Exchange Traded Funds (ETFs)

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Introduction to ETFs
I. ETF Fundamentals
II. ETF Growth
III. ETF Users
IV. ETF Primary and Secondary Markets

Strategies using ETFs
I. Core/Satellite
II. ETF Overlay on pure Alpha portfolios
III. Sector Strategies
IV. Shorting ETFs
V. Distilling Alpha in L/S portfolios
Introduction to ETFs
I. ETFs Are Index Funds Which Are Listed & Traded Like a Stock on Major Stock Exchanges Globally

- ETFs Behave Like Any Other Shares on the Exchange...
  - Can be bought, sold short and/or lent out
  - Trade intra-day across various exchanges (NYSE, LSE, DB, Euronext)
  - Have on-exchange and OTC market makers

- …But Provide Exposure Like an Index
  - Constructed to reflect performance of a benchmark
  - Offer diversification reducing stock-specific risks
  - Are completely transparent portfolio holdings
  - Have low expense ratios
  - Are open-ended with a creation/redemption feature that helps drive liquidity

ETFs are not Derivatives
## I. How Are ETFs Used?

<table>
<thead>
<tr>
<th>Strategic</th>
<th>Tactical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market Exposure</strong>: Implement wide variety of investment strategies using a broad range of market exposures</td>
<td></td>
</tr>
<tr>
<td><strong>Directional Views</strong>: Establish broad directional market position, use long &amp; short trades to implement market view(s)</td>
<td></td>
</tr>
<tr>
<td><strong>Core Satellite</strong>: Achieve strategic focus</td>
<td></td>
</tr>
<tr>
<td><strong>Rebalancing</strong>: Correct drift in a portfolio’s asset allocation or style</td>
<td></td>
</tr>
<tr>
<td><strong>Completion</strong>: Add uncorrelated instruments and/or asset classes to strategy</td>
<td></td>
</tr>
<tr>
<td><strong>Interim Beta</strong>: Maintain exposure to given market while searching for specific market opportunity</td>
<td></td>
</tr>
<tr>
<td><strong>Cash Management</strong>: Able to invest cash rapidly and cost effectively to gain desired market exposures</td>
<td></td>
</tr>
<tr>
<td><strong>Derivatives Alternative</strong>: Broad opportunity set of Delta 1 exposures with single line cash based settlement</td>
<td></td>
</tr>
<tr>
<td><strong>Exposure Management</strong>: Easily shift portfolio emphasis by adjusting exposures (e.g. duration, credit)</td>
<td></td>
</tr>
<tr>
<td><strong>Thematic</strong>: Implement thematic exposures (e.g. dividends, alternatives)</td>
<td></td>
</tr>
</tbody>
</table>
### I. Why Are ETFs Used?

<table>
<thead>
<tr>
<th>Transparency</th>
<th>Investors know the ETF composition at any given time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidity</td>
<td>ETFs offer two sources of liquidity</td>
</tr>
<tr>
<td></td>
<td>- Traditional liquidity measured by secondary market trading volume</td>
</tr>
<tr>
<td></td>
<td>- The liquidity of the underlying via the creation and redemption process</td>
</tr>
<tr>
<td>Diversification</td>
<td>ETFs provide immediate exposure to a basket or group of securities for instant diversification</td>
</tr>
<tr>
<td></td>
<td>Broad range of asset classes including equities, bonds, commodities, Investment Themes etc</td>
</tr>
<tr>
<td>Flexibility</td>
<td>ETFs are listed on exchanges and can be traded at any time the market is open</td>
</tr>
<tr>
<td></td>
<td>Pricing is continuous throughout the day</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
<td>ETFs offer a cost-effective route to diversified market exposure (139 benchmarks)</td>
</tr>
<tr>
<td></td>
<td>The average total expense ratio (TER) for equity ETFs in Europe is 46 bps versus 100 bps (per annum) for the average equity index tracking fund and 191 bps (per annum) for average active equity fund¹</td>
</tr>
<tr>
<td>Securities Lending</td>
<td>ETF units and underlying assets can be lent out to potentially offset holding costs</td>
</tr>
</tbody>
</table>

