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# Pension problem: Pension Inflation $\neq$ CPI

Many pensions have an allocation to some type of inflation hedge strategy. The most common asset strategies are TIPS and real assets. These strategies are based on hedging or outperforming the CPI. The truth is... these are not appropriate strategies for hedging pension inflation. Pension inflation is what a plan sponsor agrees to as a cost of living adjustment (COLAs) benefit increase for retired lives and a salary increase factor for active lives. Quite often, these COLAS are based on the CPI with a floor and a cap or even a % of the CPI while salary increases tend to be quite static @ a 3% annual increase. As a result, pension inflation tends to be less volatile than the CPI. The plan sponsor actuary includes pension inflation (COLAs and salary increases) in their projected benefit payment schedule for both retired and active lives. In sharp contrast, the CPI is a volatile measurement of consumer inflation with only three years (1966, 1992, 1993) showing inflation at 3% since 1913 as the graph and table below depict.

*William F. Sharpe*  
Lifetime Achievement Award

*Money Management Letter*  
Lifetime Achievement Award

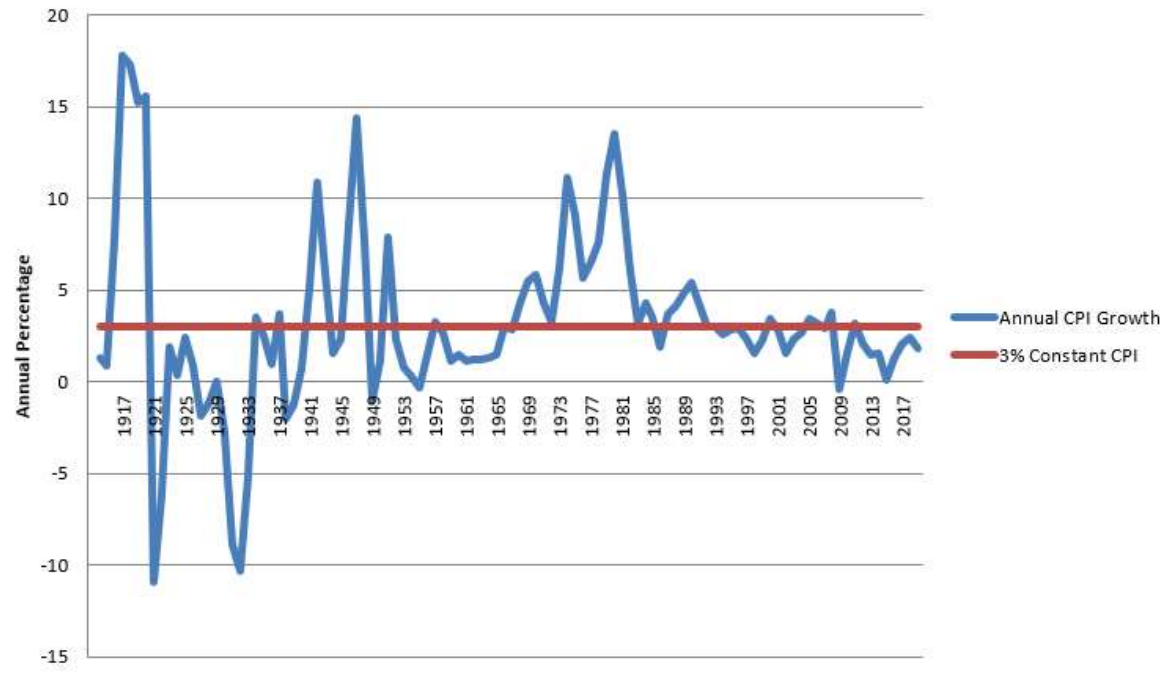
*Capital Link*  
Most Innovative ETF Award

