

The Short Side of 130/30 Investing for the Conservative Portfolio Manager

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Many long-only investment managers have watched the financial industry's growing enthusiasm for what are formally called enhanced long strategies or constrained long-short portfolios with a mixture of interest and concern. The most common label for these portfolios, 130/30, anticipates that the portfolio manager's investment process will select long positions equal to 130% of the nominal capital invested and offsetting short positions equal to 30% of that nominal capital, for a net market exposure of 100%. It is convenient to use 130/30 as a shorthand label for various implementations of this investment method.

The premise behind 130/30 and its cousins—from 120/20 to 200/100—is that most institutional investment processes evaluate a broad range of investment opportunities. If client portfolios are limited to long positions, any negative information the manager accumulates is used only to exclude unattractive positions from portfolios. Consequently, clients do not get the full benefit of all the manager's research, because the long-only manager cannot take a short position.

The theoretical grounding for 130/30 portfolios and calculations describing how the underlying investment process can add value by leveraging longs and using information now "wasted" to select short positions is well developed.¹ Both theoretical models and empirical evaluation of 130/30 portfolios that have been

in operation for a few years provide ample support for the notion that this long-short structure is a better way for many investment managers and their clients to approach equity investment.

Jacobs and Levy [2007b] provide insights on a number of 130/30 issues not addressed here. The basic principles are highly simplified for my purposes here, but are developed in full mathematical glory in Grinold and Kahn [2000a, 2000b], Jacobs, Levy, and Starer [1999] and Sorensen, Hua, and Qian [2007].

My specific purpose is to describe how a conservative portfolio manager with little or no experience in short-selling can use the sector evaluations from her firm's investment process to add alpha with short positions in exchange-traded funds (ETFs).

There are a number of reasons an investment manager might use sector ETFs rather than individual stocks as the short components in an initial 130/30 product offered to clients. Some portfolio managers do not welcome the added flexibility of a 130/30 model because they are not used to evaluating the risks and rewards of the short side of investing. Viscerally, managers may overestimate upside risks or simply be uncomfortable with upside company-specific risks. From an operations perspective, a long-only manager is accustomed to looking at cash balances and trade management in ways that may not be fully compatible with an integrated long-short portfolio.

Probably the single most important objection likely to be raised to integrated long-short portfolio management is that the manager's investment process information is not organized to support the analysis and the risk management of short positions in individual stocks. For example, there may be no buy-back discipline for short positions that is comparable to the firm's sell discipline for long positions.

These are all valid concerns for some managers, but it is possible for an investment organization to approach short-selling in an incremental way, even if a firm has not organized the collection and integration of negative company information into its security selection and risk management systems. Most large investment organizations have well-developed policies on the relative attractiveness of various market segments including large-cap versus small-cap, value versus growth and, most significantly for my purposes, the relative attractiveness of various market sectors.

Exhibit 1 shows the range of typical performance differences that can be achieved in some common ways of segmenting active management choices. As intuition would suggest, individual stock selection has the greatest potential to add value, but the difference in performance among various domestic sectors is a relatively close second. When the dispersion in sector performance is combined with some advantages of using exchange-traded funds to implement short sector positions, the use of sector ETFs to establish the short side of a 130/30 position can be a compelling choice for investment managers unprepared for fully integrated long-short stock portfolios. Some

sector ETFs are easy to trade, easy to borrow, and easy to integrate as the short side of a long-short portfolio.

WHY NOW?

Investor and investment manager interest in 130/30 portfolios is partly a response to the popularity of hedge funds. The public interest in 130/30 portfolios, in particular, and in hedging activities, in general, provides investment managers an opportunity to expand their offerings of above-average fee products—products that can generate more revenue and better client performance with modest incremental operating costs.

