

**Portfolio Stochastic Design Scans:  
Scans in a Black Swan Market**

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**“ In the end, how your investments behave is much less  
important than how you behave. ”**

**Benjamin Graham  
The Intelligent Investor**

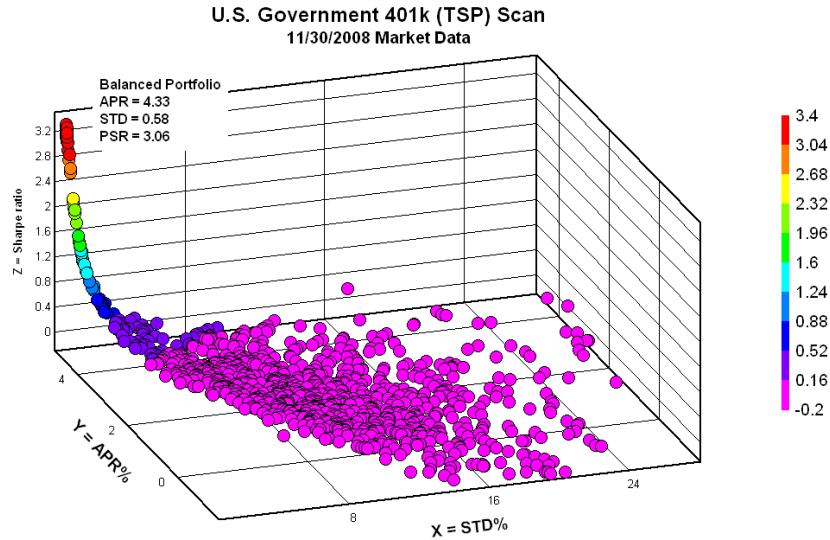
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## **Stable Value Investments**

**A Stable Value Organization was established in 1990 to support the use of stable value investments in retirement funds. These are important investment options available in about two-thirds of all defined contribution retirement plans. We used one from ABN ARMRO in the MSC 401k Profit-Sharing-Plan for years. The reason for the note is a “inversion problem” they create when imaging a Black Swan market scan in 3D. To understand the reason for the “problem” recall the definition of Sharpe Ratio, cf. section 4.19 on Sharpe ratios in William F. Sharpe’s 2007 book “Investors and Markets”. The risk-free return has zero standard deviation by definition. It is not a point on the efficient frontier formed by all possible portfolios using the funds in a 401k plan. When all the other investment options in the plan have lower returns than the risk-free return we have a Black Swan situation that the Sharpe ratio definition never imagined, an inverted Capital Market Line. The Sharpe ratio scan points to the obvious, just put all the money in the risk-free stable value fund. I first noticed this in a scan for the U.S. Government 401k (TSP) using 11/30/2008 market data. This TechNote is about the utility of design scan images in a Black Swan market with a stable value fund in the scan.**

### **What Exactly is the Inversion Problem?**

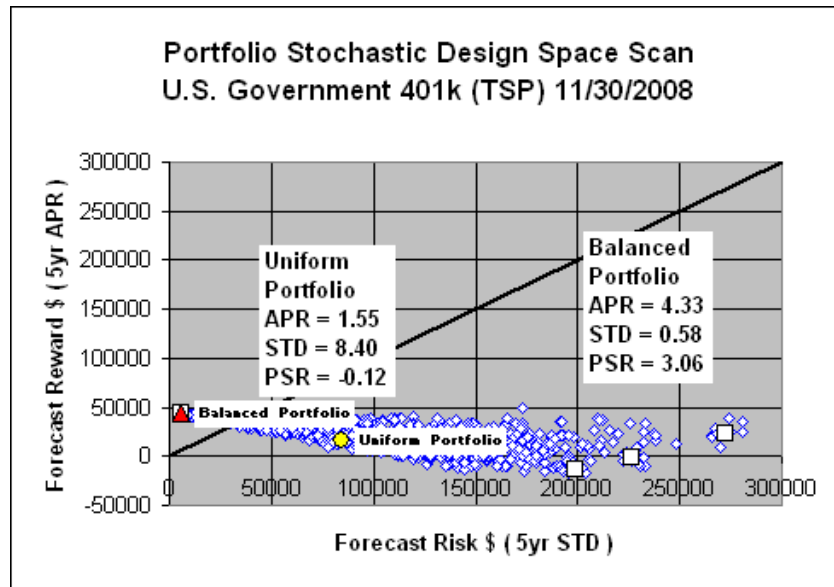
**When you look at the 11/30/2008 PSDS Scan of the U.S. Government 401k (TSP) on [psdscanner.blogspot.com](http://psdscanner.blogspot.com) you see the 3D image shown here which illustrates what I am talking about.**



