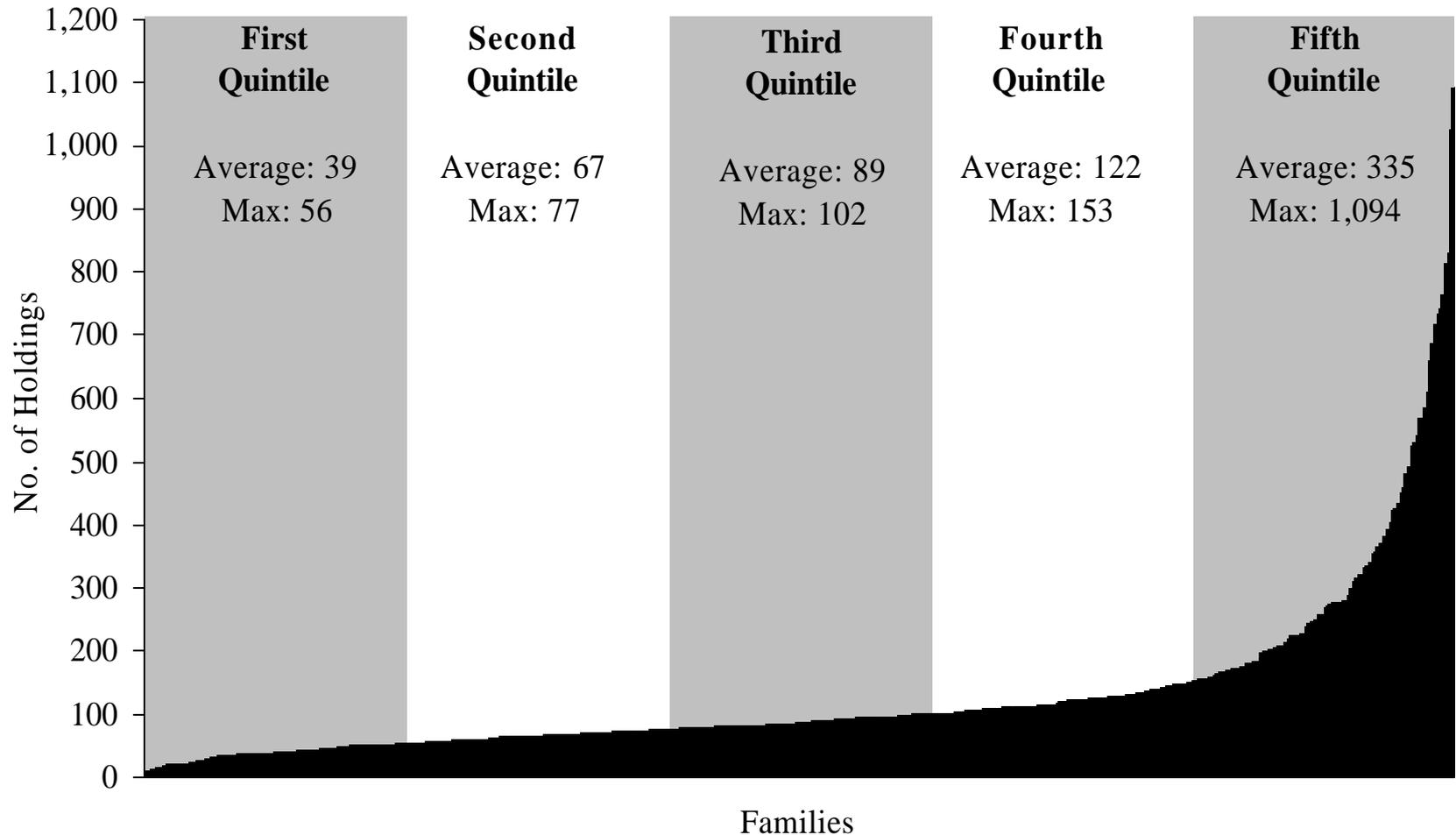
4. Holdings: Family Effects

Regressions: No. of Holdings as Dependent Variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
R-squared	0.00	0.02		0.02			
Independent Variables:							
Year Dummies	Yes	No	No	Yes	Yes	No	Yes
Fund Type Dummies	No	Yes	No	Yes	No	Yes	Yes
Family Dummies	No	No		No			
No. of Observations	8,420	8,420	8,420	8,420	8,420	8,420	8,420
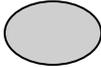
4. Information Processing