*IMN*  
ETF of the Year Award

*Bernstein Fabozzi/Jacobs Levy*  
Research Paper of the Year Award



### Annual CPI Growth versus 3% Constant CPI



## History of Annual CPI Growth Rates

Year	CPI %	Year	CPI %	Year	CPI %	Year	CPI %	Year	CPI %	Year	CPI %
		1930	-2.7%	1950	1.1%	1970	5.8%	1990	5.4%	2010	1.6%
		1931	-8.9%	1951	7.9%	1971	4.3%	1991	4.2%	2011	3.2%
		1932	-10.3%	1952	2.3%	1972	3.3%	1992	3.0%	2012	2.1%
		1933	-5.2%	1953	0.8%	1973	6.2%	1993	3.0%	2013	1.5%
1914	1.3%	1934	3.5%	1954	0.3%	1974	11.1%	1994	2.6%	2014	1.6%
1915	0.9%	1935	2.5%	1955	-0.3%	1975	9.1%	1995	2.8%	2015	0.1%
1916	7.7%	1936	1.0%	1956	1.5%	1976	5.7%	1996	2.9%	2016	1.3%
1917	17.8%	1937	3.7%	1957	3.3%	1977	6.5%	1997	2.3%	2017	2.1%
1918	17.3%	1938	-2.0%	1958	2.7%	1978	7.6%	1998	1.6%	2018	2.4%
1919	15.2%	1939	-1.3%	1959	1.1%	1979	11.3%	1999	2.2%	2019	1.8%
1920	15.6%	1940	0.7%	1960	1.5%	1980	13.5%	2000	3.4%		
1921	-10.9	1941	5.1%	1961	1.1%	1981	10.3%	2001	2.8%		
1922	-6.2%	1942	10.9%	1962	1.2%	1982	6.1%	2002	1.6%		
1923	1.9%	1943	6.0%	1963	1.2%	1983	3.2%	2003	2.3%		
1924	0.4%	1944	1.6%	1964	1.3%	1984	4.3%	2004	2.7%		
1925	2.4%	1945	2.3%	1965	1.5%	1985	3.5%	2005	3.4%		
1926	0.9%	1946	8.5%	1966	3.0%	1986	1.9%	2006	3.2%		
1927	-1.9%	1947	14.4%	1967	2.8%	1987	3.7%	2007	2.9%		
1928	-1.2%	1948	7.7%	1968	4.3%	1988	4.1%	2008	3.8%		
1929	0.0%	1949	-1.0%	1969	5.5%	1989	4.8%	2009	-0.4%		

Source<sup>77</sup> Federal Reserve Bank of Minneapolis

The history of CPI growth rates itemized in the table above show the following characteristics:

1. 13 years which CPI growth was *negative*  
(1921, 1922, 1927, 1928, 1930-33, 1938-39, 1949, 1955, 2009)
2. 10 years of positive *double-digit* CPI growth  
(1917-20, 1942, 1947, 1974, 1979-81)
3. 25 years of positive CPI growth above 5.0%  
(1916-20, 1941-43, 1946-48, 1951, 1969-70, 1973-82, 1990)
4. No CPI growth above 3.0% since 2011

## **TIPS**

Treasury Inflation-Protected Security (TIPS) are low yielding Treasury securities where the principal is linked or based on the CPI with a coupon added as the inflation value added or real yield. Currently, TIPS are trading at a YTM of @ -0.164% (5-year), @ -0.076% (10-year) and @ 0.22% (20-year). In the last ten years the principal growth of TIPS has been well below 3.0% (since CPI average = 2.1% since 2000) while TIPS *real yields* have been quite low providing little value added. In the last 5 years (ending 1/31/20), the S&P U.S. TIPS 1-10 year Index (SPBDUSPT) had an annualized total return of 2.61%... this is before trading costs and any asset management fees.

## **Real Assets**

Real assets cover a wide range of investable assets. The S&P Real Assets Index (SPRAUT) includes stocks of global property, infrastructure, natural resources, timber and forest companies as well as inflation linked bonds and commodities. The total return history for this index reveals an annualized return of 3.81% over the last 5 years. Once again this is before trading costs and asset management fees which could be high. The biggest issues here may be liquidity and cash flows. Any pension inflation hedge needs to be able to fund *monthly* liability cash flows chronologically from today until as far out as possible. Such required asset cash flows would be difficult with real assets who generate little and uncertain cash flows. As such they would *not qualify as assets for cash flow matching liability cash flows*.

