

# **EXCHANGE TRADED FUNDS**

**Fall 2002**

## **Characteristics:**

- (1) Ownership share of a mutual fund**
- (2) Trades like a stock**
- (3) Redemption in kind**

## **Example: Spider**

- (1) One share 1/10 of price of S&P**
- (2) Can create or delete by exchanging shares plus cash at the end of the day in units of 50,000 shares and cost of \$3000. (Fixed not effected by size)**

Table 1: Assets in Equity Mutual Funds and Exchange Traded Funds, 1994-2001

Year	Equity Mutual Funds	Domestic Equity Index Funds	Exchange Traded Funds
1993	740.7	22.6	0.46
1994	852.8	26.0	0.42
1995	1249.1	47.0	1.05
1996	1726.1	83.5	2.40
1997	2368.0	147.9	6.70
1998	2978.2	233.1	15.56
1999	4041.9	344.0	33.86
2000	3962.3	339.3	65.59
2001	3348.7	n.a.	78.85

Source: Authors' tabulations based on data from the Investment Company Institute (2001a, b). All entries except 2001 correspond to December of the indicated calendar year; 2001 data are for November.

Table 2: Exchange Traded Funds with More than \$1.5 Billion in Assets, December 31, 2001

Fund Name	Assets (\$ Billion)	Launch Date	Expense Ratio
SPDR Trust (SPY)	\$30.4	1/29/93	0.12%
NASDAQ-100 Trust (QQQ)	21.8	3/09/99	0.18
S&P Midcap 400 Trust (MDY)	4.8	5/4/95	0.25
iShares S&P 500 Index Fund (IVV)	3.6	5/15/00	0.09
DOW Diamond Series Trust I (DIA)	3.0	1/27/98	0.12
iShares Russell 2000 Index Fund	2.1	5/22/00	0.20
HOLDRS Biotech (BHH)	1.6	11/22/99	*
iShares Russell 3000 Index Fund	1.5	5/22/00	0.20

Source: Wall Street Journal January 7, 2002, page R17. \* denotes a minimum expense ratio of eight cents per share.

## **Types of ETF:**

**(1) Trusts**

**Spy**

**(2) Managed funds**

**i shares**

**(3) Grantor trusts**

**Hold R S**

## **Trusts:**

- (1) Must replicate**
- (2) No lending**
- (3) Dividends held in cash**

## **Managed funds:**

- (1) Can sample**
- (2) Hold futures or cash**
- (3) Reinvest immediately**

## **Granter trust:**

- (1) Hold shares directly**
- (2) No extra management fee**
- (3) Can unbundled**
- (4) Retain voting rights**
- (5) Get dividend directly**

## Important Characteristics

### **Advantages:**

- (1) Ability to trade intra-day**
- (2) Can short sell usually on downtick**
- (3) Generally tax efficient**
- (4) Can lend**

### **Considerations:**

- (1) Trading costs**
- (2) Tracking error**
- (3) Dividend earnings loss**
- (4) Deviations of price from NAV**

**SPIDERS**



(1)	Standard Index				Shortfall in Performance		
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	With Dividends	Without Dividends	NAV	S&P	Total Tracking <sup>1</sup>	Expenses and	Dividends
	NAV	S&P	NAV	S&P	(2)-(3)	(4)-(5)	(6)-(7)
1993*	8.92	9.19	6.25	6.30	-0.27	-0.06	-0.21
1994	1.15	1.32	-1.46	-1.53	-0.17	0.08	-0.25
1995	37.20	37.56	34.12	34.11	-0.36	0.01	-0.37
1996	22.72	22.97	20.26	20.26	-0.25	0.00	-0.25
1997	33.06	33.4	31.03	31.01	-0.34	0.03	-0.37
1998	28.28	28.57	26.64	26.67	-0.29	-0.03	-0.26
Average	21.89	22.17	19.47	19.47	-0.28	0.00	-0.28

**Dividend loss:**

**(1) Frequency quarterly payment**

- a. If paid evenly 1 ½ months**
- b. Delay one month**
- c. Therefore, 2 ½ months delay**

**(2) Average S&P return 22.2**

$$2.2 \times \frac{1.5}{12} \times 22.2 = 10.2$$

**Excess Return on Spider over S&P as a Function of Reinvestment Return on Dividend**  
 The table below presents the difference between the Spider return and the return on the S&P index for six groups formed by ranking the 24 quarterly S&P returns from lowest to highest.

Group	Spider Returns minus S&P index return (Quarterly Reinvestment in %)
<b>Lowest</b>	0.020
2	-0.011
3	-0.028
4	-0.041
5	-0.062
<b>Highest</b>	-0.109

**Cause of shortfall:**

**(1) Dividends      10.2 bp**

**(2) Expenses      18 bp**

**28.2 bp**

## **Deviations of price from NAV:**

- (1) Limited by creation and deletion**
- (2) Overstates due to 15 minute differential**

**Frequency Distribution of Spider Net Asset Value Versus Price**

NAV - Spider Price				$\frac{\text{NAV} - \text{Spider Price}}{\text{NAV}}$			
Difference in Dollars	Frequency	Percentage	Difference in Percentage	Frequency	Percentage		
-2.05 to -1.05	1	.001	-2.05 to -1.05	0	0		
-1.05 to -0.55	1	.001	-1.05 to -0.55	3	.002		
-0.55 to -0.45	4	.003	-0.55 to -0.45	6	.004		
-0.45 to -0.35	8	.005	-0.45 to -0.35	12	.008		
-0.35 to -0.25	23	.015	-0.35 to -0.25	47	.031		
-0.25 to -0.15	73	.049	-0.25 to -0.15	151	.101		
-0.15 to -0.05	255	.170	-0.15 to -0.05	260	.174		
0.05 to 0.05	676	.452	-0.05 to 0.05	439	.293		
0.05 to 0.15	304	.203	0.05 to 0.15	312	.208		
0.15 to 0.25	79	.053	0.15 to 0.25	154	.103		
0.25 to 0.35	33	.022	0.25 to 0.35	56	.037		
0.35 to 0.45	19	.013	0.35 to 0.45	25	.017		
0.45 to 0.55	11	.007	0.45 to 0.55	15	.010		
0.55 to 1.05	10	.007	0.55 to 1.05	17	.011		
		Average = .014			Average = .018%		

**Persistence:**

$$(\text{price-NAV})_{t+1} = -1.34 + .0620 (\text{price - NAV})$$

$$R^2 = .004$$

## **Indexing Vehicles:**

- (1) Spiders**
- (2) Index funds**
- (3) Futures**



## **Factors that Effect Performance of Index Funds:**

- (1) Cost of trading**
- (2) Adjustment to capital changes**
  - a. Tender offers**
  - b. Index changes**
  - c. Inflows/outflows**
- (3) Security lending**
- (4) Treatment of dividends**
- (5) Management fees**

