WILSHIRE

third quarter 1999

Setting New Standards in Fund Sponsor Information Systems and Investment Technology

The Wilshire Compass

Annual Technology Seminar-

Please be sure to mark your calendars for the Wilshire Compass Annual Technology Seminar, May 1-3, 2000. The three-day seminar will be held at the Kiawah Island Resort, 30 miles south of Charleston, South Carolina. Seminar brochures including reservation and registration information will be sent within the coming months. We will keep you posted as more details become available. Please feel free to call any of the Compass team members with your suggestions for investment topics.

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Building Standardized Style Universes - U.S. Equity Module.

The key task in building manager peer universes is identifying a collection of firms that share distinct investment styles or approaches. Given the important role that particular asset class styles and strategies play in determining portfolio returns, users need to segregate managers according to asset specific characteristics such as market capitalization, style, sector focus, quality focus, and regional and country biases before drawing any conclusions from the analysis. For instance, comparing a large value equity manager's returns or characteristics to a universe of growth and small-cap equity managers will invariably communicate misleading signals about a manager's relative performance.

Compass now includes standardized universes within the *U.S. Equity*, *Non U.S. Equity,* and *Fixed Income* modules. The standardized universes are constructed according to predetermined rules that rely on *both* holdings- and returns-based characteristics. Managers must comply with both sets of rules before they are included in Wilshire's standardized universes. Consequently, Wilshire's universes will often contain fewer managers than conventional universes that rely on less rigorous eligibility requirements. However, because the standardized universes are "purer", Wilshire believes they provide a more accurate depiction of manager performance within specific investment styles and strategies and, therefore, are a better tool for evaluating relative manager performance.

The standardized U.S. Equity universes encompass the following equity styles: large value, large growth, large core, mid value, mid growth, mid core, small value, small growth, and small core. The Non U.S. Equity universes encompass the following regional strategies: EAFE, global, and emerging markets. The Fixed Income universes encompass the following sector and duration strategies: core, defensive, long, mortgage, high yield, and municipal.

Creating a Standardized Style Universe

To begin the process, click on the US Equity button from the main *Compass* menu and then click on the Screen Database tab. Next, click on the drop down list box under *Product Information* and select *Wilshire Universes. (See Figure 1.)*

Within the set-up screen, select a style universe (e.g., Large Growth) and a quarterly date range. Finally, click the OK button to conclude the process. The criteria, "Wilshire Universe = "Large Growth" from 06/30/1999 to 09/30/1999" will appear in the *Selected Criteria* box. *(See Figure 2.)*

Now that the criteria have been established, click on the Screen button. A dialog box will appear with the number of

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FIGURE 1: THE MAIN COMPASS MENU

BUILDING STANDARDIZED STYLE UNIVERSES (continued from page 1)

managers that comprised Wilshire's Large Growth universe for the third quarter of 1999. Selecting "Yes" will automatically add the managers to the *Managers Selected* box under the Select Managers tab.

Building a Universe Graph

Peer group comparisons are useful tools for comparing manager performance and other portfolio characteristics. The universe analytic in *Compass* allows users to rank portfolio returns or characteristics for up to ten managers over as many as five different time periods, or over rolling periods.

The first step in building a universe graph is selecting a group of managers to serve as the basis for the return or characteristic comparison. Customized groups of managers can be developed using the menus under the Select Managers tab, or by using the *Screen Database* utility. The example below uses Wilshire's Large Growth universe created according to the steps described above.

Create a Total Return Graph in Eight Steps:

1. From the main *U.S. Equity* screen, click on the *Universe* button.

2. Select up to ten managers or indexes to be plotted and ranked on the universe graph by double clicking on each manager/index within the *Select Managers/Select Indices* box.

3. Choose either the *Floating Bar* or *Rolling Periods* graph option and click once on the OK button.

4. If the *Rolling Periods* option is selected, choose the characteristic to be analyzed from the *Returns/Characteristic* box by double clicking on the data item. Next, select the number of *Rolling Quarters*, choose a *Percentile Option*, and set the date range to the desired time period. Click OK to produce the universe graph.

