Rebalancing: A Good Idea

Mark Pankin
MDP Associates LLC
Registered Investment Advisor

June 28, 2003

www.pankin.com
mark@pankin.com
703-524-0937

Overview

- Review/update of prior talks
  - Dow Turnarounds
  - Market Timing
- Portfolio rebalancing
  - Benefits
  - Examples
  - Research Results
- NO RECOMMENDATIONS HERE

Not for everybody -- nothing is! Important to find out what is right and works for you.

Notes on the notes:

1) They were intended to provide reminders for the speaker and not designed to be a complete version of the talk. Between the notes and the slides, you should be able to get a pretty good idea about what was presented.

2) The slides should be readable in this version, but the charts may not be. You can download the slides only file, which should show up much larger on your screen or print at full page size. Download that file at my web site "www.pankin.com".

3) Talk was given June 28, 2003 at the main branch of the Arlington, Va. Public library as part of its weekly "Stock Talk" presentation.

Since individual circumstances are different, NOTHING SHOWN HERE SHOULD BE CONSIDERED AS ANY TYPE OF RECOMMENDATION!

Dow Turnarounds (January)

- Buy & sell stocks in the Dow
  - First buy on “fresh” 52-week low
  - Buy more lots on 8-12% drops
  - Sell when 45% above average purchase price
  - Sell if gets 25% above average and then falls by 20%
  - Sell may factor in taxes, market conditions, available buy candidates
- Some option strategies can be used

Gave talk on 1/4/03

Sell rule is simple, “average” version of the more complex rule I actually use. Also, deciding whether and when to sell can be complicated by what would be done with the sale proceeds. In strong markets when no new Dow stocks are buying candidate may want to hold and use some other method (e.g. chart reading) to decide when and at what level to sell.

Options strategies that are appropriate include selling puts instead of buying the stock and using a collar when the stock is near the selling target.

Stocks in Buying Range on 1/4/03

Stock	1/6/2003 Close	6/27/2003 Close	Percent Change	Sell Target
Home Depot	21.82	32.47	48.8%	35.00
McDonalds	16.65	22.37	34.4%	29.50
SBC*	31.19	25.44	-18.4%	43.00

*Note: SBC made fresh lows in March, shown on next slide. Sell target for newer purchase is lower

Since 1/6/03:	
Dow	2.5%
S&P 500	5.1%
Nasdaq	14.4%

These were shown in my talk. Six months is not enough time to judge the effectiveness of this method, but the results so far are interesting. I plan to update them at future talks.

Objective is outperforming the Dow. Average gain of the three is over 21% , so objective is being met so far.

New Buys in 2003

	Purchase information			Sale/recent price information			Dow since
Company	Date(s)	Avg. Price	# of Buys	Date	Price	Avg. %	1st buy
Boeing	2/20/03 - 3/6/03	27.32	2	6/27/2003	34.22	25.3%	13.6%
DuPont	3/5/2003	35.01	1	6/27/2003	41.83	19.5%	15.6%
General Motors	3/7/2003	30.79	1	6/27/2003	36.11	17.3%	16.1%
SBC Communications	3/10/2003	19.56	1	6/27/2003	25.44	30.1%	18.8%
AT&T	3/10/03 - 4/10/03	15.37	3	6/27/2003	19.37	26.0%	18.8%
Altria (Phillip Morris)	3/12/03 - 3/31/03	32.38	3	6/27/2003	45.10	39.3%	19.0%

Page is part of information on my web site, which has similar data for all potential buys starting in 2000.

Dow performance is good benchmark for stocks only bought once, but would need to use an average (not shown) for stocks with more than one lot bought.

So far (as of 6/2703), stocks have done better than the Dow over the same period.

Dow stocks in buying range

Stock	Ticker	6/27/03 Close	Buy Below	Sell Target
EASTMAN KODAK	EK	27.52	30.75	46.00
MICROSOFT CP	MSFT	25.63	30.85	44.00
Within 10% of buy level				
EXXON MOBIL	XOM	36.37	33.53	48.00
MCDONALDS CORP	MCD	22.37	20.66	29.50

Note: I have long stock or short put positions in Kodak and McDonalds

November - April Timing Model

- Be in market for those months
- 10/31/02 - 4/30/03: S&P 500 +3.5%
- Since 4/30/03: +6.5%

- Keep in mind that primary purpose of market timing is risk reduction.
- Timing will be important if we are in a long sideways channel like 1966-82.