<u>Fund Name</u>	<u>Annualized 3-yr Return - S&amp;P500</u>	<u>Expense Ratio</u>
ARK Equity Index Instl	0.16	0.25
GE Instl S&P 500 Index Inv	0.13	0.15
Vanguard Instl Idx InstPl	0.11	0.03
California Invmtf S&P 500 Idx	0.09	0.20
Vanguard Instl Index	0.08	0.06
Vanguard 500 Index	-0.03	0.18
Prudential Stock Index I	-0.06	0.30
ARK Equity Index A	-0.07	0.50
Forum Equity Index	-0.11	0.25
Eclipse Indexed Equity	-0.12	0.30
Schwab S&P 500 Sel	-0.15	0.20
Transamerica Prem Index Inv	-0.16	0.25
Prudential Stock Index Z	-0.17	0.40
Fidelity Spartan 500 Idx	-0.18	0.19
Wells Fargo Index I	-0.18	0.25
DFA U.S. Large Company	-0.19	0.15
Fidelity Spartan U.S. Eq Idx	-0.19	0.17
Northern Instl Equity Idx A	-0.20	0.21
Evergreen Equity Index Instl	-0.22	0.30
Schwab S&P 500 e.Sh	-0.24	0.29
USAA S&P 500 Index	-0.24	0.18
Dreyfus Basic S&P 500 Stock	-0.25	0.20
SEI Indox S&P 500 Index E	-0.26	0.40
Galaxy II Large Co Index Ret	-0.27	0.47
Nations Large Cap Idx Prim A	-0.28	0.35
T. Rowe Price Equity Idx 500	-0.28	0.35
Schwab S&P 500 Inv	-0.30	0.36
Barclays Gbl Inv S&P 500 St	-0.31	0.20
One Group Equity Index I	-0.31	0.35
Fifth Third Eq Idx Instl	-0.33	0.40
Eclipse Indexed Equity Svc	-0.36	0.55
Merrill Lynch S&P 500 Idx A	-0.38	0.38
Munder Index 500 Y	-0.39	0.36
Harris Ins Index Instl	-0.41	0.45
Nationwide S&P 500 Idx Loc	-0.42	0.35

<u>Fund Name</u>	<u>Annualized 3-yr Return - S&amp;P500</u>	<u>Expense Ratio</u>
Wachovia Equity Index Y	-0.44	0.41
Brinson S&P 500 Index Y	-0.45	0.35
Evergreen Equity Index InsSv	-0.47	0.55
Northern Instl Equity Idx C	-0.47	0.45
Federated Max-Cap Index Inst	-0.48	0.34
Scudder S&P 500 Index S	-0.49	0.40
Morgan Stanley S&P 500 Idx D	-0.50	0.50
Northern Stock Index	-0.50	0.55
Strong Index 500	-0.50	0.45
Munder Index 500 A	-0.55	0.51
Nations Large Cap Idx Inv A	-0.55	0.35
Dreyfus S&P 500 Index	-0.56	0.50
One Group Equity Index A	-0.56	0.60
Orchard S&P 500 Index	-0.56	0.60
Fifth Third Eq Idx Inv A	-0.58	0.65
Mason Street Index 500 Stk A	-0.58	0.85
Nationwide S&P 500 Idx InSvc	-0.60	0.48
Munder Index 500 K	-0.64	0.61
Merrill Lynch S&P 500 Idx D	-0.65	0.63
First Amer Equity Index A	-0.66	0.60
Harris Ins Index N	-0.66	0.70
Wells Fargo Equity Index A	-0.66	0.71
Brinson S&P 500 Index A	-0.67	0.60
Wachovia Equity Index A	-0.70	0.66
Victory Stock Index A	-0.73	0.59
Morgan Stanley S&P 500 Idx A	-0.74	0.69
Federated Max-Cap Index InSv	-0.78	0.64
Nationwide S&P 500 Idx Svc	-0.78	0.63
MainStay Equity Index A	-0.88	0.92
Munder Index 500 B	-0.88	0.86
Mason Street Index 500 Stk B	-1.10	1.50
One Group Equity Index C	-1.27	1.35
One Group Equity Index B	-1.29	1.35
Brinson S&P 500 Index C	-1.38	1.35
Wells Fargo Equity Index B	-1.39	1.48
First Amer Equity Index B	-1.41	1.35

<u>Fund Name</u>	<u>Annualized 3-yr Return - S&amp;P500</u>	<u>Expense Ratio</u>
Morgan Stanley S&P 500 Idx B	-1.50	1.50
Morgan Stanley S&P 500 Idx C	-1.50	1.50
ProFunds Bull Inv	-3.56	1.54
ProFunds Bull Svc	-4.45	2.38

**1994 – 1998 Vanguard underperformed S&P by 10 basis points and beat Spiders by 18 bp.**

## **Futures:**

- (1) Assume perfect forecasting**
- (2) Could be higher if used higher yield short term instruments**

## **Futures:**

**(1) Index fund ← Equivalent → Futures  
T-Bills**

**(2) Issue does future sell for arbitrage value**

$$F_{\text{fair value}} =$$

$$\begin{array}{rcccl} \text{current} & & \text{present} & & \text{present} \\ \text{index} & & \text{value} & & \text{value} \\ \text{value} & - & \text{dividends} & - & \text{exercise} \\ & & & & \text{price} \end{array}$$

**(3) Net slightly positive return + 3 bp**

**Futures and cash outperformed S&P by 2.7 bp.**



**SPIDERS & FUTURES  
MOVE TOGETHER**

## Spiders & Futures Prices

$$[\Delta \text{ Spider - accumulations}] = .01 + .99[\Delta \text{ future fair value}]$$

$$R^2 = .98$$

## **Tax Effects:**

### **(1) Embedded appreciation**

- a. Age**
- b. Exchanges in kind**

### **(2) Capital changes**

- a. Index changes**
- b. Merger**
- c. Liquidity**

**September 30, 2000**

**SPDR:**

<b>Assets</b>	<b>24.29 billion</b>
<b>Capital loss carry forwards</b>	<b>.52 billion</b>
<b>Unrealized capital loss</b>	<b>1.06 billion</b>

## **CREATION DELETION**

**The Creation and Deletion of Spider Units**

<b>Creations and Deletions (in thousands)</b>	<b>Frequency</b>	<b>Percentage Occurrence</b>
-4500 or larger deletion	4	0.27
-4499 to -3000	7	0.47
-2999 to -2000	18	1.20
-1999 to -1500	8	0.53
-1499 to -1000	12	0.80
-999 to -500	13	0.87
-499 to -50	5	0.33
0	1271*	85.96
50 to 499	11	0.73
500 to 999	65	4.34
1000 to 1499	27	1.80
1500 to 1999	18	1.20
2000 to 2999	25	1.67
3000 to 3999	3	0.20
4000 to 4999	6	0.40
5000 or more	3	0.20

Net Average Deletion = -1836.119

Net Average Creation = 1395.43

\* Creations and deletions can not occur in the range -49.9 to -49.9.