5. If the *Floating Bar* option is selected, choose either the *Single Period, Multiple Characteristics* or the *Multiple Periods, Single Characteristic* option. If the *Single Characteristic, Multiple Periods* option is chosen, double click on the desired data item within the *Returns/Characteristics* box. If the *Multiple Characteristics, Single Period* option is chosen, users can select up to five characteristics by double clicking on the desired data items.

6. Choose the time periods to be analyzed by double clicking on the desired period within the *Periods Ending* box. Users have the option of using the default settings (i.e., *Quarter*, *One Year*, *Year-to-date* etc.) or building customized time periods using the *Custom* option.

7. Select the preferred percentile sequence within the *Percentile Option* box.

8. Click on OK to produce the universe graph. (See Figure 3.)

The red bars in Figure 3 represent the return distributions of Wilshire's Large Growth universe over the four periods selected. The managers and indices selected are represented as symbols on each of the four bar graphs. The horizontal lines within each bar graph represent the percentile sequence selected and the numbers to the left of each bar depict the return associated with each percentile (e.g., for the One Year time period, returns of 40.38% and 46.70% represented the 25th and 10th percentiles, respectively. The middle line in each bar graph depicts the 50th percentile, or median manager, return over each time period.

The values to the right of each manager/index at the bottom of

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FIGURE 2: SCREEN BY CRITERIA

FIGURE 3: UNIVERSE COMPARISON

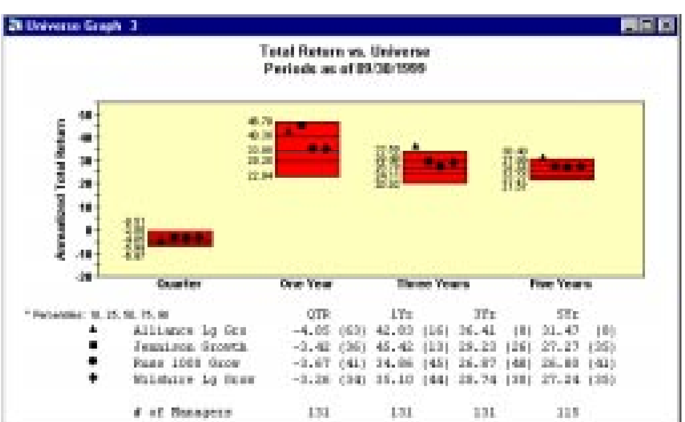
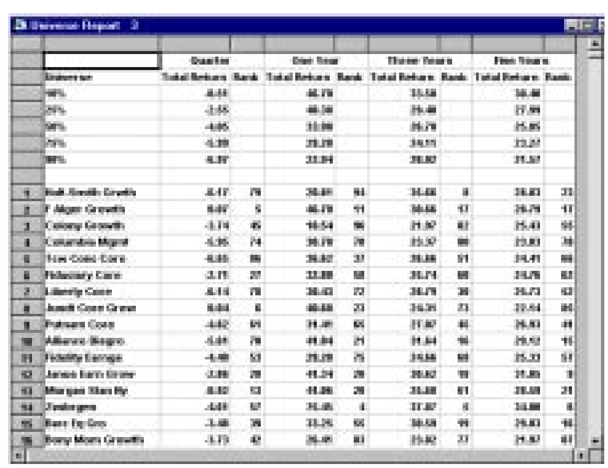


FIGURE 4: UNIVERSE REPORT



HOLDINGS-BASED ATTRIBUTION MODEL
FIXED INCOME

The October 14th *Compass* update included a new fundamental (holdings-based) fixed income attribution analytic. This enhancement allows users to identify how much of a fixed income mangers' excess return is a result of style, interest rate anticipation (duration bets), and issue selection and trading. The attribution results are summarized graphically with details provided via the *Default Report*.

To run the analytic, first select a fixed income manager and then from the Analytics screen select Attribution. At the *Attribution Analysis* set-up screen select Holdings Based Fundamental and click on OK. (See Figure 1.)

At the *Attribution Options* screen, select a Manager, a Style Benchmark, a Market Benchmark and the date range, then click on OK to produce the attribution analysis graph.