¹. Lipper Fitzrovia (December 2006)
II. ETF Growth: The Global ETF Market Has Experienced Strong Growth Since 2000

Global ETF Market Growth (AUM & No. of Funds)

Global ETF AUM Is Forecast to Reach $2Tr by 2011

Global CAGR (2000-2007) = 37%
Europe CAGR (2000-2007) = 113%
US CAGR (2000-2007) = 36%

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II. ETFs Today Provide a Broad Range of Potential Exposures

US ETF Assets by Type of Exposure

- Large Cap: 28%
- International: 29%
- Sector: 12%
- Growth: 7%
- Value: 6%
- Fixed Income: 6%
- Broad Market: 4%
- Mid-Cap: 4%
- Small Cap: 4%
- Commodities: <1%
- Custom: <1%

European ETF Assets by Type of Exposure

- Fixed Income: 14%
- Commodity: 3%
- Global: 3%
- Country (US): 2%
- US Sector: >1%
- European Sector: 6%
- Regional: 6%
- Style: 7%
- International/E: 14%
- Regional Eurozone: 20%

Source: Morgan Stanley Investment Strategies, Bloomberg
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III. ETF users: More Institutional Users are Using ETFs

- Strong year-on-year growth in Institutional users - across both US and Europe

- Growth fuelled by:
  - Increasing familiarity with ETFs
  - Increasing availability of ETFs & Improving liquidity
  - Continued product innovation

- Strong growth continuing through 2007

**Growth of Institutional Users of ETFs**

Source: Thomson Financial, Morgan Stanley Investment Strategies
III. Hedge Funds Have Only Started to Use ETFs

- Current trends:
  - 36% increase in the number of hedge funds using ETFs over the past year
  - 66% increase of average daily global ETF shares traded (2007 YTD)
  - 131% increase of average daily global ETF value traded (2007 Q1-Q3)

Number of Hedge Funds Holding ETFs

IV. ETF Primary and Secondary Markets
# IV. Delta 1 Products Comparison

<table>
<thead>
<tr>
<th></th>
<th>ETFs</th>
<th>Futures</th>
<th>Swaps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Round trip execution costs</strong></td>
<td>Commission</td>
<td>Commission</td>
<td>None if held to expiry; break fee on notional</td>
</tr>
<tr>
<td><strong>Holding cost</strong></td>
<td>Total Expense Ratio</td>
<td>Roll</td>
<td>Financing</td>
</tr>
<tr>
<td><strong>Tracking error</strong></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Minimum trade size</strong></td>
<td>1 share</td>
<td>1 contract</td>
<td>Variable on exposure</td>
</tr>
<tr>
<td><strong>Expiry</strong></td>
<td>No</td>
<td>Quarterly</td>
<td>Fixed</td>
</tr>
<tr>
<td><strong>Available to lend</strong></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Legal structure</strong></td>
<td>Fund</td>
<td>Derivative</td>
<td>Derivative</td>
</tr>
<tr>
<td><strong>Liquidity provided</strong></td>
<td>Exchange / Multiple dealers</td>
<td>Exchange / Multiple dealers</td>
<td>Single dealer</td>
</tr>
</tbody>
</table>
### Lending inside ETF fund

<table>
<thead>
<tr>
<th>Client</th>
<th>BGI/iShares custodian</th>
<th>Borrower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying shares deposited with custodian</td>
<td>Lending fee is rebated into iShares Funds*</td>
<td></td>
</tr>
<tr>
<td>Individual securities lent out</td>
<td></td>
<td>Borrower pays lending fee</td>
</tr>
</tbody>
</table>

**Lending the underlying assets**

All iShares investors benefit from Securities Lending returns inside iShares funds where possible

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### Lending ETF units

<table>
<thead>
<tr>
<th>Client</th>
<th>Lending agent/custodian</th>
<th>Borrower</th>
</tr>
</thead>
<tbody>
<tr>
<td>iShares put in Securities Lending programme</td>
<td>Lending revenue received</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Borrower pays lending fee</td>
</tr>
</tbody>
</table>