# VOLUME

**Daily Volume As Percentage of Outstanding Shares**

<b>Year</b>	<b>Average Volume</b>
1993	4.53%
1994	3.90%
1995	2.67%
1996	4.49%
1997	8.53%
1998	10.65%



### Explanations of Daily Spider Volume

	Intercept	SP500 high - SP500 low SP500 close	absolute value of (SPDR price - SPDR max) SPDR price at time t-1	R <sup>2</sup>
Coefficient	-0.016	3.228	2.376	0.52
Standard Deviation	0.001	0.085	0.506	
t-statistic	-14.152	37.790	4.693	

**Regression of Relative Volume of Spider against Market Volatility**

Year	Intercept		$\frac{SP500_{high} - SP500_{low}}{SP500_{close}}$		$R^2$
	Coef.	T Value	Coef.	T Value	
1993	0.00746	0.99	-0.34	-2.74	0.03
1994	0.00478	4.59	0.13	1.15	0.00
1995	0.00467	8.95	-0.03	-0.43	0.00
1996	0.00846	8.74	0.34	3.98	0.06
1997	0.01699	5.74	1.62	8.83	0.23
1998	0.0416	14.49	1.25	8.06	0.20

**OTHER EXCHANGE  
TRADED FUNDS**

**Exhibit 14: Structure of ETFs and basket shares**

Product Examples	Unit Investment Trust SPY, MDY, QQQ	Managed Investment Company Sector SPDRs, iShares, WEBS	Grantor Trust HOLDRS
Registered Investment Company	Yes	Yes	No
Attempts Index Replication	Yes	Yes	No
Allowed to Use Derivatives	No	Yes	No
Fund Allowed to Land Holdings	No	Yes	No
Investor Allowed to Lehd Product	Yes	Yes	No**
Position Limits for Mutual Funds	12(d)(1); Limits**	12(d)(1) Limits**	Yes None
Tax Treatment	Trust distributes dividends and capital gains; enjoys redemption-in-kind advantage***	Fund distributes dividends and capital gains; enjoys redemption-in-kind advantage***	Same as owning underlying stocks
Allowed to Trade Intraday	Yes	Yes	Yes
Allowed to Sell Short on Downtick****	Yes	Yes	Yes
Voting Rights for Underlying	Held by trustee	Held by fund	Passed to investor
Creation/Redemption	Yes; Large-Sized Lots (e.g., 50,000 Shares) Trust cannot reinvest dividends; must hold all underlying securities in index	Yes; Large-Sized Lots (e.g., 50,000 Shares)	Yes; 100-Share Lots
Other Differences		Fund can hold sample of underlying securities in index	Can only execute in 100 share lots

\* The unit investment trust structure does not allow use of derivatives, but the SPY, MDY, and QQQ UITs were not set up to allow their use.  
 \*\* The grantor trust structure does not provide lending held securities, but the trust's products were not structured to do so.  
 \*\*\* Section 220(3) of the Investment Company Act of 1940 provides that "no registered investment company may... acquire more than 1% of the outstanding stock of another investment company... (B) also, the securities of any single investment company with an aggregate value in excess of 5% of its total assets... (C) acquire... Such redemptions are tax exempt to redeeming shareholder but not to an investment company or shareholder at large. For mutual funds, redemption requires delivery of cash, and therefore liquidation of portfolio, which may have adverse tax consequences.  
 \*\*\*\* Exemptions to the Short Sale Rule (Rule 10b-1) under the Securities Exchange Act of 1934 are established by the exchange listing the ETF via a "No action" letter from the Securities Exchange Commission. The Commission determines whether to grant such an exemption on a case-by-case basis. At present, all ETFs have been granted "No action" relief.

**EXHIBIT 1**  
Ten Most Actively Traded ETFs

Name	Ticker	Price	NAV	YTD Return	Volume
Nasdaq 100	QQQ	\$15.86	\$15.64	-2.75%	59,211,700
SPDR 500	SPY	\$123.28	\$123.80	-7.12%	9,731,000
SPDR Microcap 400	MIDV	\$15.02	\$15.09	0.35%	1,586,400
Diamonds	DIA	\$116.25	\$116.35	-0.56%	1,571,400
SPDR Financial	XLF	\$28.45	\$28.55	-3.22%	786,400
Shares MSCI Japan	EWJ	\$10.54	\$10.25	-7.99%	641,500
Shares Russell 2000	RWV	\$101.25	\$101.75	-5.72%	652,300
Shares S&P500	IVV	\$125.25	\$123.76	-7.10%	554,500
SPDR Technology	XLK	\$28.25	\$27.96	-10.79%	401,000
Shares MSCI LK	EWU	\$15.79	\$15.67	-13.85%	388,500

As of June 30, 2007. Prices truncated by average daily volume over the period 10/04-5/07.

**EXHIBIT 2**  
Ten Best-Performing ETFs

Name	Ticker	Price	NAV	YTD Return
Shares MSCI Mexico (Euro)	EWX	\$16.73	\$16.60	23.15%
Shares MSCI South Korea	EWY	\$14.23	\$14.13	17.55%
Shares Russell 2000 Value	RWN	\$128.75	\$128.84	11.45%
Shares S&P MidCap 400/Barr Value	IJS	\$94.66	\$85.03	10.77%
Shares S&P SmallCap 600/Barr Value	IJS	\$60.60	\$60.48	9.25%
Shares Dow Jones US Consumer Cyclical	LYC	\$83.51	\$82.57	9.11%
Shares Dow Jones US Real Estate	IYR	\$128.75	\$128.84	8.10%
StreetTracks US Small Cap Value	DSV	\$29.64	\$29.53	8.09%
SPDR Consumer Services	XLV	\$27.57	\$27.53	7.26%
SPDR Cyclical Transportation	XLY	\$91.75	\$91.20	6.82%

As of June 30, 2007.