Figure 2 shows a total excess return (Manager-Market Benchmark) of 4.29%. Of the total, 2.38% is due to the manager's style (i.e. "high yield" outperformed the Market Benchmark over this time period). Interest rate anticipation, the manager's duration relative to the Style Benchmark's duration, negatively impacted the manager's return by 0.75%. The contribution from Selection and Trading was a positive 2.66%.

The *Manager Attribution Data Report* (Figure 3) provides quarterly detail as well as the total results over the selected time period. This report is available by selecting *Report* and *Default* from the command menu.

The report is comprised of eight columns, each defined as follows:

1. Period End - indicates the quarterly periods used in the analysis.

2. Market Benchmark - quarterly returns for the index selected as the Market Benchmark, in this example - the Lehman Aggregate Bond Index.

3. Style Benchmark - quarterly returns for the user-selected Style Benchmark, in this example - the Salomon Brothers High Yield Bond Index.

4. Style - represents the style specific return, calculated as the arithmetic difference between the Style Benchmark return and the Market Benchmark return.

5. Manager's Return - Quarterly returns for the manager selected, Oaktree High Yield in this example.

FIGURE 2: MANAGER ATTRIBUTION

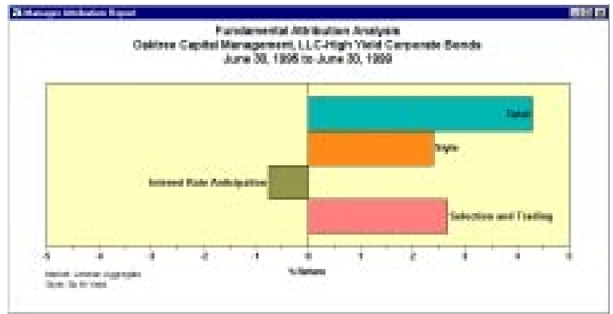
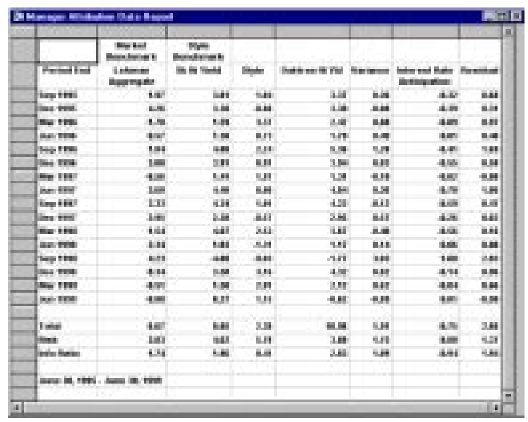


FIGURE 3: ATTRIBUTION REPORT

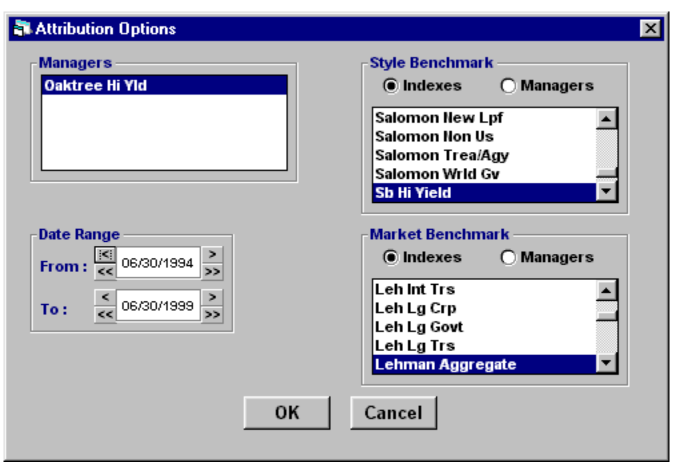


6. Variance - The arithmetic difference between the Manager's return and the Style Benchmark's return.

7. Interest Rate Anticipation - The portion of the manager's excess return that is attributable to duration differences between the style benchmark and the manager. (Calculation is detailed below)

8. Residual - The portion of the manager's excess return that results from issue selection and trading.

FIGURE 1: ATTRIBUTION ANALYSIS



The Interest Rate Anticipation (IRA) component of the attribution is calculated as follows:

$$IRA=DASBr-SBr$$

$$DASBr=TBillr+[(MgrDur/SBDur)x(SBr-TBillr)]$$

Where:

IRA= Interest Rate Anticipation

DASBr=Duration-adjusted style benchmark return

SBr=Style Benchmark return

TBillr=T-Bill return

MgrDur= Manager's effective duration from prior quarter end

SBDur= Style Benchmark's effective duration from prior quarter end

HOLDINGS-BASED ATTRIBUTION MODELS

U.S. EQUITY- FUNDAMENTAL DETAILS

The new equity *Quarterly Detail* attribution analytic in *Compass* utilizes portfolio holdings to perform accurate performance attribution on manager portfolios. This model allows users to evaluate the impact that certain portfolio-level decisions have on the portfolio's ultimate value-added or excess return. Specifically, the attribution analytic details the consequences of decisions relating to style, cash holdings, sector selection, and individual stock selection *over a specific quarter.*

Users have the flexibility to choose a style benchmark from a list of thirty-two well-known U.S. equity benchmarks as the basis for the attribution analysis. Once a manager, style benchmark, and time horizon have been selected, the attribution model generates four separate graphs displaying the attribution results.

Total vs. Market – This return represents the difference between the manager's total portfolio return and the broad equity market, which is defined as the Wilshire 5000 Index. (See Figure 1.)

Style Component – This return represents the difference between the Wilshire 5000 Index and the manager's style benchmark. The manager's style benchmark is typically selected by the fund and is defined as the index that best represents the manager's normal style over time. The manager's style benchmark serves as the basis for the remaining attribution analysis.

Total vs. Benchmark – This return represents the total return difference between the manager and the style benchmark selected. (See Figure 2.)

Market Timing – This return reflects the impact of the managers' decision to hold cash in their portfolio. The market timing return is defined as the difference between the manager's total return and the manager's equity return. The manager's equity return is simply the return the portfolio would have earned if it had been 100% invested in equities over the period.

Market Timing Return = Manager Total Return – Manager Equity Return

Manager Equity Return = $(Rtn_{Mgr}-(Rtn_{T\text{-}Bill}*\%Cash_{Mgr}))/(1-\%Cash_{Mgr})$

Sector Selection – This is the return attributable to the manager's sector weighting decisions. It is defined as the sum of the positive and negative contributions from each individual sector weighting decision. The sector selection return reflects the manager's ability to add value by tactically over and under weighting sectors relative to the style benchmark. (See Figure 3.)

Sector Selection Return = $\Sigma_{\text{Sector Wgt i-j}}(\text{Sector Wgt}_{Mgr}-\text{Sector Wgt}_{\text{Style Index}})*(\text{Sector Rtn}_{\text{Style Index}}-\textit{Total}\ \text{Rtn}_{\text{Style Index}})$

Where:
Sector Wgt_{Mgr}= Beginning of Period Manager Sector Weights

$\text{Sector Wgt}_{\text{Style Index}}$= Beginning of Period Style Index Sector Weights

Stock Selection - This is the return attributable to the manager's selection of specific stocks within each sector. The total stock selection return is the sum of the positive and negative contribution from stock selection within each individual sector. The stock selection return reflects the manager's ability to add value by purchasing those stocks which perform better than the sector index as a whole while avoiding those stocks which perform worse than the sector index.

Stock Selection Return = $\Sigma_{\text{Sector Wgt i-j}}\ \text{Sector Wgt}_{Mgr}*(\text{Sector Rtn}_{Mgr}-\text{Sector Rtn}_{\text{Style Index}})$