Almost too simple to be considered a timing model

Somewhat unsatisfying since it does not take market movements into account. May be almost as hard as buy and hold to stick with.

Hard to see the logic behind it, but there may be some:

-- many bad Octobers

-- year end positive cash flows for several reasons

-- early year funding of prior year IRAs

-- selling to pay taxes in April?

-- most likely developed by noticing October crashes (1929, 1987), and examining historical monthly average performances

Triple 40 Timing Model (1)

- Weekly (Friday data) calculations:
  - 40 week moving average of S&P 500
  - 40 week MA of 90-day T-Bill rate
  - 40 week MA of 10-year T-Bond rate
- Model signals (comparisons to MAs):
  - Buy if S&P is above its MA <u>and</u> at least one T-rate is below its MA
  - Sell if S&P is below its MA <u>or</u> both T-rates are above their MAs

Logic: want to be in market when stocks are trending higher and interest rates are at least somewhat favorable (trending lower).

Note sell signal is logical inverse of buy signal

Triple 40 Timing Model (2)

- Sell signal on 4/5/02
- Buy 3/21/03, sell 3/28/03
  - S&P 500 -3.6% (Friday to Friday)
  - "whipsaws" are fairly unusual
  - S&P fell 20.2% during sell signal
- Buy signal on 4/17/03, still current
  - S&P +9.2% since then

Roughly one whipsaw every two or three years. Moving average models are subject to whipsaws, and the cures for that problem often are worse than the problem itself. In a simple model like this, it is better to live with the fairly rare whipsaws.

As of 6/26/03, model is not at all close to a sell since none of the inputs is close to its moving average. S&P MA is still below 900.

“RutVol” Timing Model

- Did not show during March talk
  - Too complicated
  - Tests out better
  - Limited “out-of-sample” experience
- Sell signal on 12/10/02, buy signal on 3/31/03 (still current)
  - S&P -6.2% during sell signal (-11.5% at low point)
  - S&P +15.1% since 3/31

Uses Russell 2000 (ticker RUT in some systems) movement and Volume of the Nasdaq Composite, which generates the name. Model was not developed by me.

Data as of 6/26 (UPDATE). Might give a sell signal within next two weeks if market weakens a bit.

I pay a lot of attention to this model, but it needs several more years (model developed in second half of 2001) of good real-time results to be considered as established.

Some Alternatives to Timing

- Buy and Hold
  - Works (in theory)
  - Very hard for most to do in reality
    - can't resist panic selling in a bear market
    - normally buy back in at higher prices if at all due to being scared of stocks
- Rebalance periodically
  - Increases returns and reduces risk
  - Requires discipline; can be hard to do
  - Can use with timing, other methods

Saying buy and hold works might be considered heresy from someone who is considered to be a timer.

Those who pay attention to the markets will find it almost impossible not to try to do something and resist selling when the S&P is in the process of losing almost half of its value as it has done in the current bear market (as of 10/9/02) and in 73-74. Retired broker once told me he would have made more money if he went to Tahiti for most of the year.

Dalbar studies show typical mutual fund investor behavior is like that described

Rebalancing is a much better approach. Can be hard because it calls for selling what has gone up and buying what has gone down to take advantage of natural ebb and flow of markets. That is OK for asset classes, but contrary to good advice for individual issues: cut losses and let profits run.

--> natural transition to main topic of this talk

Simple Rebalance Example

Stocks: Vanguard Index 500 Fund
Bonds: Vanguard Long-Term Corporate Bond Fund
Target Allocation: 65% Stocks, 35% Bonds
Rebalance Quarterly if Stocks are more than 5% over/under

	Returns		Reblance?			Number
	Stocks	Bonds	No	Yes	Difference	Trans.
1993	9.9%	14.5%	11.5%	11.5%	0.0%	0
1994	1.2%	-5.3%	-1.1%	-1.1%	0.0%	0
1995	37.5%	26.4%	33.6%	33.6%	0.0%	0
1996	22.9%	1.2%	15.8%	15.5%	-0.3%	1
1997	33.2%	13.8%	27.7%	26.6%	-1.0%	0
1998	28.6%	9.2%	23.7%	22.3%	-1.4%	1
1999	21.1%	-6.2%	15.0%	11.8%	-3.2%	0
2000	-9.1%	11.8%	-5.3%	-1.8%	3.5%	1
2001	-12.0%	9.6%	-7.4%	-3.9%	3.5%	1
2002	-22.2%	13.2%	-13.1%	-9.9%	3.2%	2
Annualized:	9.3%	8.4%	9.0%	9.6%	0.6%	