## **Solution: Cash Flow Matching Liabilities**

**Securing benefits of Retired Lives by matching and funding the projected liability benefit payment schedule (liability cash flows) at the lowest cost is the highest priority of any pension.** This is also the ideal way to de-risk a pension plan and hedge pension inflation. Since the actuary includes pension inflation in their liability projections, by cash flow matching the projected liability cash flows (benefit payments) you have hedged pension inflation accurately. There is no other asset strategy that can hedge actuarial pension inflation exactly except insurance annuities which come at a high cost (12% to 22% higher than cash flow matching liability cash flows).

Ryan ALM built a liability cash flow matching product, named the **Liability Beta Portfolio™ (LBP)**, as a cost optimization model that matches and funds the actuarial projected

liability benefit payment schedule for retired lives at the lowest cost given the investment policy restrictions of our clients. The LBP portfolio is composed of investment grade corporate bonds skewed to A and BBB corporate bonds since that represents about 89% of the investable investment grade corporate bond universe. Our LBP also accepts and uses high yield bonds if the client investment policy allows.

The LBP provides a 10% to 15% funding cost savings versus the projected benefit payments of retired lives (liability cash flows) and a 15% to 20% cost savings versus using Treasury STRIPS to defease the same liabilities! This is a serious cost reduction and should be a major consideration of any defined benefit pension plan asset allocation, inflation hedge or de-risking strategy. Yes, the LBP model has some credit risk but very limited since we are using investment grade bonds with several credit filters (to enhance solvency) plus the cost savings provide a large value-added cushion.

The funded ratio should dictate the allocation to bonds. A pension plan with a surplus should have a high allocation to bonds matched to liabilities (core portfolio) and vice versa for a pension plan that has a deficit funded status. Unfortunately, most asset allocation strategies did not respond to the surplus funded status in the 1990s which led to the US pension crisis. With funded ratios at 120% to 150% then, why didn't pensions immunize and secure this victory? Amazingly, instead of increasing their bond allocation in response to a growing funded ratio they reduced it consistently to the lowest bond allocations and highest equity allocation in modern history by 1999.

The allocation to bonds should determine how much of the net liabilities we can cash flow match. ***We recommend funding the first 10 years of Retired Lives on a net liability basis*** (after contributions). In truth, current assets fund the net liabilities not the gross liabilities as contributions are the initial funding source of liabilities. Our LBP model will calculate with precision the cost to fund net liabilities chronologically in a cost-effective manner which will de-risk the plan gradually.

Since liabilities are funded initially by contributions and then investment income, using the LBP model to cash flow match **net liabilities** *chronologically* may be able to fund more liabilities than you think. Contributions tend to be quite large (and in many Public plan cases legislated) such that a 10% allocation to our LBP could often fund the next 10-years of net Retired Lives easily.

Matching liabilities chronologically should also *buy time* for the non-bond assets (Alpha assets) to perform and outgrow liabilities. Given time (7-10 years) most non-bond asset classes tend to outperform bonds. Since liabilities behave like bonds there is a high probability that non-bond asset classes could outperform liability growth over an extended time horizon, especially at today's low yield on bonds (and liabilities) which would enhance the funded status.

Since the pension liability objective is to secure benefits in a cost-effective manner, cash flow matching net liabilities with our Liability Beta Portfolio™ would secure benefits and produce the *optimal* cost savings.

### **Asset Allocation (AA)**

Pension consultants and plan sponsors should consider installing a LBP as the *core portfolio* in asset allocation. The best value in bonds is their cash flows. Bonds are usually not considered performance assets (Alpha assets) especially versus pension liabilities which behave like bonds. By installing the LBP to fund the first 10 years of net Retired Lives, the pension plan buys time for the Alpha assets (non-bonds) to perform. As the Alpha assets perform versus liability growth, thereby enhancing the funded ratio, such excess returns should be transferred (ported) over to the Liability Beta Portfolio™ (LBP) to de-risk more and more liabilities thereby creating a ... **Portable Alpha strategy**. Had this *Portable Alpha* discipline been in place during the decade of the 1990s when funded ratios grew to their highest historical levels with true economic surpluses... there would be no U.S. pension crisis today!

Note – The largest DB pension (CalPERS) removed their 9% asset allocation to inflation hedge assets in 2019.

*Common sense is not common... it requires preferred sense.*