**EXHIBIT 3**  
Ten Worst-Performing ETFs

Name	Ticker	Price	NAV	YTD Return
Shares Dow Jones US Internet	IYV	\$19.40	\$19.38	-37.24%
StreetTracks Morgan Stanley Internet	NIJ	\$19.25	\$19.04	-35.52%
Shares MSCI Sweden	EWSD	\$13.65	\$13.67	-25.18%
FORTUNE 500	TEF	\$40.80	\$40.62	-21.59%
NASDAQ 100	QQQ	\$45.85	\$45.69	-21.76%
Shares MSCI Switzerland	EWL	\$13.40	\$13.45	-20.81%
Shares MSCI Switzerland	EWL	\$17.98	\$17.98	-20.44%
Shares MSCI Italy	EWI	\$5.42	\$5.41	-19.57%
Shares MSCI Singapore	EWQ	\$20.00	\$20.09	-19.19%
Shares MSCI France	EWU	\$15.50	\$15.17	-17.97%

## APPENDIX B

List of ETFs

### EXHIBIT B-1

U.S. Broad Exchange-Traded Funds as of July 2001

Symbol	Fund Name	Underlying Index	Exchange	Fee (%)	Structure	Manager
DIA	DIAMONDS Trust Series 1 (DIA)	DOV	Amex	0.18	ETF	SSgA
EU9	EUROLINE 500 Index Fund	EU9	Amex	0.20	Mutual Fund	SSgA
FEF	EUROLINE 50 Index Fund	FEF	Amex	0.20	Mutual Fund	SSgA
IWF	iShares Russell 1000 Growth Index Fund	NDI	Amex	0.20	Mutual Fund	BGI
IWD	iShares Russell 1000 Index Fund	NDJ	Amex	0.15	Mutual Fund	BGI
IWD	iShares Russell 1000 Value Index Fund	NJC	Amex	0.20	Mutual Fund	BGI
IWO	iShares Russell 2000 Growth Index Fund	NLO	Amex	0.25	Mutual Fund	BGI
IWM	iShares Russell 2000 Index Fund	NJM	Amex	0.20	Mutual Fund	BGI
IWN	iShares Russell 2000 Value Index Fund	NAJ	Amex	0.25	Mutual Fund	BGI
IWL	iShares Russell 3000 Growth Index Fund	NDC	Amex	0.25	Mutual Fund	BGI
IWV	iShares Russell 3000 Index Fund	NMV	Amex	0.20	Mutual Fund	BGI
IWV	iShares Russell 3000 Value Index Fund	MNV	Amex	0.25	Mutual Fund	BGI
IWP	iShares Russell Midcap Growth Index Fund	NFW	Amex	0.25	Mutual Fund	BGI
IWR	iShares Russell Midcap Index Fund	NLZ	Amex	0.20	Mutual Fund	BGI
IWS	iShares Russell Midcap Value Index Fund	NLV	Amex	0.25	Mutual Fund	BGI
ODE	iShares S&P 100 Index Fund	ODE	CBCE	0.20	Mutual Fund	BGI
IVV	iShares S&P 500 Index Fund	MSV	Amex	0.07	Mutual Fund	BGI
IWV	iShares S&P 500/BARRA Growth Index Fund	NCO	Amex	0.18	Mutual Fund	BGI
IWR	iShares S&P 500/BARRA Value Index Fund	NME	Amex	0.18	Mutual Fund	BGI
IJH	iShares S&P MidCap 400 Index Fund	NLI	Amex	0.20	Mutual Fund	BGI
IJK	iShares S&P MidCap 400 Growth Index Fund	NNK	Amex	0.25	Mutual Fund	BGI
IJ	iShares S&P MidCap 400 Value Index Fund	NJF	Amex	0.25	Mutual Fund	BGI
IJK	iShares S&P SmallCap 600 Index Fund	NIR	Amex	0.20	Mutual Fund	BGI
IJT	iShares S&P SmallCap 600 Growth Index Fund	NIT	Amex	0.25	Mutual Fund	BGI
IJS	iShares S&P SmallCap 600 Value Index Fund	NJS	Amex	0.25	Mutual Fund	BGI
MNY	MidCap 500 Index	MNV	Amex	0.25	ETF	Bank of NY
QXKQ	Nasdaq-100 Index Tracking Stock	QXKQ	Amex	0.28	ETF	Bank of NY
SPY	S&P 500	SPY	Amex	0.12	ETF	SSgA
ELG	streetTRACKS Dow Jones US Large Cap Growth Index Fund	DJUNG	Amex	0.20	Mutual Fund	SSgA
ELV	streetTRACKS Dow Jones US Large Cap Value Index Fund	DJUSV	Amex	0.20	Mutual Fund	SSgA
DSG	streetTRACKS Dow Jones US Small Cap Growth Index Fund	DJUSG	Amex	0.25	Mutual Fund	SSgA
DSV	streetTRACKS Dow Jones US Small Cap Value Index Fund	DJUSV	Amex	0.25	Mutual Fund	SSgA
VFI	Total Return Market VIBERS Index Fund	VFI	Amex	0.15	Mutual Fund	Vanguard