Regressions: No. of Holdings as Dependent Variable

	(1)	(2)	(3)	(6)	(7)
Independent Variables:					
No. of Managers			14.762***		
			[4.569]		[3.703]
Manager Tenure	-0.524	-1.654	1.468	1.652	2.243*
	[2.680]	[2.467]	[2.255]	[1.217]	[1.203]
Fund Age	0.739	1.152	0.316	-0.964	-1.013
	[0.884]	[0.925]	[0.845]	[0.870]	[0.863]
Family Expenses	0.094**	-0.747***	-0.650**	-0.017	-0.014
	[0.047]	[0.233]	[0.252]	[0.158]	[0.160]
Family Size		0.009***	0.008***	0.001	0.001
		[0.003]	[0.003]	[0.002]	[0.002]
Year Dummies	No	No	Yes	Yes	Yes
Fund Type Dummies	No	No	Yes	Yes	Yes
Family Dummies	No	No	No	Yes	Yes
No. of Observations	6,100	6,100	6,093	6,100	6,093
R-squared	0.01	0.03	0.07	0.49	

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5. Strategy for Simulations: Min. Variance

- Optimization problem:

$$\underset{x}{Min} \; \mathrm{var}(P) = x'\Sigma x$$

such that :

$$E(P) \geq E(G)$$

$$0 \leq x_i \leq 1$$

$$\sum_i x_i < 1$$

$$P = \left(1 - \sum_i x_i\right) * G + \sum_i x_i * S_i.$$

- Portfolio constructed and evaluated out of sample

5. Strategy for Simulations: Max. Returns

- Optimization problem:

$$\underset{x}{Max}\ \mathrm{E}(P),$$

such that :

$$\mathrm{var}(P) \leq \mathrm{var}(G)$$

$$0 \leq x_i \leq 1$$

$$\sum_i x_i < 1$$

$$P = \left(1 - \sum_i x_i\right) * G + \sum_i x_i * S_i.$$

- Portfolio constructed and evaluated out of sample

5. Alternative Portfolios: Largest No. Funds

Minimizing the Variance

| Type of Global Fund | Average Return (p.y.) | | Differences in Accumulated Daily Returns | Standard Deviation of Daily Returns | | No. of Compar. |
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
Daily Data						
World Funds	6.36%	11.13%				64
Foreign Funds	6.24%	10.12%				76
Pool of World or Foreign Funds	10.53%	15.23%				25
Total	6.93%	11.27%	4.39%	0.91%	0.83%	165
Weekly Data						
World Funds	6.42%	11.51%				64
Foreign Funds	6.24%	9.88%				76
Pool of World or Foreign Funds	10.54%	15.16%				25
Total	6.95%	11.30%	4.37%	2.13%	2.01%	165
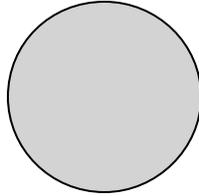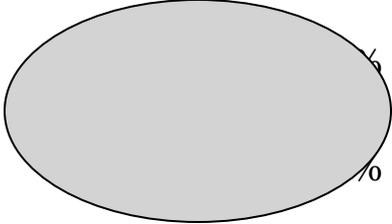
5. Alternative Portfolios: Longest Sample

Minimizing the Variance

Type of Global Fund	Average Return (p.y.)		Differences in Accumulated Daily Returns	Standard Deviation of Daily Returns		No. of Compar.
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
Daily Data						
World Funds	7.90%	10.63%	2.77%	1.14%	1.07%	63
Foreign Funds	5.10%	7.81%	2.82%	0.98%	0.92%	78
Pool of World or Foreign Funds	7.69%	11.91%	4.26%	0.93%	0.86%	24
Total	6.54%	9.47%				165
Weekly Data						
World Funds	8.07%	9.78%	2.44%	2.66%	2.16%	63
Foreign Funds	5.13%	7.35%	2.33%	2.26%	2.16%	78
Pool of World or Foreign Funds	7.94%	12.20%	4.26%	2.20%	2.06%	24
Total	6.65%	8.97%				165
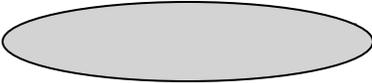
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5. Alternative Portfolios: Largest No. Funds