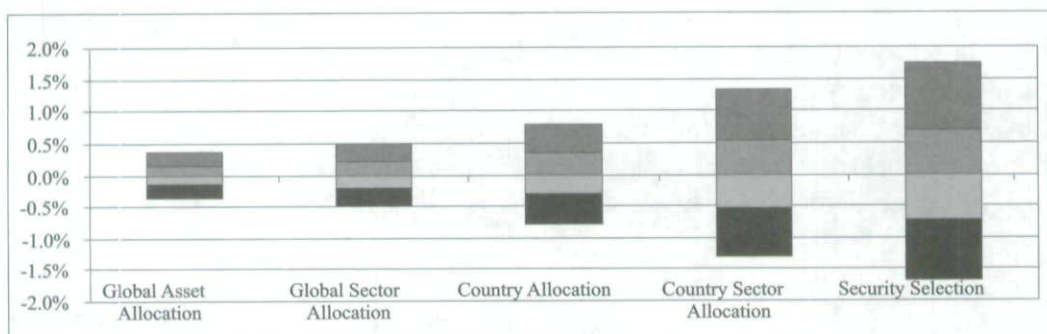
WHY USE SECTOR ETFs?

At least one ETF in each of a number of U.S. domestic sectors offers unique opportunities for efficient implementation of short positions without concern for some of the problems often associated with short-selling:

- For institutional-sized accounts, borrowing sector ETF shares to sell short is simple and low in cost.
- There is an extraordinarily remote possibility of a short squeeze or a surprise increase in securities borrowing costs.
- The dispersion of returns for the selected active management choices illustrated in Exhibit 1 reflects the opportunity set available to an active manager. Domestic sector selection provides return dispersion closer to individual security selection than the other active management choices.

EXHIBIT 1

Return Dispersion for Selected Active Management Choices



Source: Kritzman and page [2003].

Note: Shaded bands show 5th, 25th, 75th, and 95th percentile performance over a consistent horizon.

- Some small companies with doubtful operating records and prospects have objected volubly that short-sellers are "attacking" their stocks. The managers of these companies have created ongoing distractions for fund managers who have shorted their stock (see McLean and Hajim [2005]). If the manager's short position is in an exchange-traded fund, there is no link between the short position and a specific company's stock. While the managers of ETFs are sometimes ambivalent about short-sellers, they like the active trading that the sales and repurchases of short-sellers generate and they recognize that active trading and tight trading spreads make their funds more attractive to long investors.

SHORT-SELLING OPERATIONS

A detailed plan for implementing a 130/30 program with sector ETFs as the short side is beyond the scope of this article, but a few comments are appropriate. Depending largely on the custody options open to a specific institutional client, either a prime brokerage account or a traditional margin account will be used. The principal operating advantage of short-selling sector ETFs is the ease and low cost of borrowing the necessary ETF shares.

One of the greatest misunderstandings in ETF short-selling is the belief that ETF shares are difficult to borrow. It is true that a small investor who wants to sell short a few hundred or a few thousand shares of an ETF will frequently be told by a broker that the shares are hard to borrow. It is also true that if a large investor asks about borrowing 100,000 ETF shares, the answer will nearly always be that the shares are available for prompt delivery against a short sale.

What is going on here? The answer is simple. Securities borrowing and lending is a labor-intensive process by securities industry standards, and a small stock loan transaction is rarely worth a broker's effort. Exchange-traded fund shares, however, can be created in nearly unlimited quantities.

Market makers in ETFs will readily create shares in most ETFs for the express purpose of lending the shares. If shares must be created to lend, the cost of borrowing them may be slightly higher than the general collateral rate that would apply to the loan of an S&P 500 component stock. Any added cost to borrow shares in an ETF will be a function of the effect of the fund expense ratio on the

securities lender's costs. Rates may vary, depending on the natural availability of shares to lend in a specific ETF.

Other than the noted effect of the expense ratio if shares must be created to lend, ETF shares are neither hard nor expensive to borrow.

WHICH SECTOR ETFs?

I examine ETFs in 11 popular domestic sectors largely defined by the Global Investment Classification System (GICS) developed jointly by Standard & Poor's (S&P) and Morgan Stanley Capital International (MSCI) and used in the construction of those index publishers' sector indexes.