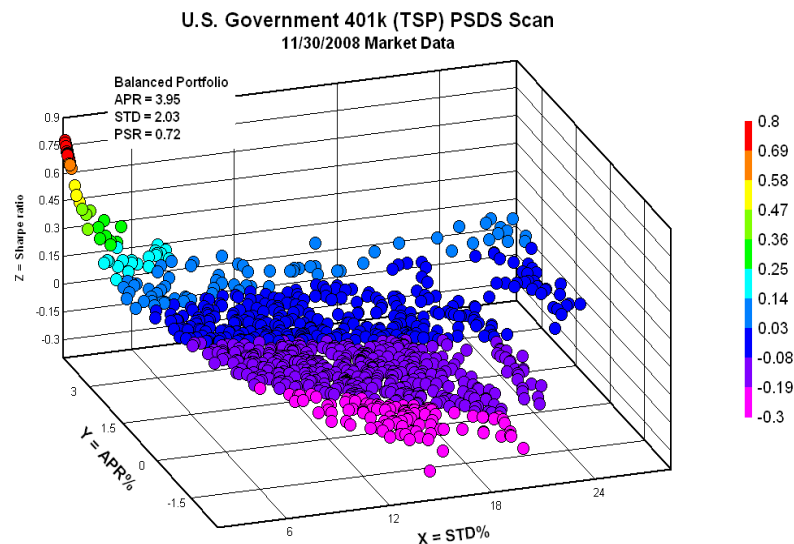
In the above image the stable value fund (Fund G) is in effect a risk-free return available in the portfolio with the other Funds F, C, S, and I all having lower 5yr returns than Fund G. The Balanced Portfolio has an artificially high Sharpe ratio because the U.S. Treasury makes Fund G's standard deviation artificially low. In general stable value investments use insurance wrappers, synthetic GICs or other types of insurance contracts. A GIC is a group annuity contract issued by a life insurance company to a tax-qualified pension plan as an investment. There are many varieties but all provide for the guarantee of principal and interest. Can they really do that in Black Swan market year?

The Capital Market Line in two dimensions ( $x=STD$ ,  $y=APR$ ) is the line that connects the risk-free point to the Sharpe Ratio point. This normally allows an investor to select any portfolio on that line and know that it has the highest return for a given risk (standard deviation) between zero and the standard deviation for the Sharpe ratio point. This assumes the Sharpe ratio point return is higher than the risk-free return. Clearly that is not the

case here and the **Balanced Portfolio** has correctly invested virtually the whole portfolio in Fund G. We did not need a scan to know that but it reassuring to see that the **PSDS Balanced Portfolio** and the common sense portfolio are the same.

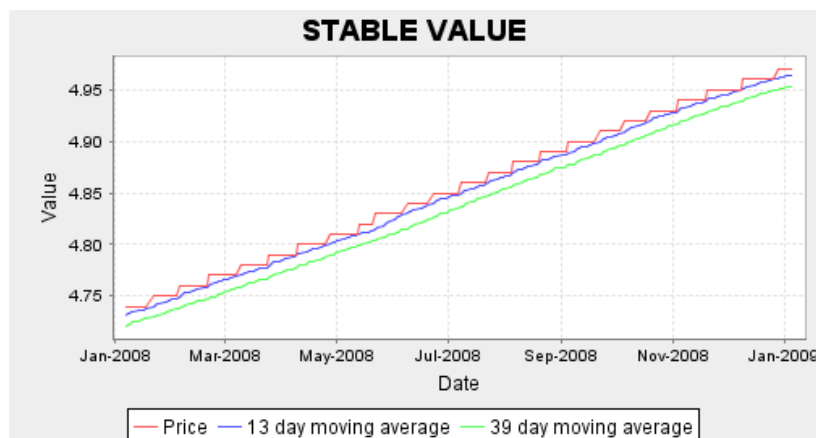
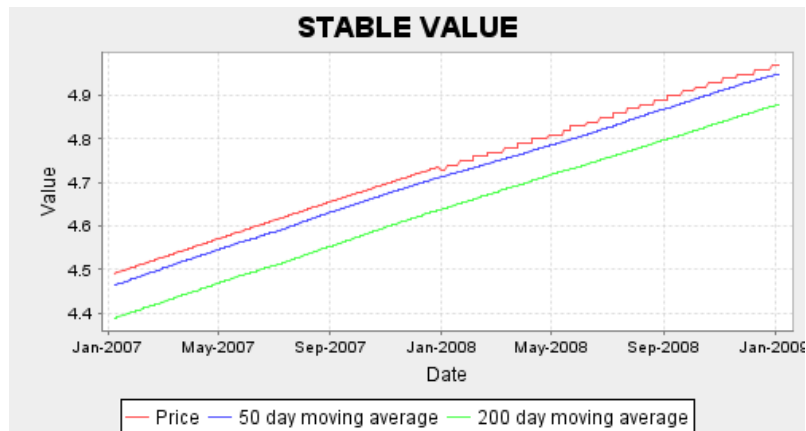