This slide was shown in the March talk

Bond fund returns are interest received plus price changes

First three rebalances were stocks to bonds (2000 was at start of year)
Last three have been bonds to stocks

Nothing magic about 65%/35% and 5% rebalance trigger; just a reasonable example for illustrative purposes

In practice, would have more asset classes, which I get to in a moment

Rebalancing

- Long-term approach, likely to underperform in strong bull markets
- Evaluate over representative periods (1993-2002 is good)
- Risk measures
  - Drawdown
  - Negative semi-deviation
  - Calculated on a monthly basis here

Underperformance in good markets can make this difficult to stick with. Also, likely to have losses (but smaller) in poor markets depending on mix of funds, which can also discourage sticking to method

Daily maximum drawdown (drop from peak to subsequent low) likely to be larger than monthly ones shown.

Standard deviation is most common risk measure, but volatility on the upside is not really risk. However, higher standard deviations almost always indicate greater risk.

Negative semi-deviation counts all months without losses as 0% and almost repeats the standard deviation calculation except for correcting for the mean.

(Square all the adjusted monthly changes, find the average including the 0 months, and take the square root.) Greater (absolute) values indicate higher risks. This eliminates the distortion caused by volatile upside performance.

Rebalancing: Example Portfolios

- Reasonable at start of 1993
  - Conservative/retirement
  - Moderately aggressive
  - Aggressive
  - Worldwide
- Typical target percentages
- Rebalance quarterly if any fund more than 2% away from target
- Different rebalancing period (yearly, semi-annual, monthly): little change

No optimization (which would in effect by cheating). Funds, targets, and 2% rebalance trigger chosen by judgment about what would have been sensible to do at the end of 1992.

Chose to show quarterly rebalancing as practical. Since difference between it and monthly, every six months, and once a year are small, can choose whatever fits preferences.

Moderately Aggressive Portfolio

Vanguard fund	Target	1993-2002 Annualized	Maximum Drawdown	Negative Deviation
Index 500	24%	9.3%	-44.8%	-13.2%
Small Cap Index	24%	8.0%	-34.0%	-11.6%
Precious Metals	7%	6.5%	-63.9%	-33.0%
International Growth	15%	6.1%	-46.8%	-15.4%
Long-term Corporate Bond	15%	8.1%	-8.8%	-3.7%
Short-term Corporate Bond	15%	6.2%	-2.2%	-0.4%
Unmanaged		7.7%	-25.5%	-2.3%
Rebalanced Quarterly		8.5%	-17.8%	-2.0%
difference		0.7%	7.7%	0.3%
percent improvement		10%	30%	11%

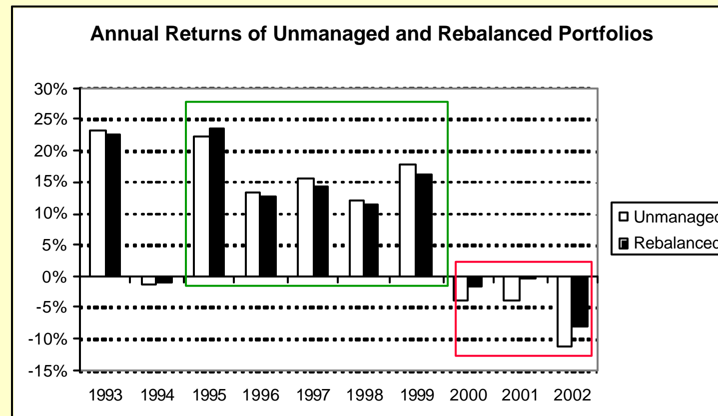
This portfolio would have been appropriate for someone still working and at least ten years from retirement. It could be suitable for other investors and might be considered typical of a balanced portfolio at the end of 1992.

Note wide variation in returns, risk measures of the component funds.