Most U.S. investment managers organize their securities research around the sector and industry classifications of the GICS sector and industry breakdowns. Furthermore, the U.S. domestic sector ETFs that have the most assets, the greatest trading liquidity, and the most active short-selling are generally based on the GICS. The differences between the GICS and its principal rival, the Industry Classification Benchmark (ICB), developed and supported by Dow Jones Indexes and the FTSE Group, are not substantial for most sectors.

The division between Consumer Discretionary and Consumer Staples under the GICS and between Consumer Services and Consumer Goods under the ICB standards is probably the most significant classification difference we encounter in the sector ETFs.

The GICS standards attempt to capture the cyclicity of consumer demand by emphasizing the deferrable or discretionary nature of purchases from the companies in the Consumer Discretionary Sector. The ICB standards focus on whether the company is delivering products or services.

The discretionary or cyclical emphasis in the GICS puts building products retailers and other providers of deferrable services in the Consumer Discretionary Sector, while the ICB focus on services includes essentially all retailers and other providers of services in Consumer Services and makes no attempt to focus on the economic sensitivity of the business of a particular retailer. The most important differences are that Walmart, CVS-Caremark, and Walgreen are among the top-ten holdings of the Sector SPDR Consumer Staples fund and among the top ten holdings of the iShares Dow Jones Consumer Services fund.

Of the three major families of sector index exchange-traded funds, the Sector SPDRs are based entirely on stocks

in the Standard & Poor's 500. As S&P is one of the creators of GICS, the indexes underlying the Sector SPDR portfolios are consistent with the GICS sector definitions. The Vanguard sector index funds are based on a family of MSCI indexes covering a broad capitalization range of the U.S. market including approximately 2,500 stocks, five times the number of securities in the S&P 500, but stocks in the S&P 500 account for about 80% of the capitalization weight of the average MSCI sector index underlying the Vanguard sector funds.

The other major domestic sector ETFs are the iShares Dow Jones sector funds based on the ICB industry classification and collectively including about 1,500 stocks, intermediate between the 500 in the Sector SPDRs and the 2,500 in the Vanguard sector funds. The presence of smaller companies gives some small- and midcap exposure to the Vanguard and iShares sector funds, and tends to slightly increase the costs of borrowing their portfolio securities. The presence of these smaller companies also increases the trading spread in the basket used to create and redeem the Vanguard and iShares funds and increases the trading spread in the market for the exchange-traded fund shares. Also, when small-cap stocks outperform large-cap stocks, the Vanguard and Dow Jones sector funds will tend to do better than the Sector SPDRs. When large-cap stocks outperform small-caps, the Sector SPDRs will be the better performers.

Beyond these three ETF families, there are many additional market segment ETFs based on custom indexes that hold securities selected in different ways and with unusual stock weighting schemes. With the exception of the real estate sector or industry, we stick largely to these three ETF families, because their portfolios approximate float-weighting, and the sector definitions are close to the definitions used by research departments. If a portfolio manager has a strong, negative case for a subsector or an industry covered by an ETF, the issues discussed here apply to shorting most ETFs.

There is no material risk of a short squeeze in any approximately float-weighted exchange-traded fund because more ETF shares can always be created by depositing a basket of the securities in the fund's portfolio composition file (PCF) with the fund custodian.²

Exhibit 2 compares the assets of the Sector SPDRs (generally the largest sector ETFs) to the floating capitalization of their respective S&P 500 sectors. In no case does a Sector SPDR hold as much as 3/4 of 1% of the

EXHIBIT 2
Sector SPDRs Portfolio Assets as a Percentage of Underlying Securities' Float (all \$ in millions as of July 31, 2007)

