

A 3 Factor Portfolio Weighting  
Model for Select Stocks in The  
Healthcare Sector: An Empirical Analysis  
2009-2019

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# Study Overview

## **Study Purpose:**

- Determine if Revenue Growth , Relative Profits, and Relative Price Momentum are Priced-in Risk Factors in the Equity Market

## **Investment Strategy:**

- Develop Constant Share and Adjustable Share Models

## **Factor Weighting Strategies:**

- Revenue/Share (RPS) and Relative Price Momentum (RPM)
- Operating Profits (OP) and Relative Price Momentum (RPM)

## **Factor Weighting**

- Original Weights Based on Univariate Regressions
  - $RPS = f(\text{Time})$
  - $OP = f(\text{Time})$
  - $RPM = P(t+1)/P_t$
  - Factor Weighting Allocation

# Factor 1 Algorithm

## Healthcare

### Constant Share Model

#### 1st Iteration

Step 1  $RS_i = A_i + B_i(t)$   $\ln RS_i = A_i + B_i(t)$

Step 2  $W_i(t) = B_i / \text{Sum } B_i$

Step 3  $D_i(t) = W_i(t) * 1,000,000$

Step 4  $SHRS_i(t) = D_i(t) / P_i(t)$

Step 5  $MV_i(t+1) = SHRS_i(t) * P_i(t+1)$

Step 6  $PV(t+1) = \text{Sum } MV_i(t+1)$

#### 2nd Iteration

Step 7  $MV_i(t+2) = SHRS_i(t) * P_i(t+2)$

Step 8  $PV(t+2) = \text{Sum } MV_i(t+2)$

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Total Iterations: 11

Nomenclature:

$\ln$  = Natural Log

$RS$  = Revenue Per Share

$i$  =  $i$ th Sector (5 sectors)

$t$  = time in years (2009-2019)

$A, B$  = Equation Parameters

$W_i$  = Stock Weight

1,000,000 = Original Investment

$B_i$  = Slope coefficient

$D_i$  = Dollar Investment

$SHRS$  = Shares held in Stock( $i$ )

$P_i$  = Price Index for Stock( $i$ )

$MV_i$  = Market Value, Stock( $i$ )

$PV$  = 10 Stock Portfolio Value

**Factor 2 Algorithm  
Healthcare  
Adjusted Share Model**

1st Iteration

- Step 1  $RPI_i(t+1) = P_i(t+1) / P_i(t)$   
Step 2  $RPW_i(t+1) = RPI_i(t+1) / (\text{SUM } RPI_i(t+1) / N)$   
Step 3  $ASHRS_i(t+1) = RPW_i(t+1) * SHRS_i(t)$   
Step 4  $MV_i(t+2) = SHRS_i(t+1) * P_i(t+2)$   
Step 5  $PV(t+2) = \text{Sum } MV_i(t+2)$
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Total Iterations: 10

Added Nomenclature:

RPI = Relative Price Momentum Index

RPW = Relative Price Momentum Weight

N = Number of Stocks in Portfolio (N=10)

ASHRS = Adjusted Shares

# Revenue/Share Returns vs SPY & XLV

## Constant Share Model (CSM)

Revenue/Share

	Model	Cumulative	SPY	XLV	Alpha vs SPY	Alpha vs XLV
CSM	R/S	793.1%	246.2%	276.0%	546.8%	517.1%
CSM	R/S Logs	560.2%	246.2%	276.0%	314.0%	284.2%

## Adjusted Share Model (ASM)

	Model	Cumulative	SPY	XLV	Alpha vs SPY	Alpha vs XLV
ASM	R/S	7138.4%	246.2%	276.0%	6892.1%	6862.4%
ASM	R/S Logs	4169.6%	246.2%	276.0%	3923.4%	3893.6%

# Operating Profit/Share Returns vs SPY & XLV

## Constant Share Model (CSM)

### Operating Profit/Share

	Model	Cumulative	SPY	XLV	Alpha vs SPY	Alpha vs XLV
CSM	OP/S	475.9%	246.2%	276.0%	229.6%	199.9%
CSM	OP/S Logs	426.8%	246.2%	276.0%	180.5%	150.8%

## Adjusted Share Model (ASM)

	Model	Cumulative	SPY	XLV	Alpha vs SPY	Alpha vs XLV
ASM	OP/S	2129.0%	246.2%	276.0%	1882.8%	1853.0%
ASM	OP/S Logs	2673.8%	246.2%	276.0%	2427.6%	2397.8%

# Cumulative Return Comparison

	Model	Cumulative	Ranking
R/S	ASM	7138.4%	1
R/S Logs	ASM	4169.6%	2
OP/S Logs	ASM	2673.8%	3
OP/S	ASM	2129.0%	4
R/S	CSM	793.1%	5
R/S Logs	CSM	560.2%	6
OP/S	CSM	475.9%	7
OP/S Logs	CSM	426.8%	8