Maximizing Expected Return

| Type of Global Fund | Average Return (p.y.) | | Differences in Accumulated Daily Returns | Standard Deviation of Daily Returns | | No. of Compar. |
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
Daily Data						
World Funds	6.36%	8.18%	1.84%	0.87%	0.87%	64
Foreign Funds	6.24%	7.15%	0.90%	0.97%	0.97%	76
Pool of World or Foreign Funds	10.53%	14.85%	4.19%	0.86%	0.86%	25
Total	6.93%	8.69%		0.91%	0.91%	165
Weekly Data						
World Funds	6.42%	12.64%	6.09%	2.05%	2.12%	64
Foreign Funds	6.24%	11.29%	4.92%	2.25%	2.30%	76
Pool of World or Foreign Funds	10.54%	16.67%	5.74%	1.99%	2.10%	25
Total	6.95%	12.61%		2.13%	2.20%	165

5. Alternative Portfolios: Longest Sample

Maximizing Expected Return

Type of Global Fund	Average Return (p.y.)		Differences in Accumulated Daily Returns	Standard Deviation of Daily Returns		No. of Compar.
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
Daily Data						
World Funds	7.90%	7.98%	0.07%	1.14%	1.14%	63
Foreign Funds	5.10%	5.44%	0.33%	0.98%	0.98%	78
Pool of World or Foreign Funds	7.69%	12.25%	4.58%	0.93%	0.92%	24
Total	6.54%	7.38%		1.03%	1.03%	165
Weekly Data						
World Funds	8.07%	10.87%	3.20%	2.66%	2.37%	63
Foreign Funds	5.13%	8.34%	3.18%	2.26%	2.27%	78
Pool of World or Foreign Funds	7.94%	13.69%	5.58%	2.20%	2.25%	24
Total	6.65%	10.07%		2.40%	2.31%	165

5. Strategy for Simulations: Min. Variance

- Optimization problem:

$$\underset{x}{Min} \ \text{var}(P - Bench)$$

such that :

$$E(P) \geq E(G)$$

$$0 \leq x_i \leq 1$$

$$\sum_i x_i < 1$$

$$P = \left(1 - \sum_i x_i\right) * G + \sum_i x_i * S_i.$$

- Portfolio constructed and evaluated out of sample

5. Strategy for Simulations: Max. Returns

+ Optimization problem:

$$Max_{x} \ \mathrm{E}(P),$$

such that :

$$\mathrm{var}(P - Bench) \leq \mathrm{var}(G - Bench)$$

$$0 \leq x_i \leq 1$$

$$\sum_i x_i < 1$$

$$P = \left(1 - \sum_i x_i\right) * G + \sum_i x_i * S_i.$$

+ Portfolio constructed and evaluated out of sample

5. Alternative Portfolios: Largest No. Funds

Minimizing the Variance

Type of Global Fund	Average Return (p.y.)		Differences in Accumulated Daily Returns	Standard Deviation of Daily Returns		No. of Compar.
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
World Funds	8.86%	12.25%	3.41%	0.88%	0.81%	57
Foreign Funds	6.20%	9.73%	3.61%	0.96%	0.91%	76
Pool of World or Foreign Funds	10.60%	14.88%	4.20%	0.86%	0.85%	24
Total	7.82%	11.41%				157

5. Alternative Portfolios: Longest Sample

Minimizing the Variance

Type of Global Fund	Average Return (p.y.)		Differences in Accumulated Daily Returns	Standard Deviation of Daily Returns		No. of Compar.
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
World Funds	8.94%	10.28%	2.29%	1.14%	0.85%	63
Foreign Funds	5.07%	7.70%	2.70%	0.97%	0.94%	78
Pool of World or Foreign Funds	7.50%	11.71%	4.29%	0.94%	0.90%	23
Total	6.88%	9.24%				164