**Lending iShares units**

iShares investors may lend out their iShares units to generate extra revenue
IV. Case Study: Double Benefit of Sec Lending

Lending the assets inside the fund and the iShares units can help offset the TER

Source (Returns inside the fund): BGI, most recent audited financials (US audited 31/08/07, DJ Euro Stoxx 50 30/09/2006, all other Dublin iShares as of 28/02/07). (Units returns): BGI and Performance Explorer, information on www.performanceexplorer.com (10/2007). Figures represent the gross lending yield pre-split and any applicable fees. The terms of the lending arrangement between the iShares units holder and the lending agent/custodian is at their discretion. The rates represent current market levels and are subject to market forces. Past and current performance is not an indication of the future.
IV. Lending of iShares Units

- There is an active lending market for iShares as demonstrated by the high market on-loan balances

- iShares units are increasingly becoming a popular shorting alternative

- High lending yield generated for assets in difficult to borrow markets (e.g. MSCI Emerging Markets, MSCI Brazil)

- Lending liquidity is higher in the US market (on loan balances)

<table>
<thead>
<tr>
<th>European iShares *</th>
<th>AUM (US$M)</th>
<th>Market on-loan balance (US$M)**</th>
<th>Current Lending Yield***</th>
<th>TER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTSE 250</td>
<td>$605.19</td>
<td>$313</td>
<td>0.67%</td>
<td>0.40%</td>
</tr>
<tr>
<td>FTSE 100</td>
<td>$3,706.58</td>
<td>$247</td>
<td>0.27%</td>
<td>0.40%</td>
</tr>
<tr>
<td>DAX (DE)</td>
<td>$5,047.01</td>
<td>$254</td>
<td>0.17%</td>
<td>0.15%</td>
</tr>
<tr>
<td>DJ EURO STOXX 50</td>
<td>$6,101.29</td>
<td>$141</td>
<td>0.32%</td>
<td>0.35%</td>
</tr>
<tr>
<td>MSCI Emerging Markets</td>
<td>$1,753.79</td>
<td>$45</td>
<td>0.21%</td>
<td>0.75%</td>
</tr>
</tbody>
</table>

### IV. European ETF Trading Volumes Example

#### Top 10 Traded ETFs by Volume

<table>
<thead>
<tr>
<th>ETF Description</th>
<th>Trading Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>iShares DAX (DE)</td>
<td>200M</td>
</tr>
<tr>
<td>Lyxor ETF DJ Euro Stoxx 50</td>
<td>152M</td>
</tr>
<tr>
<td>iShares DJ Euro Stoxx 50</td>
<td>149M</td>
</tr>
<tr>
<td>Lyxor ETF DAX</td>
<td>73M</td>
</tr>
<tr>
<td>iShares FTSE 100</td>
<td>69M</td>
</tr>
<tr>
<td>Lyxor ETF CAC 40</td>
<td>63M</td>
</tr>
<tr>
<td>iShares DJ Euro Stoxx 50 DE</td>
<td>61M</td>
</tr>
<tr>
<td>Lyxor Gold Bullion Securities</td>
<td>32M</td>
</tr>
<tr>
<td>XACT Bear</td>
<td>28M</td>
</tr>
<tr>
<td>ITRIX DJ Euro Stoxx 50</td>
<td>27M</td>
</tr>
</tbody>
</table>

European ETFs do not break into the top 10 traded equities by volume eg top 3 equities:

- ENI SpA (c. 2.1B)
- Banco Santander (c. 2.0B)
- Telefonica (c. 1.9B)

However, top European ETF funds are as tradable as major stocks within the top 100 ranks such as:

- Unilever (206M)
- Sainsbury (193M)
- Cadbury (192M)

The secondary market volumes are small but increasing.

Trading Volume ≠ Liquidity

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All numbers are in US$.  
Source: Bloomberg, All data as of as of 31 October 2007, average daily trading volume
IV. And a Note on Primary Market Liquidity...