If you do not include Fund G in the scan the only fund left with a positive 5yr Sharpe ratio is Fund F. That 3D image still has a peak but it has a much smaller Sharpe ratio more reflective of free market risk.



## Stable Value Investments in 2008

AIG and a few other insurance companies virtually collapsed in Q4 2008 due to a “Black Swan” market year, GIC guarantees may be a bit less certain than many of us thought. One concern is that some stable value investments might be having a Black Swan year. The data provided to plan participants should be checked carefully before making any big changes. The IBM 401k plan is one of the largest and best documented plans that I have found to date. There are over 200 funds in the plan including a stable value fund, SVALU. The two charts provided for SVALU are updated daily and are shown here. As of January 2009 they remain perfectly stable,



as guaranteed by an insurance product I assume. Most other plans update their data quarterly. Wells Fargo's 401k plan has a stable investment option and they provide stable value investments to several of their client's 401k plans. A table from the Wells Fargo 401k plan website is shown below which shows annual stable value fund returns with small changes year to year to 2007. This is typical of the data I have seen for the 401k plans I have scanned. The Northrop Grumman's 401k (FSSP) also has a stable value fund and they reported a 3yr standard deviation of 0.07 on 12/31/2006 which was extraordinary even for a stable value fund.

Annual Rate of Return					
The following return information does not comply with SEC standards for fund prospectuses. Unless otherwise indicated, returns reflect changes in unit value and do not include the reinvestment of dividends and capital gains. Past performance is no guarantee of future results.					
Investment funds	2003	2004	2005	2006	2007
Stable Value Fund	5.43%	4.75%	4.69%	4.92%	5.00%
Bond Index Fund	4.67%	4.20%	2.37%	3.90%	7.30%
Conservative Allocation Fund	9.31%	4.24%	3.08%	6.58%	5.95%
Moderate Balanced Fund	15.66%	5.99%	3.83%	9.28%	6.28%
Growth Balanced Fund	23.54%	8.07%	4.79%	12.43%	6.56%
Aggressive Allocation Fund	27.05%	9.21%	5.27%	14.02%	6.46%
Asset Allocation Fund	24.79%	10.44%	5.88%	13.25%	8.65%
Dodge & Cox Fund	32.35%	19.16%	9.36%	18.54%	0.14%
S&P 500 Index Fund	28.63%	10.86%	4.96%	15.88%	5.56%
Diversified Equity Fund	29.43%	10.76%	6.52%	14.21%	5.87%
Capital Growth Fund	25.79%	18.06%	10.00%	4.90%	18.54%
Large Company Growth Fund	26.77%	3.26%	5.73%	2.23%	7.33%
S&P MidCap Index Fund <sup>1</sup>	35.65%	16.67%	12.62%	10.54%	8.09%
Diversified Small Cap Fund	43.93%	19.11%	6.74%	13.20%	-0.79%
EuroPacific Growth Fund	33.25%	19.98%	21.38%	22.17%	19.22%
Nasdaq-100 Index Fund	48.88%	10.40%	1.70%	7.14%	18.96%
Wells Fargo Stock Fund					
Without Dividend Reinvestment	25.65%	5.54%	1.09%	13.19%	-15.10%
With Dividend Reinvestment	29.41%	8.89%	4.47%	16.85%	-12.21%

I would look to the Stable Value Organization for guidance on matters concerning Black Swan risks. In the past I have used stable value investments during down market events like the .com bubble of a few years back with good success. As with mutual funds there are stable value funds that are better than others, be careful.