FIGURE 1: ATTRIBUTION vs. MARKET

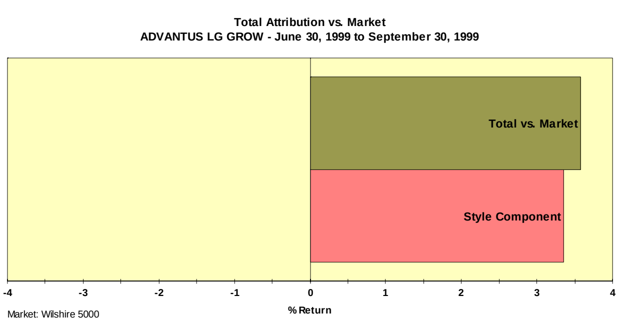
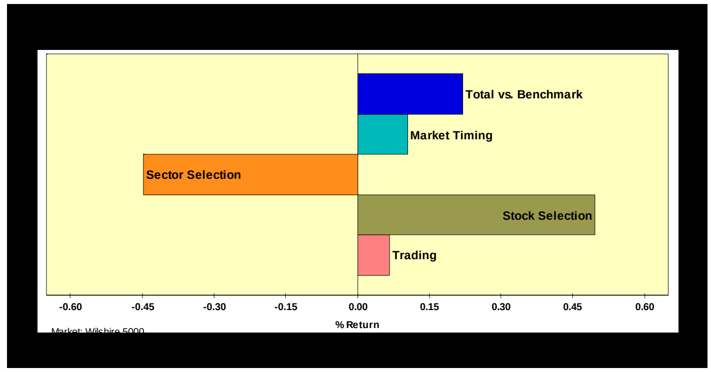


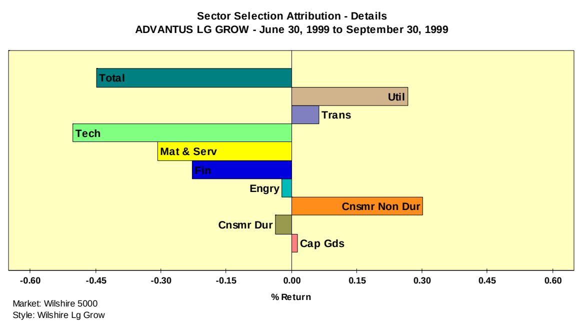
Figure 1 displays how the manager's style (as reflected by its style benchmark) performed relative to the overall equity market, which is defined as the Wilshire 5000 Index. Over short time periods, return differentials between various style benchmarks and the overall market can be significant; however, over long time horizons, Wilshire expects these return differentials to approximate zero.

FIGURE 2: ATTRIBUTION vs. BENCHMARK



This graph displays the impact that each of the four main portfolio decisions - market timing, sector selection, stock selection, and trading - had on the managers' over or under performance relative to their style benchmark.

FIGURE 3: SECTOR ATTRIBUTION



This graph displays the positive and negative contributions to return from each individual sector weighting decision. As mentioned above, the sum of all nine individual sector returns equal the total sector selection return shown in Figure 2. The individual returns can be viewed by clicking on each bar in the graph.

(continued on page 5)

HOLDINGS-BASED ATTRIBUTION MODELS

U.S. EQUITY- FUNDAMENTAL SUMMARY

The U.S. Equity Fundamental Summary Attribution has been enhanced to further delineate sources of a managers excess return over time. *In contrast to the Fund Details report, this report allows users to view the attribution factors over multiple quarterly periods.*

The new analytic includes both a graph and an underlying report that attributes return differences between the manager and the manager's benchmark to four components: Market Timing, Sector Weighting, Stock Selection, and Trading.

Market Timing represents the return impact of any cash holdings in the portfolio.

Sector Selection identifies the amount of excess return attributable the manager's weighting to each of nine sectors relative to the benchmark's sector weights.

Stock Selection measures the manager's ability to add value purely from stock selection within each of the nine sectors.

Trading measures return due to trading during the quarter. It is the difference between the portfolio's quarterly equity-only return and the quarterly buy and hold return.

The "Total" provides a summary over the time period selected. The derivation of the Totals includes calculating and allocating the effect that compounding has on each of the individual components.