<table>
<thead>
<tr>
<th>iShares Primary Market Activity</th>
<th>Current AUM (Equity + Fixed Income)</th>
<th>Net Activity 2007</th>
<th>Gross Activity 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US$58.2B</td>
<td>US$8.1B</td>
<td>US$61.5B</td>
</tr>
</tbody>
</table>

None of this flow is traded directly with BGI – majority is traded OTC with sell side dealers

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ETFs Offer Solutions for a Range of Portfolio Strategies

| Portfolio Construction | 1. Fill allocations required by investment strategy  
|                        | 2. Improve diversification  
|                        | 3. Gain exposure to size, style, yield, sector, geography |
| Portfolio Management   | 1. Implement short-, long-term and/or neutral market views  
|                        |   - Hard to access asset classes, themes, sector, country  
|                        |   - Tactical Asset Allocations |
| Strategic Asset Allocations | 1. Establish core holdings  
|                             | 2. Establish single country or sector satellites |
| Risk Control             | 1. Active risk budgeting  
| Cash Equitization        | 2. Combine ETFs in managing total portfolio volatility or duration adjustments in fixed income portfolios  
|                        | 3. Manage inflows, outflows, transitions  
|                        | 4. Obtain a wider exposures than offered by other Delta 1 products |
| Exposure                | 1. Exposures to markets or asset classes where one has no expertise or operational capabilities |

1. Lipper Fitzrovia (December 2006)
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Investment Strategies Using ETFs

I. Core/Satellite

II. Sector Strategies

III. ETF Overlay on pure Alpha portfolios

IV. Shorting ETFs

V. Distilling Alpha in L/S portfolios
I. Core-Satellite: Optimal Way to Combine Passive and Active Management

Global Portfolio Return

\[ \alpha \omega \ast \text{Satellite} + \beta (1 - \omega) \ast \text{Core} \]

- **Actively Managed**
  - Typically invested in less efficient markets
  - Requires specialized expertise

- **Passively Managed**
  - Typically made up of pure index product
  - Less efficient

Due to restrictive constraints, managers might only be allowed to deviate slightly from their benchmark.

As a result, only a limited part of the portfolio is actively managed.

The essential part of the portfolio passively replicates the benchmark.
I. Core-Satellite: ETFs Can be Used in the Core Portfolio, As Well As In the Satellite

- **ETF(s) in the Core:**
  - A broad market index (DJ Euro Stoxx 50, MSCI World, iBoxx Government Bond)
  - Exposure to diversified baskets of securities
  - Optimized Core: sector, style or country indices

- **ETF in the Satellite:**
  - Concentrated, focused ETFs:
    - Sector and style
    - Individual countries and regions
    - Alternative asset class
I. Core-Satellite: ETFs Can Enhance Risk Adjusted Portfolio Returns

**Core**
- **Optimal strategic asset allocation decisions (betas):** allow investors to achieve optimal trade-off
- **Objective:** generate lowest possible risk for given expected return

**Satellites**
- **Active investment decisions (alphas):** aim at shifting the efficient frontier
- **Objective:** outperform the reference benchmark for a given level of risk

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**Return**
- Core + Satellite
- Active satellites
- Optimized Core
- Original Core Portfolio

**Risk**
I. Core-Satellite Portfolio Construction

### Core Portfolio

- Top-Down/Bottom Up Portfolio composition

- Volatility = 10.17
- Annualized Return = 13.52%

### Optimized Core Portfolio

- North America
- UK
- Japan
- Europe ex-UK
- Pacific ex Japan

- Volatility = 9.89
- Annualized Return = 13.18%

### Optimized Core + Satellite Portfolio

- North America
- UK
- Japan
- Europe ex-UK
- Oil & Gas
- EM
- MidCap
- EU ex UK

- Volatility = 10.67
- Annualized Return = 18.19%
I. Core-Satellite: ETFs Can Enhance Risk Adjusted Portfolio Returns

![Graph showing the returns of different portfolios including Original Portfolio, Optimised Core Portfolio, Optimised Core + Satellite Portfolio, Mid Cap Satellite, Emerging Markets Satellite, and Oil & Gas Satellite. The graph is sourced from BGI.](source: BGI)
II. Sector Investing With ETFs

- Active portfolio managers tend to have a top down/bottom up approach to the equity market valuations for stock selection.