Trading Symbol	Consumer Discretionary	Consumer Staples	Energy	Financial	Healthcare	Industrial	Materials	Technology	Utilities	S&P 500
	XLX	XLP	XLE	XLF	XLV	XLI	XLB	XLK	XLU	
Float of Underlying Stocks	\$1,299,484	\$1,206,983	\$1,427,699	\$2,580,488	\$1,498,945	\$1,495,095	\$424,634	\$2,560,146	\$449,347	\$12,942,822
Assets of Sector SPDR	\$512	\$1,643	\$4,802	\$2,702	\$1,952	\$1,589	\$1,130	\$2,390	\$3,236	\$19,957
Sector SPDR as % of Float	0.0394%	0.1361%	0.3363%	0.1047%	0.1303%	0.1063%	0.2661%	0.0934%	0.7202%	0.1210%

Source: S&P, Spdrindex.com, American Stock Exchange.

float of any single stock. Only the Utilities Sector SPDR holds much more than 1/3 of 1% of the float of any stock.

While borrowing shares is not a problem in carrying short positions in any of these funds, the Sector SPDRs illustrate the absence of borrowing risks most clearly. Between 10% and 12% of the floating stock in *every company* in the S&P 500 is held in committed indexed portfolios, making the securities in the S&P 500 extraordinarily easy and cheap to borrow.

Except in highly unusual circumstances (e.g., an oversubscribed self-tender for a company's stock or an unusual proxy battle), stock lending premiums are extremely rare in S&P 500 stocks. Stock loan premiums on smaller stocks in some of the iShares or Vanguard sector portfolios are more common. Premiums to borrow these smaller-capitalization stocks may raise borrowing costs slightly in the iShares or Vanguard sector ETFs, but the ability and cost to borrow any of these ETF shares will rarely be an issue for an institutional account.

Each Sector SPDR pays expenses of 23 basis points to the Sector SPDR Trust to pay for operation of the funds. A short-seller of the ETFs might retain the benefit of some of this fee as part of the return to the short position, but it is likely that the effect of the fee will be passed on to the lender of the fund shares if shares are created to lend.

The Vanguard funds' expense ratio is only 2 basis points higher, at 25 basis points, but the cost of assembling the basket of stocks in the Vanguard funds and the probability of a stock loan premium on some of the smaller-cap issues make it cost slightly more to borrow the Vanguard sector shares than the Sector SPDRs.

The stocks in the Dow Jones Sector indexes and the corresponding iShares sector fund portfolios have securities lending characteristics that fall between the Sector SPDRs and the Vanguard funds. The expense ratios of the iShares sector funds are the highest in the group at 48 basis points, increasing the cost to borrow shares that are created to lend. As we will see when we examine the funds in each sector, the short interest figures suggest that short-sellers are generally most comfortable using Sector SPDRs.

A typical exchange-traded fund has a short interest of 10 to 20 times the short interest of the average New York Stock Exchange-listed company, and the short interest in many funds is much higher than that. A large short interest does not usually indicate that short-sellers expect an ETF portfolio to underperform other ETFs in the same sector.

SECTOR ETF DATA

An investment manager planning to use a sector fund as the short side of a 130/30 strategy should consider the data items provided in the exhibits for each group of sector funds. The columns from left to right in Exhibits 3–13 provide the fund's trading symbol; its assets (in millions of dollars) as of July 13, 2007; the consolidated trading volume during 2006 (in millions of shares); the reported short interest in July 2007, expressed as a percentage of the number of fund shares outstanding in mid-July; and the 2006 tracking error in basis points as computed by Morgan Stanley Research.

EXHIBIT 3

Consumer Discretionary Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR— Consumer Discretionary	XLY	\$744	292	71%	-19
iShares DJ Consumer Services	IYC	\$293	10	20%	-55
Vanguard Consumer Discretionary	VCR	\$110	4	8%	-27

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

The Consumer Discretionary Sector (using the GICS names for categorization) consists of three funds: the Sector SPDR Consumer Discretionary fund, the iShares Consumer Services fund, and the Vanguard Consumer Discretionary exchange-traded shares.

A few general comments on interpreting these data may be useful, taking the Consumer Discretionary Sector in Exhibit 3 a source of examples. The assets of each fund reflect the value of the shares issued by the fund. Because short-selling involves borrowing shares from one holder of the shares and selling them to another holder, the total number of shares appearing in investor accounts (including the accounts of market makers and other professionals) will be increased by the number of shares borrowed and sold short.