FIGURE 1

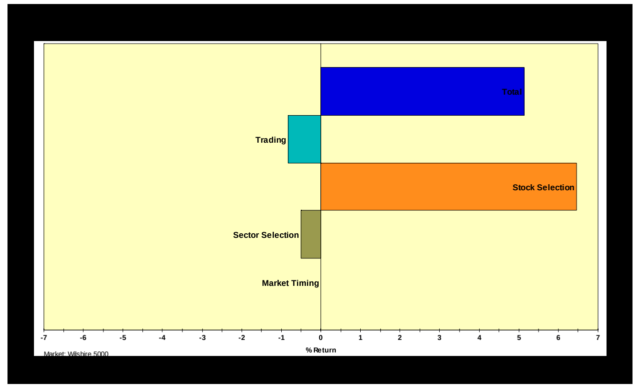


FIGURE 2

CAP GUARD US VAL
September 30, 1998 - September 30, 1999

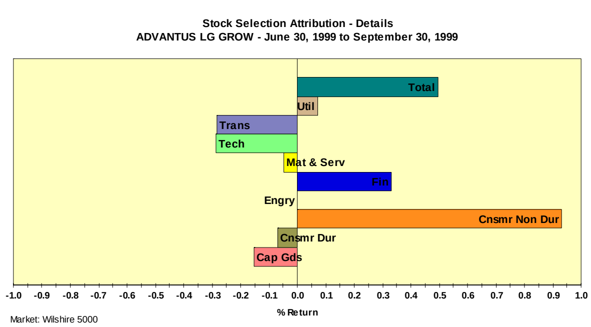
	Market Benchmark Wilshire 5000	Style Benchmark Wilshire Lg Valu	Style Return	Manager Total Return	Manager Equity Return	Return Due to Timing	Sector Selection	Stock Selection	Trading
Dec-98	21.52	17.25	-4.27	17.24	17.24	0.00	-1.52	2.24	-0.72
Mar-99	3.77	0.94	-2.83	3.59	3.59	0.00	-0.79	3.43	0.01
Jun-99	7.80	11.68	3.88	14.03	14.03	0.00	1.43	1.18	-0.26
Sep-99	-6.61	-10.05	-3.44	-10.45	-10.45	0.00	0.33	-0.88	0.15
Total	26.95	18.89	-8.06	24.02	24.02	0.00	-0.51	6.46	-0.83

U.S. EQUITY- FUNDAMENTAL DETAILS (continued from page 4)

Trading –This is the return attributable to the manager's trading activity over the course of the evaluation period.

Trading Return = Total Return$_{Mgr}$ - Total Rtn$_{Style\ Index}$ - Mgr Rtn$_{Mkt\ Timing}$ - Mgr Rtn$_{Sctr\ Selection}$ - Mgr Rtn$_{Stock\ Selection}$

FIGURE 4: STOCK ATTRIBUTION



This graph displays the positive and negative contributions to return from stock selection within each individual sector. The sum of all nine individual stock selection returns equal the total stock selection return shown in Figure 2. The individual returns can be viewed by clicking on each bar in the graph.

FIGURE 5: FUNDAMENTAL DETAILS

ADVANTUS LG GROW
June 30, 1999 - September 30, 1999

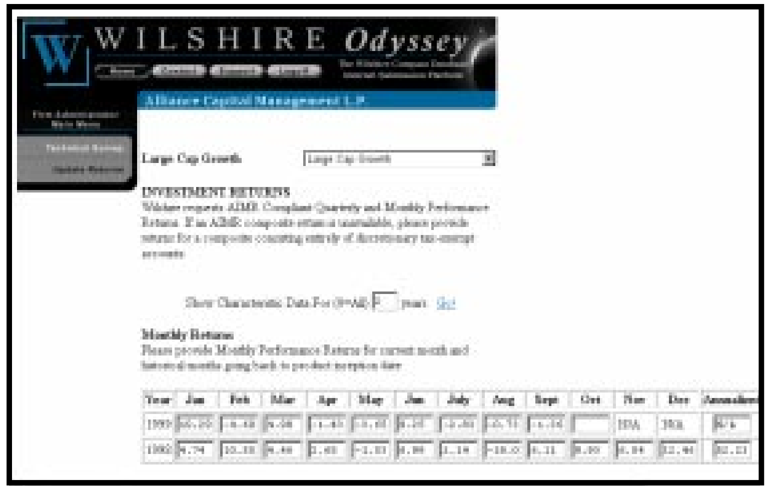
Wilshire 5000 Return	-6.61	**Style Component**	3.35
Wilshire Lg Grow Return	-3.26	**Market Timing**	0.10
Manager Total Return	-3.04	**Sector Selection**	-0.45
Manager Equity Return	-3.14	**Stock Selection**	0.50
		Trading	0.07
		Total vs. Benchmark	0.22
		Total vs. Market	3.57