5. Alternative Portfolios: Largest No. Funds

	Maximizing Expected Return					
	Average Return (p.y.)		Differences in	Standard Deviation of Daily Returns		
Type of Global Fund	Global Fund	Port. Spec. Funds	Accumulated Daily Returns	Global Fund	Port. Spec. Funds	No. of Compar.
World Funds	8.86%	12.13%	3.37%	0.88%	0.78%	57
Foreign Funds	6.20%	10.50%	4.36%	0.96%	0.90%	76
Pool of World or Foreign Funds	10.60%	14.69%	4.00%	0.86%	0.83%	24
Total	7.82%	11.72%		%		157

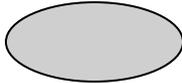# 5. Alternative Portfolios: Longest Sample

Maximizing Expected Return

| Type of Global Fund | Average Return (p.y.) | | Differences in Accumulated Daily Returns | Standard Deviation of Daily Returns | | No. of Compar. |
	Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
World Funds	8.94%	10.13%	2.22%	1.14%	0.82%	63
Foreign Funds	5.07%	8.34%	3.37%	0.97%	0.92%	78
Pool of World or Foreign Funds	7.50%	12.52%	5.03%	0.94%	0.88%	23
Total	6.88%	9.61%		%		164

5. Skewness, Kurtosis: Largest No. Funds

Minimizing the Variance

| Type of Global Fund | Returns on Global Funds | | Returns on Port. Spec. Funds | | No. of Compar. |
	Skewness	Kurtosis	Skewness	Kurtosis	
World Stock	-0.63	10.10	-0.70	8.81	64
	[0.99]	[14.45]	[0.92]	[16.08]	
Foreign Stock	-0.76	11.11	-0.93	10.45	76
	[1.06]	[15.60]	[0.81]	[9.48]	
Pool of World or Foreign Funds	-0.42	6.57	-0.79	9.85	25
	[0.49]	[5.64]	[0.90]	[11.91]	
Total					165
	[0.97]	[14.09]	[0.87]	[12.72]	

5. Skewness, Kurtosis: Longest Sample

	Minimizing the Variance				
	Returns on Global Funds		Returns on Port. Spec. Funds		No. of
	Skewness	Kurtosis	Skewness	Kurtosis	Compar.
Type of Global Fund					
World Stock	0.17	69.50	0.16	66.99	63
	[7.67]	[447.15]	[7.64]	[447.34]	
Foreign Stock	-0.92	14.07	-0.51	41.39	78
	[1.22]	[20.22]	[4.83]	[251.41]	
Pool of World	-0.44	6.68	-0.84	10.26	24
or Foreign Funds	[0.44]	[4.56]	[0.90]	[12.08]	
Total					165
	[4.82]	[276.70]	[5.77]	[325.16]	

5. Skewness, Kurtosis: Largest No. Funds

Maximizing Expected Return

	Returns on Global Funds		Returns on Port. Spec. Funds		No. of
	Skewness	Kurtosis	Skewness	Kurtosis	Compar.
Type of Global Fund					
World Stock	-0.63	10.10	-0.63	9.91	64
	[0.99]	[14.45]	[0.96]	[14.085]	
Foreign Stock	-0.76	11.11	-0.76	10.86	76
	[1.06]	[15.60]	[1.05]	[15.00]	
Pool of World	-0.42	6.57	-0.72	10.30	25
or Foreign Funds	[0.49]	[5.64]	[1.01]	[13.12]	
Total					165
	[0.97]	[14.09]	[1.00]	[14.30]	

5. Skewness, Kurtosis: Longest Sample

Maximizing Expected Return

Type of Global Fund	Returns on Global Funds		Returns on Port. Spec. Funds		No. of Compar.
	Skewness	Kurtosis	Skewness	Kurtosis	
World Stock	0.17	69.50	0.17	69.47	63
	[7.67]	[447.15]	[7.67]	[447.16]	
Foreign Stock	-0.92	14.07	-0.85	12.61	78
	[1.22]	[20.22]	[1.06]	[16.13]	
Pool of World or Foreign Funds	-0.44	6.68	-0.73	10.95	24
	[0.44]	[4.56]	[1.05]	[13.40]	
Total					165
	[4.82]	[276.70]	[4.81]	[276.62]	