**A P P E N D I X**  
**Universe of Domestically Traded Exchange-Traded Index Funds**

Name	Trading Symbol	End-of-Day NAV Symbol	Approx. Average Daily Volume*	Approx. Net Assets \$ mil.	Dividend Frequency	Dividends Reinvested: Y/N	Approx. Expense Ratio %	Primary Exchange	Inception Date	Manager
<b>Style-Based Index Funds</b>										
<b>Large-Cap</b>										
<i>Conc./Dist.</i>										
DIA Diamonds	DIA	DSX.NV	1,138.56	2499.60	M	N	0.38	AMEX	Jan-98	State Street
<i>Tracking Stock</i>										
FORTCNE 500 Index	SPH	JFY.NV	3.95	48.04	Q	Y	0.20	AMEX	Oct-00	State Street
RUSSELL 2000+	ARKI	XRF	20.83	N/A	N/A	N	0.38	AMEX	Aug-01	Black of NY
S&P 500 Total Market	TPY	NLANV	4.68	65.23	Q	Y	0.20	AMEX	Jun-10	Barclays
Russell 1000	FWL	NIR.NV	25.26	281.36	Q	Y	0.15	AMEX	May-00	Barclays
Russell 2000	LWV	NMV.NV	13.16	722.38	Q	Y	0.20	AMEX	May-00	Barclays
S&P 500	OTF	URV	70.30	245.22	Q	Y	0.20	CBOE	Oct-00	Barclays
S&P 500	IVV	ONV.NV	157.36	2577.34	semi-ann	Y	0.09	AMEX	Aug-00	Barclays
S&P 500 Global 100	IGLO	ODV	26.20	119.80	semi-ann	Y	0.20	NYSE	Dec-00	Barclays
Nasdaq 100 Tracking Stock	QQQ	QXV.NV	20104.00	22600.26	Q	N	0.18	AMEX	Mar-99	Bank of NY
S&P 500 SPTX	SPY	SSX.NV	6190.00	30952.83	Q	N	0.12	AMEX	Jan-93	State Street
<i>Smart Beta</i>										
Global Index	EXG	IGT.NV	12.54	21.29	Q	Y	0.50	AMEX	Sep-00	State Street
Vanguard Total Stock Market	VTI	TSXV	290.00	62.66	Q	Y	0.15	AMEX	May-01	Vanguard
<i>Consol.</i>										
Russell 1000 Growth	DWG	NUL.NV	21.50	250.35	Q	Y	0.20	AMEX	May-00	Barclays
Russell 2000 Growth	DW7	NUL.NV	14.30	213.60	Q	Y	0.25	AMEX	Jul-00	Barclays
Russell 2000/BAABA	DW8	NJG.NV	19.72	229.57	semi-ann	Y	0.15	AMEX	May-00	Barclays
<i>Growth</i>										
StreetTRACKs Dow Jones Large-Cap Growth	FLG	FLG.NV	2.26	24.21	Q	Y	0.20	AMEX	Sep-00	State Street
<i>Value</i>										
Russell 1000 Value	IVD	NTE.NV	26.74	306.36	Q	Y	0.20	AMEX	May-00	Barclays
Russell 2000 Value	IVW	NW.NV	1.50	33.80	Q	Y	0.25	AMEX	Jun-00	Barclays
S&P 500 Value/BAABA	DVE	NML.NV	52.48	415.00	Q	Y	0.18	AMEX	May-00	Barclays
<i>Smart Beta</i>										
Russell 1000 Low Vol	FLV	FLV.NV	11.10	36.36	Q	Y	0.20	AMEX	Sep-00	State Street

**APPENDIX** (cont'd)  
**Diverse of Domestically Traded Exchange-Traded Index Funds**

Name	Trading Symbol	Intr-day NAV Symbol	Approx. Average Daily Volume*	Approx. Net Assets \$mil.	Dividend Frequency	Dividends Reinvested Y/N	Expense Ratio %	Primary Exchange	Inception Date	Manager
<b>Stock-Based Index Funds</b>										
<b>MidCap</b>										
<i>Core/Blend</i>										
5Shares S&P MidCap 400	DEI	NIH.NV	18.15	372.86	semi-ann	Y	0.20	AMEX	May-00	Dreyfus
S&P 400 MidCap SPDR	MDY	MDY.NV	832.90	4,043.64	Q	N	0.25	AMEX	May-95	Bank of NY
<i>Growth</i>										
5Shares S&P MidCap 1000	UKK	NIX.NV	23.92	108.49	semi-ann	Y	0.25	AMEX	Jul-00	Barclays
BARCLAY Growth										
<i>Value</i>										
5Shares S&P 400/65/MICRA Value	UJ	NIJ.NV	19.54	137.68	semi-ann	Y	0.25	AMEX	Jun-00	Barclays
<b>Small Cap</b>										
<i>Core/Blend</i>										
5Shares Russell 2000	1RSX	NIK.NV	256.00	974.82	Q	Y	0.20	AMEX	May-00	Dreyfus
5Shares S&P SmallCap 600	SPX	NIK.NV	84.20	413.63	semi-ann	Y	0.20	AMEX	May-00	Barclays
<i>Growth</i>										
5Shares Russell 2000 Growth	TWO	NIU.NV	45.82	213.60	Q	Y	0.25	AMEX	Jul-00	Barclays
5Shares S&P SmallCap 600 Growth	UJG	NET.NV	11.04	47.46	semi-ann	Y	0.25	AMEX	Jun-00	Barclays
5Shares RUSSELL 2000 Dow Jones Small Cap Growth	DSG	PSG.NV	0.54	7.37	Q	Y	0.22	AMEX	Sep-00	State Street
<i>Value</i>										
5Shares Russell 2000 Value	TWN	NAJ.NV	65.75	392.67	Q	Y	0.25	AMEX	Jul-00	Dreyfus
5Shares S&P SmallCap 600 Value	UJS	NIS.NV	21.28	137.75	semi-ann	Y	0.25	AMEX	Jul-00	Barclays
5Shares TRACERS Dow Jones Small Cap Value	TSV	PSV.NV	0.52	20.19	Q	Y	0.25	AMEX	Sep-00	State Street



**A J P E N D I X** (cont'd)  
**Overview of Domestically Traded Exchange-Traded Index Funds**

Name	Trading Symbol	End-of-Day NAV Symbol	Approx. Average Daily Volume*	Approx. Net Assets \$mil*	Dividend Frequency	Dividends Reinvested: Y/N	Approx. Expense Ratio %	Primary Exchange	Inception Date	Manager
<b>Sector-Based Funds</b>										
<b>Basic Materials/Industrial</b>										
Shares Of US Basic Materials	IYM	IXX.NV	1.56	15.50	Q	Y	0.60	AMEX	Jun-00	Ray Iyis
Shares Of US Chemicals	IYC	NNE.NV	3.98	16.78	Q	Y	0.60	AMEX	Jun-01	Barclays
Shares Of US Industrial	IND	NI.NV	1.66	49.66	Q	Y	0.60	AMEX	Jun-00	Barclays
Select Sector SPDR - Precious Metals	XLB	IXX.NV	50.66	113.22	Q	Y	0.28	AMEX	Dec-08	State Street
Select Sector SPDR - Industrial	XLI	IXX.NV	31.80	75.63	Q	Y	0.28	AMEX	Dec-08	State Street
<b>Biotech/Pharma/Healthcare</b>										
ICGDRs Biotech	IBB	IHH	506.50	N/A	N/A	N	0.78	AMEX	Nov-00	Bank of NY
ICGDRs Pharmaceutical	IPH	IPH	71.20	N/A	N/A	N	0.08	AMEX	Feb-01	Bank of NY
Shares Of US Healthcare	IYH	NIHG.NV	38.48	137.91	Q	Y	0.50	AMEX	Jun-00	Barclays
Shares Nasdaq Biotechnology	IBD	IBF.NV	47.48	128.35	**	N	0.55	AMEX	Feb-01	Barclays
<b>Consumer Sector Funds</b>										
ICGDRs Retail	RTH	JRH	5.08	N/A	N/A	N	0.38	AMEX	May-01	Bank of NY
Shares Of US Consumer Cyclical	IYC	NIJ.NV	3.16	36.57	Q	Y	0.50	AMEX	Jun-00	Barclays
Shares Of US Consumer Non-Cyclical	IYK	NMJ.NV	4.16	16.25	Q	Y	0.60	AMEX	Jun-00	Barclays
Select Sector SPDR - Consumer Services	XLV	MXV.NV	3.48	112.26	Q	Y	0.29	AMEX	Dec-08	State Street
Select Sector SPDR - Consumer Staples	XLP	JXV.NV	57.74	239.02	Q	Y	0.27	AMEX	Dec-08	State Street
Select Sector SPDR - Cyclical Transportation	XLY	YXV.NV	27.50	131.77	Q	Y	0.27	AMEX	Dec-08	State Street
<b>Energy</b>										
ICGDRs Oil Service	OIH	OXP	23.94	N/A	N/A	N	0.18	AMEX	Feb-00	Bank of NY
Shares Of US Energy	IYE	NE.NV	35.21	47.53	Q	Y	0.60	AMEX	Jun-00	Barclays
Select Sector SPDR - Energy	XLE	EXV.NV	126.41	341.06	Q	Y	0.28	AMEX	Dec-08	State Street
<b>Financials</b>										
ICGDRs Regional Bank	RBF	YRH	17.28	N/A	N/A	N	0.18	AMEX	Jun-00	Bank of NY
Shares Of US Financial	IYF	NI.F.NV	14.80	60.10	Q	Y	0.60	AMEX	May-00	Barclays
Shares Of US Financial Services	IYG	NAG.NV	2.94	30.36	Q	Y	0.60	AMEX	Jun-01	Barclays
Select Sector SPDR - Financial	XLF	FXV.NV	214.16	762.96	Q	Y	0.27	AMEX	Dec-08	State Street