In the case of the Sector SPDR Consumer Discretionary fund, the \$744 million in assets held by the fund as of July 13 should be multiplied by 1.71, representing the shares issued by the fund plus the shares provided to investors by short-sellers to get a value for shares held by investors of \$1,272 million. (This value does not appear in Exhibit 3.)

When fund size is adjusted by the effect of the short interest, most Sector SPDRs funds are even larger relative to their competition than when size is measured by the shares issued by the fund.

The annual volume figures for 2006 stated in millions of shares can be converted easily to average daily trading volume. For each million shares traded in 2006, the daily volume was an average of about 4,000 shares. So, in the case of the Sector SPDRs Consumer Discretionary fund, the 292 million shares traded during the year translate into approximately 1,168,000 shares per day.

The average daily trading volume in the iShares Consumer Services fund shares was about 40,000 shares, and the average daily volume in the Vanguard Consumer Discretionary shares was about 16,000 shares.

It is not impossible to trade the less actively traded funds in large size, but there is obviously less customer order flow, and the quality of the market depends heavily on the efforts of specialists and market makers.

The 2006 tracking error is simply the difference in total return between the fund and its template or benchmark index for calendar 2006. As a very rough generalization, if the index complies with the diversification standards for a regulated investment company (RIC), as these three indexes do, the tracking error will tend to be close to the expense ratio of the fund.³

If the index is RIC-compliant, the tracking error number can be a useful but rough indicator of the effectiveness of a fund portfolio manager. In some sectors, particularly in energy and telecommunications, and occasionally in industrials and consumer staples, the portfolios for the iShares and Vanguard sector funds may not match the composition of the index, usually because the index is not RIC-compliant. All the Sector SPDR indexes have been modified from the standard float-weighted S&P sector indexes, if necessary, to maintain diversification-compliant index compositions.⁴

In the Consumer Discretionary Sector in Exhibit 3, it is clear that the dominant fund used by most short-sellers is the Sector SPDRs Consumer Discretionary fund. It has by far the highest trading volume and the greatest short interest of the three funds in this category.

The Consumer Staples category (Exhibit 4) is dominated by the Sector SPDR Consumer Staples fund. It is

EXHIBIT 4

Consumer Staples Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Consumer Staples	XLP	\$1,735	396	10%	-66
iShares DJ Consumer Goods	IYK	\$350	19	8%	-59
Vanguard Consumer Staples	VDC	\$324	5	1%	+78

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 5

Energy Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Energy	XLE	\$4,837	5807	59%	-28
iShares DJ US Energy	IYE	\$1,139	31	2%	-230
Vanguard Energy	VDE	\$658	12	4%	-204

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

notable that this sector has attracted relatively little short-selling, but even here the Sector SPDRs dominate it.

In the Energy Sector (Exhibit 5), the sector most significantly affected by the absence of RIC compliance in the iShares and Vanguard indexes, we find, not surprisingly, the highest volume and the most assets in the Sector SPDR Energy fund. At times in recent years, the short interest and the total assets in the Energy Sector SPDR have fluctuated dramatically as traders have used the shares as a convenient energy sector proxy. The nearly 6 billion shares traded in 2006 (about 23 million shares on an average day) illustrates the liquidity in these shares.

The Financial Sector (Exhibit 6) is characterized by high trading volume and a large short interest in the Financial Sector SPDR. Trading volume has been even higher in 2007, reflecting uncertain valuations from the impact

of questionable loan quality on the fortunes of financial sector firms.

Note that the 115% short interest indicates that if the shorts were not providing additional securities to various investors, the assets of the Sector SPDR Financial ETF might be close to \$4 billion. This is an overstatement of the long position, because some of the long position was probably created to obtain ETF shares for lending to short-sellers.

The Healthcare Sector (Exhibit 7) is characterized by somewhat lower trading volume and lower short interest than most other sectors. The tracking errors for all these funds are close to the fund expense ratios.

