Dynamic Asset Rotation
A Tool to Evaluate Allocation Strategies

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AAII/DynAssetRotation.pptx

Overview

- **Software computes the optimum allocations for a diversified portfolio and the portfolio value.**

- **Step 1:** Select a portfolio of uncorrelated assets

- **Step 2:** For each asset in the portfolio

  compute a selectable dynamic allocation parameter

- **Step 3:** Compute the dynamic weighting for each asset

- **Software is primitive, not well supported.**

Asset Rotation Software

- **Excel Spreadsheet, with Tabs for**

Control Worksheet

Documentation, Control Panel allows user to vary parameters

Worksheets for each Asset Class

Computes return parameters for a maximum of 14 assets

Portfolio Worksheet

Computes the portfolio value based on the chosen   parameters

Allocation Worksheet

Weight computations for dynamic asset allocations.

Step 1

- **Select a portfolio of N uncorrelated assets**

Example:	Fixed income	VFISX, VBIIX, VBLTX
	Domestic stocks	VIVAX, VIGRX
		VIMSX
		VISVX, VISGX
		PRNEX, VGSIX
	International stocks	VTRIX, VWIGX, VEIEX

- **Download adjusted price data:**

  Monthly or weekly time series; Only input required.

Step 2

- **For each of N assets in the portfolio**

  Compute a dynamic allocation parameter, P_n

  For example … Price Oscillator

or	**FundX Rate**
or	**Linear Regression Rate**
or	**Transition Rate**
or	**Sharpe Ratio**
or	**Build-It-Yourself**

Step 3

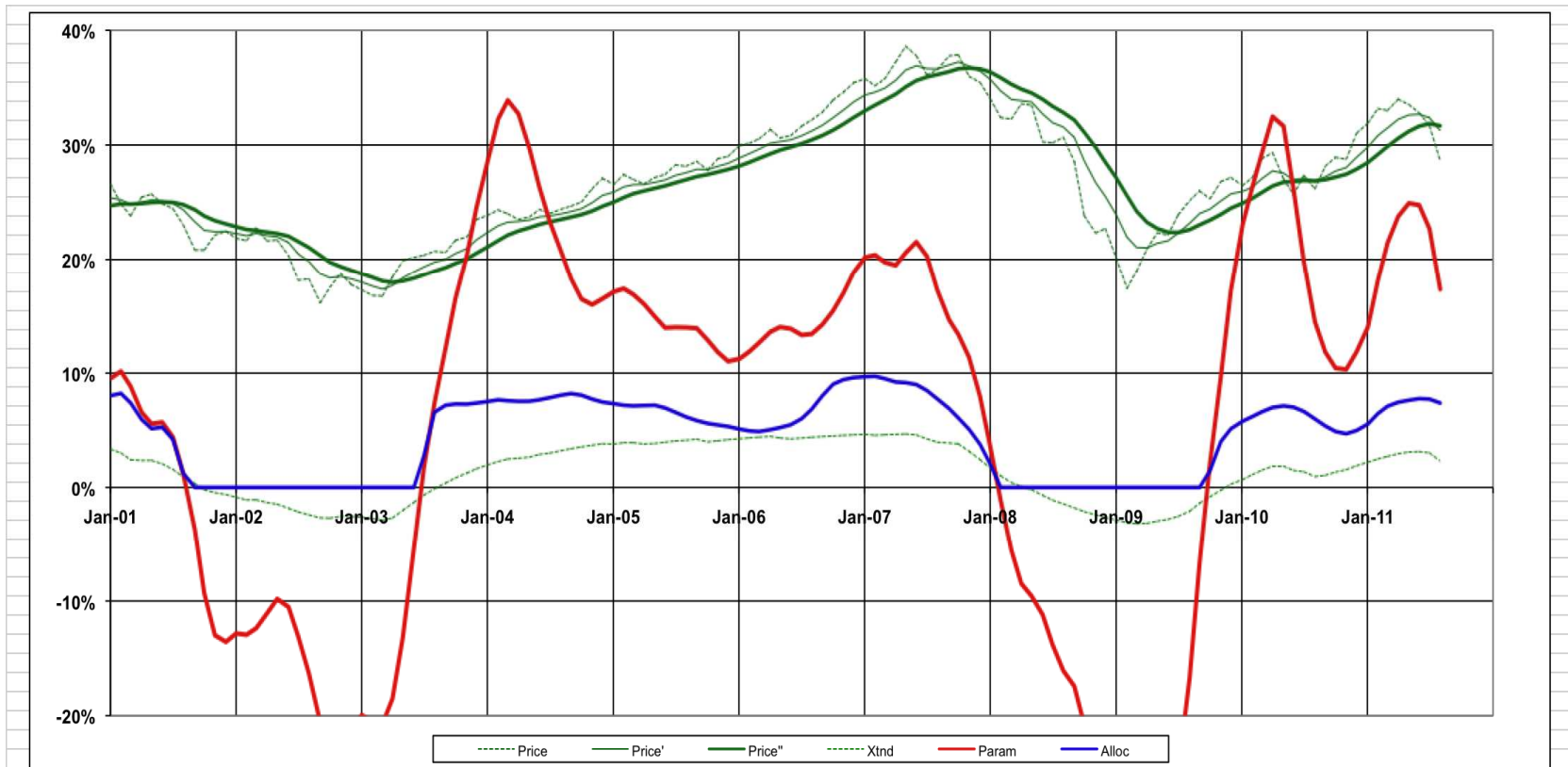- **Compute the weight for each asset proportional to its allocation parameter, P_n**