5. Minimizing Risk: Largest No. Funds

Weekly Data
Minimization of Variance

	Average Return (per week)		ttest:	No. of
	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.36%	-0.26%	3.29	4,865
Between -1% and -5%	-1.53%	-1.49%	1.68	10,140
Between -5% and -10%	-3.98%	-4.34%	-2.26	945
Smaller than -10%			-0.12	190

Maximization of Return

Return on MSCI Emerging	Average Return (per week)		ttest:	No. of
Market Index	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.36%	-0.35%	0.59	4,865
Between -1% and -5%	-1.53%	-1.53%	-0.23	10,140
Between -5% and -10%	-3.98%	-4.10%	-0.69	945
Smaller than -10%			-0.65	190

5. Minimizing Risk: Longest Sample

Weekly Data
Minimization of Variance

Return on MSCI Emerging	Average Return (per week)		ttest:	No. of
Market Index	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.30%	-0.23%	2.47	7,334
Between -1% and -5%	-1.50%	-1.48%	0.92	14,437
Between -5% and -10%	-4.07%	-4.35%	-2.04	1,309
Smaller than -10%	-3.66%	-3.73%	-0.35	290

Maximization of Return

Return on MSCI Emerging	Average Return (per week)		ttest:	No. of
Market Index	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.30%	-0.30%	0.22	7,334
Between -1% and -5%	-1.50%	-1.51%	-0.21	14,437
Between -5% and -10%	-4.07%	-4.12%	-0.40	1,309
Smaller than -10%	-3.66%	-3.71%	-0.23	290

5. Minimizing Risk: Largest No. Funds

Weekly Data

Minimization of Variance

	Average Return (per week)		ttest:	No. of
	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%			4.08	6,357
Between -1% and -5%	-2.21%	-2.17%	1.96	8,898
Between -5% and -10%	-6.05%	-6.36%	-2.74	580
Smaller than -10%			-1.77	97

Maximization of Return

Return on Portfolios	Average Return (per week)		ttest:	No. of
of Specialized Funds:	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.47%	-0.42	6,247
Between -1% and -5%	-2.20%	-2.23%	-2.32	9,233
Between -5% and -10%	-6.27%	-6.33%	-0.98	748
Smaller than -10%	-12.28%	-13.00%	-1.69	117

5. Minimizing Risk: Longest Sample

Weekly Data
Minimization of Variance

Return on Portfolios	Average Return (per week)		ttest:	No. of
of Specialized Funds:	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.50%	-0.47%	3.21	9,386
Between -1% and -5%	-2.22%	-2.19%	2.05	12,618
Between -5% and -10%	-6.23%	-6.37%	-1.77	914
Smaller than -10%	-11.85%	-12.72%	-2.14	158

Maximization of Return

Return on Portfolios	Average Return (per week)		ttest:	No. of
of Specialized Funds:	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.47%	-0.79	9,288
Between -1% and -5%	-2.21%	-2.23%	-1.70	12,944
Between -5% and -10%	-6.42%	-6.45%	-0.72	1,133
Smaller than -10%	-12.92%	-13.18%	-0.74	165

5. Minimizing Risk: Largest No. Funds

Weekly Data

Minimization of Variance

	Average Return (per week)		ttest:	No. of
	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.34%	11.73	6,355
Between -1% and -5%	-2.23%	-1.91%	19.76	9,222
Between -5% and -10%	-6.36%	-5.25%	13.66	776
Smaller than -10%				111

Maximization of Return

	Average Return (per week)		ttest:	No. of
Return on Global Funds	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.45%	2.45	6,355
Between -1% and -5%	-2.23%	-2.19%	2.83	9,222
Between -5% and -10%	-6.36%	-6.17%	2.85	776
Smaller than -10%	-12.89%	-12.76%	0.32	111