The Industrial Sector (Exhibit 8) is similar to the Healthcare Sector in share volume with fewer assets. The short interest percentage is slightly higher. As in the other

EXHIBIT 6

Financial Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Financial	XLF	\$1,856	1986	115%	-39
iShares DJ Financial Sector	IYF	\$493	8	5%	-62
iShares DJ Financial Services	IYG	\$252	9	11%	-25
Vanguard Financials	VFH	\$306	5	2%	-61

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 7

Healthcare Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Healthcare	XLV	\$2,067	317	22%	-26
iShares DJ US Healthcare	IYH	\$1,258	36	8%	-41
Vanguard Healthcare	VHT	\$451	10	<1%	-23

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 8

Industrial Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Industrial	XLI	\$1,400	355	29%	-30
iShares DJ US Industrial	IYJ	\$356	8	9%	-65
Vanguard Industrials	VIS	\$216	4	3%	+42

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 9

Materials Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Materials	XLB	\$1,361	878	124%	-52
iShares DJ Basic Materials	IYM	\$691	27	18%	-64
Vanguard Materials	VAW	\$323	3	5%	-31

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

sectors, the Sector SPDR is the favorite of both long investors and short-sellers.

The Materials Sector (Exhibit 9) is unremarkable except for the relatively high short interest percentage in the Sector SPDR Materials ETF.

The Technology Sector (Exhibit 10) is interesting for a number of reasons. The Technology Sector SPDR has respectable assets at \$2.5 billion, and significant trading volume, but the short interest is modest.

The short interest *percentage* is higher in the iShares Goldman Sachs Technology Index ETF, an ETF based

EXHIBIT 10

Technology Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Technology	XLK	\$2,454	480	7%	-22
iShares DJ US Technology	IYW	\$905	31	2%	-55
iShares Goldman Sachs Technology	IGM	\$370	19	35%	-53
Vanguard Information Technology	VGT	\$378	7	4%	-26

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 11

Utilities Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
Sector SPDR Utilities	XLU	\$3,566	835	34%	-37
iShares DJ US Utilities	IDU	\$865	17	6%	-58
Vanguard Utilities	VPU	\$326	5	1%	-13

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

EXHIBIT 12

Telecommunications Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
iShares DJ US Telecommunications	IYZ	\$1,122	91	2%	-446
Vanguard Telecommunications	VOX	\$297	6	3%	-61

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

on a custom index. The iShares Goldman Sachs Technology fund at \$370 million in assets has certainly received reasonable acceptance in the marketplace. Its 35% short interest percentage is smaller in dollar value than the 7% short interest in the much larger Tech-

nology Sector SPDR. The higher relative short interest in the Goldman Sachs fund probably reflects the fact that the Sector SPDR Technology fund is not a pure technology fund.

EXHIBIT 13

Real Estate Sector

Fund	Symbol	Assets (\$ millions) July 13, 2007	2006 Volume (million shares)	July 2007 Short Interest %	2006 Tracking Error (bp)
iShares DJ US Real Estate	IYR	\$1,599	510	198%	-26
iShares Cohen & Steers Realty Majors	ICF	\$2,328	69	7%	-83
DJ Wilshire REIT	RWR	\$1,241	19	13%	-46
Vanguard REIT	VNQ	\$1,602	27	1%	-2

Source: Fund websites, American Stock Exchange, Bloomberg, and Morgan Stanley Research "Exchange-Traded Funds" [2007].

In addition to technology, the Sector SPDR Technology fund includes telecommunications sector stocks in the S&P 500. The reason for this unusual feature is that there were not enough telecommunications stocks in the S&P 500 when these ETFs were launched to populate a separate telecommunications fund. About 17% of the assets in the Sector SPDR Technology ETF today are telecommunications shares.

It is possible that the lack of short-selling in the technology sector reflects the diversity of the very large technology sector, but it would be interesting to see how a "pure" Technology Sector SPDR might attract assets and trading volume—and short-sellers.