**APPENDIX (cont'd)**  
**Universe of Domestically Traded Exchange-Traded Index Funds**

Name	Trading Symbol	End-of-Day NAV Symbol	Average Daily Volume <sup>a</sup>	Approx. Net Assets <sup>b</sup>	Dividend Frequency	Dividends Reinvested: Y/N	Approx. Expense Ratio %	Primary Exchange	Inception Date	Manager
<b>Internet</b>										
First Trust F-30	F30	F30	7.14	15.18	Q	Y	0.30	AMEX	Oct-00	State Street
HOLDRs-Internet	BIIX	BIIX	117.78	N/A	N/A	N	0.06	AMEX	Feb-01	Bank of NY
HOLDRs-Broadband	BLBH	BLBH	171.42	N/A	N/A	N	0.08	AMEX	Apr-01	Bank of NY
HOLDRs-Internet	II30	II30	82.86	N/A	N/A	N	0.08	AMEX	Sep-99	Bank of NY
HOLDRs-Internet Architecture	IA31	IA31	24.74	N/A	N/A	N	0.08	AMEX	Feb-00	Bank of NY
HOLDRs-Internet Infrastructure	IIH	IIH	91.30	N/A	N/A	N	0.08	AMEX	Feb-00	Bank of NY
iShares DJ US Internet	IYV	NIYV.NY	11.32	18.95	Q	Y	0.60	AMEX	May-01	Barclays
streetTRACKS										
Morgan Stanley Internet	MI	MMI.NY	3.92	6.86	Q	Y	0.30	AMEX	Sep-00	State Street
<b>Real Estate</b>										
iShares Capital & Stars										
Realty Mgmt	ICQ	ICQ.NV	3.80	61.96	Q	Y	0.30	AMEX	Feb-01	Barclays
iShares DJ US Real Estate	IYR	NIYR.NY	10.26	73.10	Q	Y	0.60	AMEX	Jun-01	Barclays
streetTRACKS Wireless REIT	RWTR	FWTR.NY	0.10	17.80	Q	Y	0.35	AMEX	Apr-01	State Street
<b>Technology</b>										
HOLDRs-Semiconductor	SMTI	XSH	1207.75	N/A	N/A	N	0.08	AMEX	May-01	Bank of NY
HOLDRs-Software	SWT	XCTI	180.74	N/A	N/A	N	0.08	AMEX	Sep-00	Bank of NY
iShares DJ US Technology	IYV	NJW.NY	17.30	99.92	Q	Y	0.60	AMEX	May-00	Barclays
iShares Goldman Sachs Technology	IGM	JPM.NY	11.62	109.17	Q	Y	0.50	AMEX	May-01	Barclays
Street Tracker S&P 500 Technology	XLE	EQV.NY	222.78	1113.12	Q	Y	0.27	AMEX	Nov-98	State Street
streetTRACKS Morgan Stanley High Tech	MTK	JM.L.NY	6.28	67.48	Q	Y	0.50	AMEX	Sep-00	State Street
<b>Telecommunications</b>										
HOLDRs-Telecom-unications	TTH	TTH	79.10	N/A	N/A	N	0.08	AMEX	Feb-00	Bank of NY
HOLDRs-Wireless	WMU	1WU	21.46	N/A	N/A	N	0.08	AMEX	Nov-00	Bank of NY
iShares DJ US Telecommunications	IYJ	NIJ.NY	8.10	51.05	Q	Y	0.60	AMEX	May-00	Barclays
<b>Utilities</b>										
HOLDRs-Utilities	UTH	UTH	107.76	N/A	N/A	N	0.08	AMEX	Jun-00	Bank of NY
iShares DJ US Utilities	IYU	NIU.NY	24.06	63.41	Q	Y	0.60	AMEX	Jun-00	Barclays
Street Tracker S&P 500 Utilities	XLU	USLU.NY	250.06	74.92	Q	Y	0.29	AMEX	Nov-98	State Street



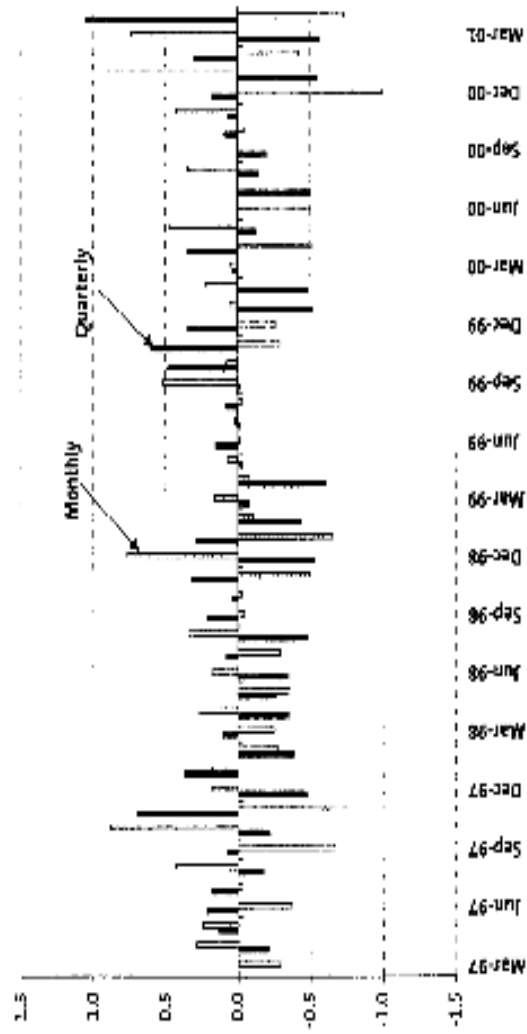
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 P. E. N 17 1 X (cont'd)  
 Name of Domestically Traded Exchange-Traded Index Funds