Vanguard (and Fidelity) funds shown, but that is for convenience. Many other funds could be used (and funds from more than one company if working through a mutual fund "supermarket"). While I work through Fidelity and its funds network, there is nothing special about Vanguard or Fidelity funds for the purposes of this presentation.

Rebalancing in this case improves the return and reduces the risk. Most of the changes are not dramatic, which is typical of rebalancing. It is NOT the "greatest thing since sliced bread!"

Moderately Aggressive Portfolio



Note that rebalancing generally underperforms in up years and does better in down years. Over longer periods that tends to improve returns and reduce risks.

Conservative/Retirement Portfolio

Fidelity fund	Target	1993-2002 Annualized	Maximum Drawdown	Negative Deviation
Equity Income	20%	10.0%	-29.7%	-7.1%
Growth & Income	20%	10.2%	-34.1%	-9.4%
Convertible Securities	10%	10.9%	-28.2%	-9.0%
Government Income	15%	7.0%	-7.3%	-2.4%
Mortgage Securities	15%	7.4%	-2.1%	-0.5%
Cash Reserves	20%	4.5%	0.0%	0.0%
Unmanaged		8.4%	-15.3%	-1.5%
Rebalanced Quarterly		8.6%	-9.3%	-1.1%
difference		0.2%	6.0%	0.4%
percent improvement		3%	39%	24%

Smaller stock holdings, more conservative funds than previous portfolio. Also 20% in money market

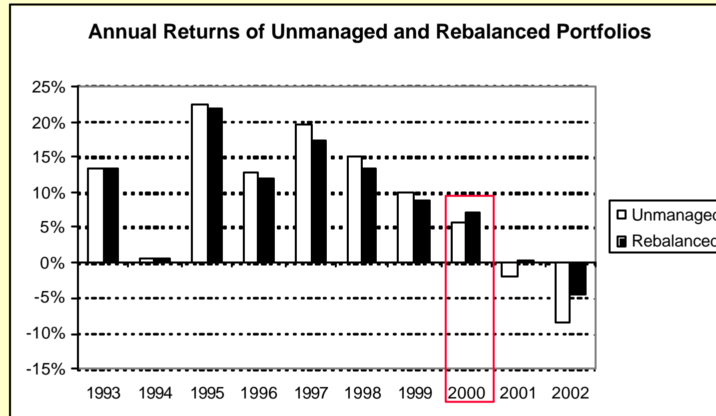
Improvement in return is very slight, but reduction of risk, which is lower than previous portfolio to start with, is substantial. Maximum drawdown of less than 10% is usually acceptable to almost all investors.

Risk reduction likely resulted from taking money out of stocks or bonds after they had risen and moving it to cash. However, that could also keep returns down in the continuing bull market.

If doing this type of portfolio today, would likely include TIPS (Treasury Inflation Protected Securities, which first were issued in 1997.

Will compare returns and risk levels for the four portfolios later.

Conservative/Retirement Portfolio



Similar pattern of comparisons to unmanaged.

Note that this portfolio was up in 2000, while the last one was down. That is due to smaller stock and greater bond holdings.

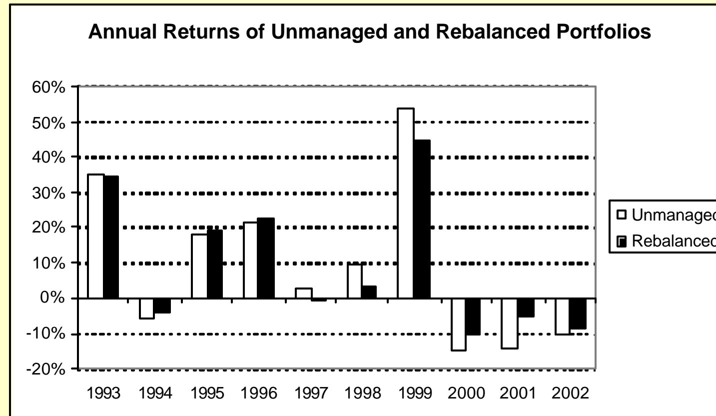
Aggressive Portfolio

Fidelity fund	Target	1993-2002 Annualized	Maximum Drawdown	Negative Deviation
Real Estate Investments	20%	10.0%	-23.8%	-8.6%
Emerging Markets	20%	-3.3%	-69.6%	-40.7%
Gold	10%	7.5%	-69.8%	-37.8%
Aggressive Growth	20%	4.0%	-84.0%	-32.2%
Low Priced Stock	15%	14.2%	-21.8%	-5.9%
OTC Portfolio	15%	7.4%	-66.4%	-25.8%
Unmanaged		7.4%	-45.5%	-3.8%
Rebalanced Quarterly		8.1%	-33.0%	-3.5%
difference		0.7%	12.4%	0.3%
percent improvement		10%	27%	8%

Now we go in a different direction. No bonds or money market. Different sectors (gold, real estate, emerging markets) make up half the portfolio.