Sectors	Index Sector Weight	Manager Sector Weight	Index Sector Return	Manager Sector Return	Return Due to Sector Selection	Stock Selection	Total
Capital Goods	6.20	6.37	5.34	2.94	0.01	-0.15	-0.14
Consumer Durable	0.53	1.52	-7.02	-11.51	-0.04	-0.07	-0.11
Consumer Non Durable	39.53	34.54	-9.31	-6.62	0.30	0.93	1.23
Energy	0.15	0.00	10.72	1.05	-0.02	0.00	-0.02
Finance	6.17	7.65	-18.62	-14.29	-0.23	0.33	0.10
Materials & Serv	3.59	13.04	-6.51	-6.88	-0.31	-0.05	-0.36
Technology	35.52	30.24	6.25	5.31	-0.50	-0.29	-0.79
Transportation	0.00	1.94	-0.01	-14.68	0.06	-0.28	-0.22
Utilities	8.31	3.44	-8.74	-6.65	0.27	0.07	0.34
Total	100.00	98.74	-3.26	-3.17	-0.45	0.50	0.05
T-BILL Return	1.10						
% Mgr Portfolio in Cash	2.46						

The analytic also provides a Default Report that details all of the attribution results used in the four graphs described above.

THE WILSHIRE ODYSSEY

We are pleased to announce that investment managers can now submit their composite returns via the Internet. We are expecting investment managers to also be able to submit representative portfolio holdings and questionnaire business data via the Internet by next quarter's update. By submitting data through our website: http://odyssey.wilshire.com, managers will be able to provide Wilshire with more timely updates. Although Wilshire currently has over 1750 investment products in the U.S. Equity database, over 750 products in the Non-U.S. Equity database, and over 1250 in the Fixed Income database, we believe that the number of investment products will increase dramatically once the web interface is fully completed.



BUILDING STANDARDIZED STYLE UNIVERSES (continued from page 2)

the graph indicate the managers'/indexes' return over the time period. The number in parentheses next to each return value is the percentile ranking over the time period. For example, Alliance's return of 42.83% for the one-year period ending September 30, 1999 ranked in the 16th percentile, while the Wilshire Large Growth Index's return of 35.10% ranked in the 44th percentile. The number of managers comprising the universe over each time period is included at the bottom of the graph.

The universe graph includes a report containing each managers'/indexes' return and ranking for every time period selected. To access the universe report, click on the *Report* menu at the top of the screen and select the *Default* option. Figure 4 (see page 2) displays a section of the underlying report for the universe graph shown in Figure 3.

Please refer to Figures 5 and 6 for examples of *Rolling Periods* and *Multiple Characteristics, Single Period* universe graphs

FIGURE 5: ROLLING PERIODS

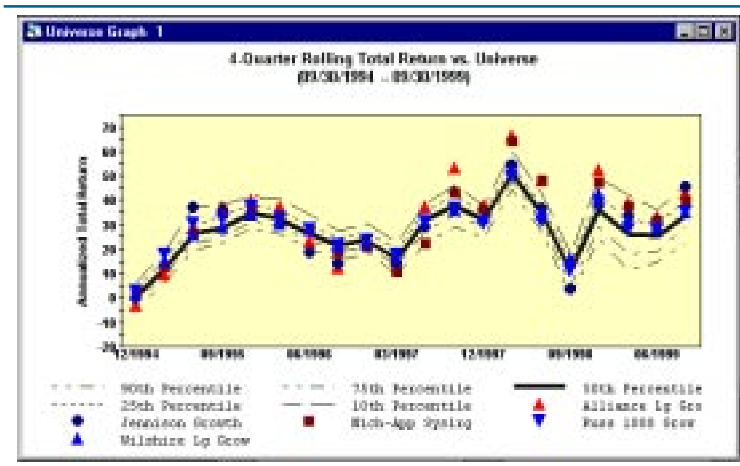


FIGURE 6: MULTIPLE CHARACTERISTICS