- Sectors follow cyclical patterns and managers:
  - Focus research efforts on favourable sectors from top down valuations to pick stocks.
  - Gain exposure and manage risk vs less favourable sectors by purchasing stocks with the larger market weights in the sector.

- Stock picking strategy is not risk free: individual stock portfolio could under or over perform the intended exposure.
II. Sector Strategies: ETFs or Single Securities?

Source: Banca IMI (banca del gruppos Intesa Sanpaolo, May 2007)

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II. Sector Strategies: ETFs or Single Securities?

Source: Banca IMI (banca del gruppo Intesa Sanpaolo, May 2007)
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II. Sector ETFs: Enhance Risk/Return Profile, Remove Probability of Tracking Error

Exposure to a Whole Sector in a Single Trade

Source: Banca IMI (banca del gruppos Intesa Sanpaolo, May 2007)

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Active Portfolio Managers are constantly required to prove their alpha generating skills with a risk adjusted framework

- Emergence of more “unconstrained” mandates with a varying range of wide tracking errors

- Some managers have adopted a “pure alpha” investment process

- Risk is managed via an overlay fund of ETFs and other Delta1 instruments
III. ETF Overlay on Pure Alpha Portfolio

Initial Portfolio

ETF Overlay

Final Portfolio

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IV. ETFs in Long/Short Portfolios (130/30):

- Finding Alpha is Challenging
- Long only portfolios: typically less than 50% are Alpha bets
- Short only portfolio: 100% Alpha bets but with potentially unlimited stock specific risk
  - Adding 30% short position to a long portfolio with 50% Alpha bets increases risk by 60%
IV. Long/Short Strategy: Historically Cross-Section Returns Show Persistent “Fat Tails”


MS Research Summary:

- There is a higher probability of extreme returns than expected
- Outlier returns have a significant impact on excess return
- Management and identification of outliers is an integral part of investment process
- Active Extension may resemble a core-satellite approach: overweight high conviction stocks, underweight systematic instruments (e.g. sector exposure) via ETF
IV. Long/Short Strategy: Limit Risk by Going Short Exposure via ETF

- Shorting experience has led to more disciplined portfolio management

- Manager differentiation comes from optimal combination of risk management and Alpha generation:
  - ETFs can provide greater diversification and risk control on the short side
  - ETFs can be used to hedge many portfolio characteristics (e.g. style, size, sector)
Where Else Can ETFs Be Incorporated?

- Gain directional exposure to implement macro views
- Match the long portfolio characteristics (market, sector, etc.) by shorting ETFs in a Market Neutral strategies
- Balance Beta/Common Factor exposures without effecting stock selection views
- Dynamically adjust portfolio biases
- Obtain desired exposure to hard to access markets/asset classes (EM, regions, commodities, etc.)
Hedge Funds Return Decomposition

Total Hedge Fund Return

Cash Return

Excess Return

Common Factor Return
(Betas)

Residual Specific Return
(Alpha)

- Sector Risk
  (biotech, energy, etc)
- Macro Factor Risk
  (oil, interest rate, etc)
- Micro Factor Risk
  (size, style, P/E, etc)

Common Factor Risk represents forces that are not linked to the market risk, but still have a common influence on subgroups of stocks.
V. Case Study: Short ETF Implementation in European Long / Short portfolio

Initial Portfolio Characteristics

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>Risk (% Std Dev)</th>
<th>Contribution (to Active Risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Portfolio</td>
<td>$ 190,097,153</td>
<td></td>
</tr>
<tr>
<td>Short Portfolio</td>
<td>$ (93,369,906)</td>
<td></td>
</tr>
<tr>
<td>Net Portfolio</td>
<td>$ 96,727,247</td>
<td></td>
</tr>
<tr>
<td>Total Active Risk</td>
<td>17.56</td>
<td>100%</td>
</tr>
<tr>
<td>Common Factor Risk</td>
<td>15.91</td>
<td>82.13%</td>
</tr>
<tr>
<td>Covariance * 2</td>
<td>N/A</td>
<td>18.65%</td>
</tr>
<tr>
<td>Asset Selection</td>
<td>7.42</td>
<td>17.87%</td>
</tr>
</tbody>
</table>