  For Asset (n)

  $$\text{Weight}_{(n)} = P_n / (P_1 + P_2 + \ldots + P_n \ldots + P_N)$$

- **Compute value of Portfolio using these weights.**

Sample Graph using FundX Model

Vanguard Large Cap Value Index

VIVAX   Vanguard Large Cap Value Index

AsRot/PrimaryModel.xlsx   10/29/11

Control Panel

Portfolio Asset Allocation Models

(a) Static Model	St			
	0			

(b) Price Model	Price	Price exponential smoothing		
	0		Name	Exp.
		Price'	P.1	0.7
		Price"	P.2	0.7

(c) Rate Model	Rate	Fund X score weighting		
	1	FundX	Weight	Duration
		w.1	0	0
		w.3	1	3
		w.6	1	6
		w.9	1	9
		w.12	1	12
		wt	4	7.5
		dur	7.5	

		Rate exponential smoothing	
		FX score	R.1	0.7

(d) Regression Model	Reg	Mean Regression	
	0	Proj Years	Yrs	5

(e) Auto Transition Model	Auto	0.8	
	0	Auto	ATs	0.7

Sharpe Ratio	SR	Asst.1	0	
	0		Rrf	0.5%

Build-It-Yourself	BIY	BIY exponential smoothing		
	0	BIY	BIYs	0.7

Total Return		0.9		
		10 year	TRs	0.90

Shorts and Margin	S.M			
	0			

Built-In Allocation Models

- **Static Model:** Uses traditional fixed allocations

- **Price Model:** Uses delta between two exp smoothed averages

- **Rate Model:** Uses combination of 1m, 3m, 6m, 9m, 12m returns

- **Regression Model:** Projects future rate from best fit straight line

- **Transition Model:** Uses built-in Transition Detector

- **Sharpe Model:** Uses the Sharpe Ratio for any of the models

- **BIY Model:** Design your own allocation parameter

Static Model

- **Traditional asset allocation**
- **Rebalances monthly to a fixed allocation**

    e.g.   **10% in each fixed income fund (Total =30%)**

    plus 7% in each equity fund (Total = 70%)

    or   **20% in each fixed income fund (Total =60%)**

    plus 4% in each equity fund (Total = 40%)

- **Set static allocations on the Control worksheet**
- **Good reference; surprisingly difficult to beat !**

Price Model

- **Select appropriate parameters for smoothed price**

    e.g. equivalent to 50-day and 200-day moving averages

- **Compute a Price Oscillator**

    = (50-day MA − 200-day MA) / 200-day MA

- **Use this Price Oscillator as the allocation parameter, P**
    to determine asset weights

- **Goes to zero at the Death Cross (c.f. Faber's QTAA model).**

Rate Model

- Select the combination of rates to use

  from 1m, 3m, 6m, 9m and 12m returns

- Calculate the average return (c.f. FundX score)

- Calculate the average "duration" for this return

- Compute the annualized value of the return

- Use this value as the allocation parameter P.

Regression Model

- **Compute the slope and intercept for the best fit line for the past 10 years of price data**

- **Extrapolate the line to project the price at a future time n years from now**

- **Compute the annualized return needed to achieve this future price from the current price.**

- **Use this value as the allocation parameter P.**

Transition Model

- **Uses a built-in transition detector to automatically switch between the rate and regression models**

- **Determine the maximum price, P_{max}, and the minimum price, P_{min}, for the past 12 months**

- **The transition detector output is given by**

$$Xtd = (P_{cur} - P_{min}) / P_{max} - P_{min})$$

- **The allocation parameter is given by**

$$P = Xtd * Rate\ value + (1 - Xtd) * Regression\ value.$$

Sharpe Model

- **Computes the Sharpe Ratio for any of the models**

    Price, Rate, Regression, Transition

- **The risk-free return**

    can be entered manually on the Control Panel,

    or dynamically extracted from the Asset 1 worksheet

- **Use the Sharpe Ratio as the allocation parameter.**

Build-It-Yourself (BIY) Model

- The software has hooks to design your own allocation model

For example

$$P = \text{Greater of } \{R_1 \text{ or } R_{10}/(1 + R_1)\}$$

where R_1 and R_{10} are the 1-year and 10-year returns.

Conclusion

- **Currently loaded with Vanguard index funds**

  Ten years of monthly data to October 31, 2011

- **Useful to (a) evaluate allocation strategies**

  or (b) ongoing portfolio management

- **Spreadsheet: www.siliconvalleyaaii.org**

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