Risk reductions are more modest because of no low risk asset class (i.e. no place to hide some times).

Aggressive Portfolio



Wide range of returns and same general pattern of comparisons

Worldwide Portfolio

Fidelity fund	Target	1993-2002 Annualized	Maximum Drawdown	Negative Deviation
Canada	15%	6.5%	-34.4%	-14.4%
Europe	20%	7.3%	-53.4%	-16.2%
Latin America*	15%	1.5%	-56.3%	-29.8%
Pacific Basin	15%	3.4%	-52.9%	-25.5%
SE Asia*	20%	1.9%	-60.6%	-28.0%
S&P 500 Index	15%	9.1%	-44.9%	-13.2%
* Fund started in 4/93; Emerging Markets used for Jan. - June, 1993				
Unmanaged		5.3%	-45.2%	-3.7%
Rebalanced Quarterly		6.3%	-43.9%	-3.8%
difference		1.0%	1.3%	0.0%
percent improvement		19%	3%	-1%

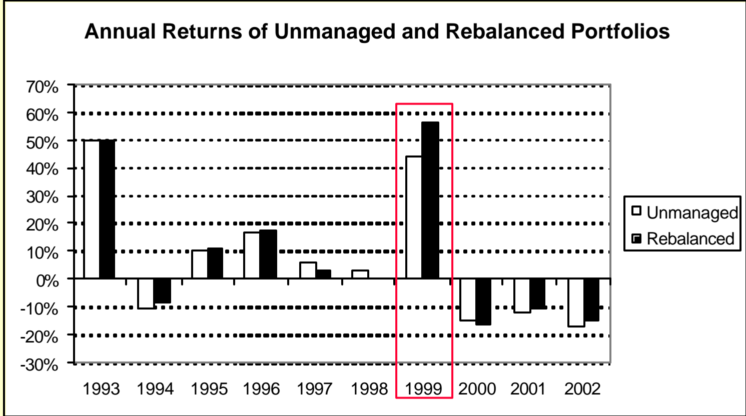
What about trying to cover the globe?

Since all holdings are relatively risky, rebalancing does not affect risk very much. Also, international markets have become more correlated over the past decade. Rebalancing should work better when asset classes as a whole are not highly correlated.

Since more international funds are available now, portfolio constructed today likely to be somewhat different from above. Problem for example was finding enough funds with long enough history. Had to improvise for first two quarters as it turned out.

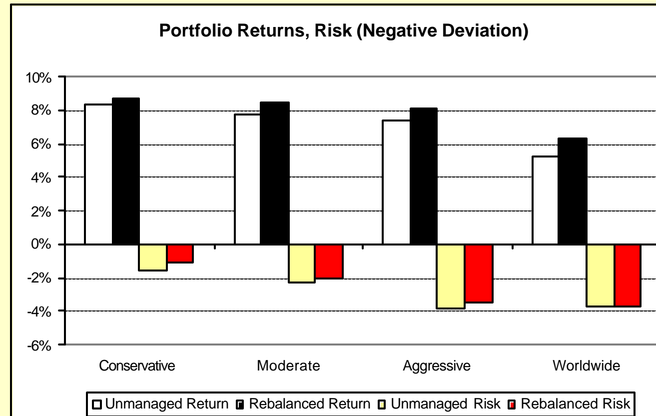
Several of Fidelity funds have a penalty if sold within 90 days of purchase. Quarterly (or longer) rebalancing works around that. Other funds may have longer penalty charge periods, which must be considered when formulating a rebalancing plan.

Worldwide Portfolio



Pattern of comparisons a bit different. Note that in 1999 rebalancing did much better than unmanaged, which was a big contributor to the overall performance increase.