Benchmark Cash
V. Portfolio Industry Risk Exposures

GICS Sector Exposures

- Main exposure to insurance sector

Exposures (%)

- Consumer Discretionary: 5.03%
- Consumer Staples: -17.44%
- Energy: 8.30%
- Financials: 68.30%
- Health Care: -5.23%
- Industrials: 0.04%
- Information Technology: 2.21%
- Materials: 10.08%
- Telecommunication Services: 8.39%
- Utilities: 20.31%
V. Portfolio Risk Index Exposures

Risk Index Exposures

- Foreign Exposure: -0.13
- Growth: -0.04
- Leverage: -0.37
- Market Sensitivity: 0.64
- Momentum: -0.21
- Size: 0.61
- Value: 1.45
- Variability: -0.13
- Yield Risk Index: 1.04

Highest common factor risks: Look for hedging possibilities

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### V. Hedging with iShares DJ Euro Stoxx 600 Insurance

<table>
<thead>
<tr>
<th>Amount in ETF (as % of Net Portfolio)</th>
<th>Active Risk %</th>
<th>Asset Selection Risk %</th>
<th>Asset Selection Risk (% of Total Risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>17.56</td>
<td>7.42</td>
<td>17.85</td>
</tr>
<tr>
<td>-10%</td>
<td>16.04</td>
<td>7.39</td>
<td>21.23</td>
</tr>
<tr>
<td>-20%</td>
<td>14.59</td>
<td>7.40</td>
<td>25.72</td>
</tr>
<tr>
<td>-30%</td>
<td>13.25</td>
<td>7.46</td>
<td>31.70</td>
</tr>
<tr>
<td>-40%</td>
<td>12.04</td>
<td>7.54</td>
<td>39.22</td>
</tr>
<tr>
<td>-50%</td>
<td>11.02</td>
<td>7.67</td>
<td>48.44</td>
</tr>
<tr>
<td>-60%</td>
<td>10.22</td>
<td>7.83</td>
<td>58.70</td>
</tr>
<tr>
<td>-70%</td>
<td>9.68</td>
<td>8.03</td>
<td>68.81</td>
</tr>
<tr>
<td>-80%</td>
<td>9.51</td>
<td>8.22</td>
<td>74.71</td>
</tr>
</tbody>
</table>

- Reduces Common Factor Risk
- Increases Asset Selection Risk

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V. Hedging with iShares DJ Euro Stoxx Value

<table>
<thead>
<tr>
<th>Amount in ETF (as % of Net Portfolio)</th>
<th>Active Risk %</th>
<th>Asset Selection Risk %</th>
<th>Asset Selection Risk (% of Total Risk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>17.56</td>
<td>7.42</td>
<td>17.85</td>
</tr>
<tr>
<td>-20%</td>
<td>16.32</td>
<td>7.36</td>
<td>20.34</td>
</tr>
<tr>
<td>-40%</td>
<td>12.79</td>
<td>7.19</td>
<td>31.60</td>
</tr>
<tr>
<td>-60%</td>
<td>10.78</td>
<td>7.13</td>
<td>43.75</td>
</tr>
<tr>
<td>-80%</td>
<td>9.09</td>
<td>7.09</td>
<td>60.84</td>
</tr>
<tr>
<td>-100%</td>
<td>8.11</td>
<td>7.08</td>
<td>76.21</td>
</tr>
<tr>
<td>-110%</td>
<td>7.96</td>
<td>7.09</td>
<td>79.34</td>
</tr>
</tbody>
</table>
V. Impact of ETFs Hedging On Active Risk

For illustrative purposes only

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Questions?
Conclusion

- ETFs are a major global product category and are expected to continue to grow to $2T AUM by 2011*

- ETFs provide transparent & liquid exposure to a range of market segments

- ETFs can be used for both strategic and tactical purposes

- ETFs remain a relatively ‘young’ product category – so their full potential is yet to be developed…. 

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