Trading Symbol	Intr-day NAV Symbol	Average Daily Volume*	Approx. Net Assets \$bil.	Dividend Frequency	Dividends Reinvested: Y/N	Approx. Expense Ratio %	Primary Exchange	Inception Date	Manager
ERT1	ERI	4.26	N/A	N/A	N	0.08	AMEX	Jan-01	Bank of NY
EWGA	GBI	3.74	52.65	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWGO	IN7	0.76	11.32	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWK	INX	0.20	9.47	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWZ	WVZ	3.20	18.17	semi-ann	Y	0.99	AMEX	Jul-90	Barclays
EWCC	WPC	7.22	30.78	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	WWE	10.48	80.60	semi-ann	Y	0.85	AMEX	Jul-90	Barclays
EWQ	WBF	12.64	34.46	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWG	WDG	34.54	126.84	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJH	INH	26.34	59.67	semi-ann	Y	0.83	AMEX	Mar-96	Barclays
EWI	INE	8.96	34.84	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	294.46	388.25	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	32.90	69.65	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	15.36	49.62	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	6.44	23.25	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	12.70	54.05	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	6.60	25.45	semi-ann	Y	0.95	AMEX	Mar-96	Barclays
EWJ	INJ	4.54	27.95	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	9.72	10.93	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	7.28	30.19	semi-ann	Y	0.99	AMEX	Mar-96	Barclays
EWJ	INJ	33.14	122.39	semi-ann	Y	0.84	AMEX	Mar-96	Barclays
EWJ	INJ	10.46	170.84	semi-ann	Y	0.60	AMEX	Jul-90	Barclays
EWJ	INJ	0.18	6.98	semi-ann	Y	0.50	AMEX	Jun-00	Barclays

\* All data as of 6/22/01.



**Exhibit 25: Differences in total return of S&P 500 SPDR (SPY) vs. S&P 500 index**  
 (Monthly and Quarterly, March 1997 – April 2001)



Source: IAMS Information Service and Standard and Poor's.

**Exhibit 26: Total returns and tracking error statistics for most actively traded ETFs**

	Total Returns (%)				Tracking Error		
	Index	ETF	NAV	Index	ETF - NAV - Index	NAV vs. Index	ETF vs. Index
					Mthly	Qtrly	
<b>SPY S&amp;P 500 SPDR</b>					0.07	1.46	0.34
2001 (4/30)	-5.01	4.53	-4.99	0.48			
2000	-9.10	-9.71	-9.14	-0.61			
1999	21.04	20.39	20.84	-0.65			
1998	28.58	28.66	28.33	0.08			
<b>MDY S&amp;P MidCap SPDR</b>					0.28	2.60	2.30
2001 (4/30)	-1.25	-0.94	-0.96	0.30			
2000	21.27	21.87	21.85	0.60			
1999	14.72	15.35	14.01	0.63			
1998	19.12	16.88	18.47	-2.24			
<b>DIA DJIA Diamonds</b>					0.13	1.32	1.13
2001 (4/30)	-0.10	0.80	0.02	0.90			
2000	-6.40	-6.51	-6.38	-0.11			
1999	27.07	27.58	27.00	0.51			
1998	17.92	17.33		-0.59			
<b>QQQ Nasdaq 100 Shares</b>					0.04	2.40	2.03
2001 (4/30)	-20.75	-20.94	-20.79	-0.19			
2000	-36.82	-36.12	-36.94	0.70			
1999*	76.28	74.16	75.83	-2.12			

\* 1998 April - 1999

Note: YTD is as of April 30, 2001

Source: Goldman Sachs Equity Derivatives Research Estimates.



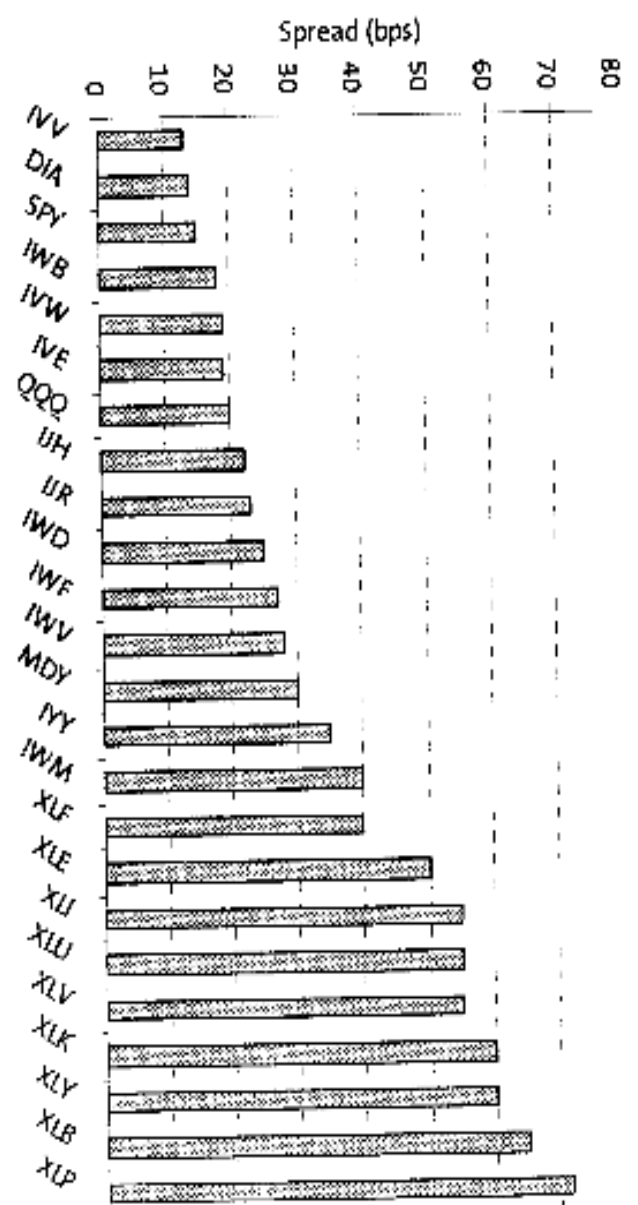
Sector-based Index ETFs			
ETF Tkr	Product Name	Spread <sup>1</sup> (bps)	Depth <sup>2</sup> (mil \$)
XLF	Financial SPDR	40	12.0
XLE	Energy SPDR	50	1.5
XLI	Industrial SPDR	55	3.0
XLU	Utilities SPDR	55	3.2
XLV	Consumer Services SPDR	55	3.0
XLK	Technology SPDR	60	2.8
XLY	Cyclical/Trans SPDR	60	2.8
XLB	Basic Industries SPDR	65	2.0
XLP	Consumer Staples SPDR	72	2.5

Source: Goldman Sachs, May 2001.