Portfolio Comparison

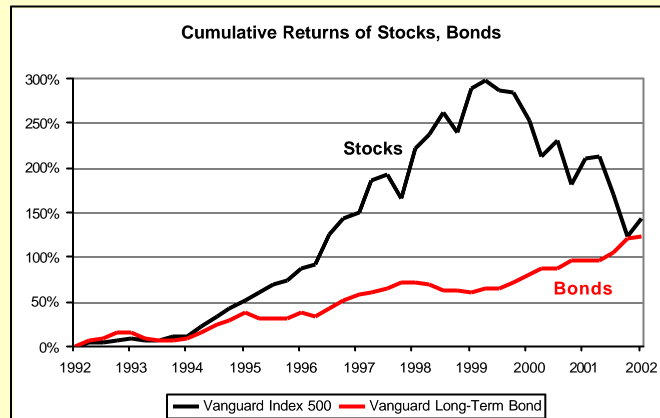


Note that returns from first three are close and better than Worldwide. I would not assume this will be true in the future, but would not be surprised if it is.

Risk levels (negative semi-deviations) follow the expected pattern.

This shows rebalancing is not an investment panacea, but is a useful technique.

1993-2002 Market Trends



Does the long (unprecedented) bull market followed by the sharp bear market and strong bond markets affect the rebalancing results?

93-02 Trends Affect Rebalancing?

- Do rebalancing results depend on trends of past ten years?
  - Stocks: way up 95-99, down 00-02
  - Bonds: steady & strongly up 01-02
- Randomly rearrange the 40 quarters
- Calculate rebalancing return using new sequence for Moderately Aggressive (unmanaged is same)
- Repeat many (100) times

This is a type of “bootstrapping” in statistical analysis terms.

Chose to focus on Moderately Aggressive because it showed the greatest combined return and risk reduction effects. However, the study focused on returns since that seems to be of greater interest.

Would have run more than 100 cases, but the answer seemed pretty clear at that point.

Order of quarters not critical

- Moderately Aggressive
  - Unmanaged return: 7.71%
  - Rebalanced: 8.46%, 16 rebalancings (actual sequence)
- Rebalancing using 100 random sequences of 40 quarters:
  - Average return: 8.47%, 8.24 - 8.75%
  - Average rebalances: 13, 9-16
- Real sequence return right in middle, number of rebalances is high (5/100)

Modest spread of returns, but even lowest is still well above the unmanaged return.

Number of rebalances of actual sequence is at the high end (5% of the random sequences) most likely caused by the strong trends, both up and down, in stocks over the last 8 years.

This indicates that rebalancing results shown are not a “fluke” caused by the particular market action since 1995.

Rebalancing Works

- Takes advantage of natural ebb and flow of different asset class returns
  - Less correlated is better
  - Unlike individual holdings when better to sell losers and keep winners
- Forces selling higher, buying lower
  - Far from optimal timing
  - May not be the case if all classes move in same direction
- Effects are modest, easy to obtain

Make distinction between asset classes and individual stocks or other holdings for which "cut your losses and let your profits run" is generally good advice. With asset classes, "trees don't grow to the sky" is a better aphorism.

If all classes move similarly, may be "rearranging the deck chairs" more than selling higher and buying lower

Since it is relatively easy, rebalancing is a good idea for virtually all portfolios. I have been practicing it personally for years.

Using Rebalancing

- Formulate overall portfolio
  - Current total financial position
    - include anticipated working income
    - pension plans/retirement accounts
  - Goals, uses of money, when needed
  - Can go well beyond mutual funds
  - Adapt to your capabilities, tolerances
  - Consider taxes, transaction costs
- Plan to rebalance 2 - 4 times a year
  - Precise dates & amounts not critical
  - STICK TO IT!

Financial planning is the most important thing. Hope everyone has done it already. If not, do it before worrying about things presented here.

Had hoped to illustrate effects of taxes, but that quite quickly became too complicated (no surprise) to consider doing here.

Resist temptation to use personal judgment about what the markets are likely to do in next period to override rebalanacing moves.

Mark Pankin

- RIA since October 1994
- Managed account expertise/services
  - Market timing
  - Dow Jones Industrial stocks
  - Sector fund trading (Fidelity, Rydex)
  - Portfolio design, rebalancing
- Much more at www.pankin.com
  - Click on Investments, then Managed Accounts, follow links
  - Info about Mark and his interests