The Utilities Sector (Exhibit 11) is similar in most respects to the other sectors in terms of dominance by the Sector SPDR in assets, volume, and short interest. The current short interest is about average for this fund by recent standards.

The Telecommunications Sector (Exhibit 12) funds are relatively modest in size, trading volume, and short interest. The large negative tracking errors, especially in the iShares Dow Jones US Telecommunications ETF, are attributable to the fact that the underlying indexes are not RIC-compliant. Hence, the fund portfolio and the index look very different.

The Real Estate Sector (Exhibit 13) is not a sector in the same GICS categorical sense as the other sectors. Real estate investment trusts (REITs) are included in the Financial Sector under the GICS sector attributions. Consequently, the companies in the REIT funds and their underlying indexes will, to the extent they qualify for the

respective financial sector indexes, be held by the Financial Sector ETFs as well as by the REIT funds.

It is interesting to see that in the absence of a Sector SPDR, there is still a dominant fund in terms of both trading volume and short interest. In this case, the dominant trading and shorting fund is the iShares Dow Jones Real Estate ETF. The iShares Cohen & Steers fund has the most assets.

ENDNOTES

¹See Bernstein [2003, 2004]; Clarke, de Silva, and Thorley [2002]; Ennis [2001]; Fabozzi [2004]; Grinold and Kahn [2000a, 2000b]; Jacobs and Levy [1993, 2006, 2007]; Jacobs, Levy, and Markowitz [2006]; Jacobs, Levy, and Starer [1999]; Maginn et al. [2007], and Sorensen, Hua, and Qian [2007].

²Creations and redemptions of ETF shares are typically made *in kind*. Baskets of portfolio securities are deposited with the fund in exchange for fund shares in a creation. In a redemption, fund shares are turned in to the fund in exchange for a basket of portfolio securities. The creating or redeeming investor—in most cases, a market maker in the ETF shares—is responsible for the costs of investing in the portfolio securities for deposit and the cost of disposing of portfolio securities received in the redemption of outstanding fund shares. The market maker expects to pass these transaction costs on to investors when he trades fund shares on the exchange.

The cost of entering and leaving a fund varies, depending on the level of fund share trading activity and the nature of the securities in the fund's portfolio. For example, the cost of trading in small-cap stocks can be much higher than the cost of trading in large-cap stocks. The bids and offers for an ETF's shares will generally reflect the costs of creation or redemption, as appropriate.

For more information on creation and redemption, see

Gastineau [2001], Gastineau [2002, pp. 62–72], or the prospectus or Statement of Additional Information (SAI) for the particular ETF.

³Fund total return minus index total return is consistent with the definition used by Morgan Stanley Research in “Exchange-Traded Funds” [2007], but for some purposes, Morgan Stanley uses the absolute value of tracking error in its aggregate calculations. Tracking error is defined in different ways for different purposes. For a more comprehensive discussion of tracking error, see Gastineau [2005, pp. 132–139].

⁴Under Subchapter M of the Internal Revenue Code, a Registered Investment Company (SEC terminology) must qualify as a Regulated Investment Company (RIC) (IRS terminology) in order to pass through dividend and interest income and net realized capital gains without taxation at the fund level. Regulated Investment Company requirements consist largely of certain portfolio diversification rules. For most equity funds, the relevant diversification requirement consists of having no single issuer’s securities account for more than 25% of the assets of the fund and, with respect to 50% of the assets of the fund, having the securities of no issuer account for more than 5% of the fund’s assets. There are some nuances as to when and how diversification is measured, but they are not significant for most purposes. Occasionally, a fund will fail to qualify for tax-free pass-through of income and realized gains, but such failures are extremely rare.

If ETFs are based on non-RIC-compliant indexes, their portfolios are constructed using a process called “optimization” or representative sampling. The non-RIC-compliant security weightings in the index are simply changed to RIC-compliant weightings in the fund. As a consequence of this change in weightings, these funds do not track their benchmark indexes very closely, making it difficult to evaluate the performance of the fund and the fund manager.

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