**Exhibit 9A: Quoted spread and depth, selected ETFs\***

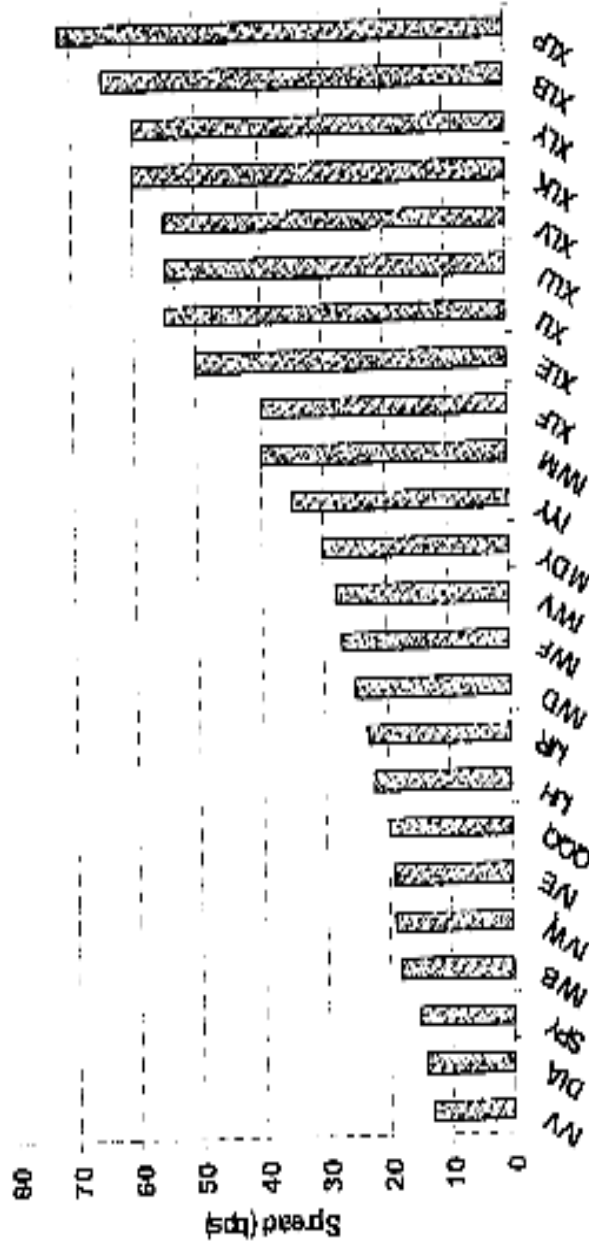
Size and style-based Index ETFs			
ETF Tkr	Product Name	Spread <sup>1</sup> (bps)	Depth <sup>2</sup> (mil \$)
IVV	S&P 500 iShares	13	62.5
SPY	S&P 500 SPDR	15	62.5
IWW	S&P 500 Growth iShares	19	16.0
IVE	S&P 500 Value iShares	19	16.0
DIA	DJIA Diamonds	14	11.0
QQQ	Nasdaq-100	20	1.2
MDY	S&P MidCap 400 SPDR	30	10.0
IJH	S&P MidCap 400 iShares	22	11.0
IJR	S&P SmallCap 600 iShares	23	11.0
IWB	Russell 1000 iShares	18	16.5
IWD	Russell 1000 Value iShares	25	15.0
IWF	Russell 1000 Growth iShares	27	14.0
IWM	Russell 2000 iShares	40	5.0
IWV	Russell 3000 iShares	28	7.0
IYY	DJ US Total Market iShares	35	6.0

**Exhibit 9B: Quoted bid and offer spreads – size-, style- and sector-based ETFs\***





**EXHIBIT 1B**  
**Quoted Bid and Offer Spreads for**  
**Size-, Style- and Sector-Based ETFs\***



\* Based on floor quotes. Spreads may be tighter in the upstairs market for similar size.

Source: Goldman Sachs, May 2001.



**EXHIBIT 1**

**Summary Statistics on UFF Premiums**

IShares MSCI Series Number	Minimum	10th Percentile	50th Percentile	90th Percentile	Maximum
Australia	4.47	-0.45	1.81	3.69	7.92
Austria	1.27	-0.06	0.26	1.25	3.08
Belgium	-2.05	0.34	0.26	0.94	2.74
Canada	-3.45	-0.50	0.22	1.06	3.75
France	-3.52	-0.53	0.14	0.80	3.17
Germany	-4.75	-0.61	0.27	1.11	3.35
Hong Kong	-13.72	-1.18	0.48	2.31	7.44
Italy	-11.27	-0.39	0.11	1.81	4.81
Japan	-5.84	-0.76	0.15	1.32	3.71
Malaysia	0.75	-0.75	1.11	1.65	3.71
Malaysia	-0.87	-1.73	1.16	3.73	7.71
Mexico	-6.87	-1.52	0.55	1.21	6.23
Netherlands	-0.25	0.28	0.28	0.79	3.03
Sweden	-2.74	0.55	1.05	3.42	12.51
Switzerland	-4.64	-0.45	0.20	0.81	3.21
Sweden	-3.11	-0.06	0.31	0.84	0.88
Sweden and Norway	4.12	-0.21	1.45	3.24	3.51
U.K.	-6.17	-0.58	0.32	1.75	3.71
U.S.	-5.81	-0.38	0.38	1.51	3.34

**EXHIBIT 4**  
**Comparison of Capital Gain Distributions (US\$)**

	SPDRs	Vanguard S&P500 Fund
2000	0.00	0.00
1999	0.00	1.00
1998	0.00	0.42
1997	0.00	0.59
1996	0.09	0.25
1995	0.00	0.13
1994	0.00	0.20
1993	0.00	0.03

Sources: American Stock Exchange and Morningstar.