5. Minimizing Risk: Longest Sample

Weekly Data

Minimization of Variance

	Average Return (per week)		ttest:	No. of
	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.37%		9,334
Between -1% and -5%	-2.23%	-1.98%		12,939
Between -5% and -10%	-6.46%	-5.55%		1,153
Smaller than -10%	-13.22%	-11.31%		165

Maximization of Return

	Average Return (per week)		ttest:	No. of
Return on Global Funds	Global Fund	Port. Spec. Funds	Diff > 0	Obs.
Between 0% and -1%	-0.47%	-0.46%	1.60	9,334
Between -1% and -5%	-2.23%	-2.20%	2.53	12,939
Between -5% and -10%	-6.46%	-6.32%	2.40	1,153
Smaller than -10%	-13.22%	-12.98%	0.69	165

5. Transaction Costs: ETFs

Minimizing the Variance

| Family | Type of Sim. | Average Return (p.y.) | | Differences in Accumulated Daily Returns | Standard Deviation of Daily Returns | | No. of Compar. |
		Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
iShares							
Without Country Funds	Foreign	9.41%	12.15%	2.56%	1.06%	1.05%	2
With Country Funds	Foreign	9.41%	11.88%	2.36%	1.06%	1.03%	2
Without Country Funds	World	4.12%	10.52%	6.26%	1.00%	0.97%	2
With Country Funds	World	4.12%	10.78%	6.54%	1.00%	0.95%	2
Total		6.76%	11.33%		1.03%	1.00%	8

5. Transaction Costs: ETFs

Maximizing Expected Return

Family	Type of Sim.	Average Return (p.y.)		Differences in Accumulated Daily Returns	Standard Deviation of Daily Returns		No. of Compar.
		Global Fund	Port. Spec. Funds		Global Fund	Port. Spec. Funds	
iShares							
Without Country Funds	Foreign	9.41%	13.13%	3.26%	1.06%	1.11%	2
With Country Funds	Foreign	9.41%	12.96%	2.96%	1.06%	1.16%	2
Without Country Funds	World	4.12%	11.71%	7.17%	1.00%	1.05%	2
With Country Funds	World	4.12%	11.77%	6.95%	1.00%	1.13%	2
Total		6.76%	12.39%		1.03%	1.11%	8

Presentation

1. Motivation

2. Data

3. How Do MFs Allocate Their Portfolios Globally?

4. What Factors Might Explain Global Portfolios?

5. Do Returns and Investment Strategies Matter?

6. Conclusions

6. Conclusions: Summary of Main Results

i. Lack of diversification

- MFs, especially global funds, increased substantially

- MFs hold a small number of assets in their portfolios

  - For particular funds, holdings even smaller

- Number of holdings independent of investment scope

  - Similar for U.S. funds

- Number of holdings does not increase for global funds

  - Compared to specialized funds within family

- No. of stocks and countries <u>decrease</u> for global funds, within regions

  - As going global, stocks and countries drop from portfolios

6. Conclusions: Summary of Main Results

ii. Patterns not easily explained by obvious factors

- Not lack of available of instruments

  - As a whole, MFs hold 22% of available stocks

  - Fraction decreases over time

  - Robust across fund types

  - Each fund holds about 0.12% of mkt. cap.

- Not information asymmetry or transaction costs

  - Within family comparisons

  - Within families, funds share few stocks (low commonality)

  - No. of stocks not explained by information processing capacity

- Strong family effects

6. Conclusions: Summary of Main Results

iii. Potential diversification gains

- Portfolio of funds yield better returns given variance

- Portfolio of funds yield lower variance given returns

- Robust to series of tests

- Robust to including benchmarks (tracking-error model)

- Global funds not better at minimizing risk

  - Similar skewness and kurtosis

  - Similar returns (or even better ones) when things sour

- Not acounted by different trading strategies

- Not accounted by high trading costs (costly arbitrage)

6. Conclusions: Future research

- New set of stylized facts

- Able to reject potential explanations

- Still need to understand what drives results

- What is behind family effects?

Thank you!