



Some Thoughts on Non-Stable Benchmarks

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New Century Advisors has designed a Constant Maturity 5 year TIPS benchmark (CMTI5™) as an alternative to market-weighted benchmarks for the management of inflation indexed bonds. One attractive feature of the CMTI5™ benchmark is that it allows investors to target a “Stable Point on the Real Yield Curve”¹. The following paper discusses why this is useful for an investor.

Traditional Benchmarks (Issuance Driven)

Most fixed income investors are familiar with issuance driven, market-weighted benchmarks. The Lehman Aggregate Index is the classic example; its makeup and all of its characteristics are derived from what is issued in the marketplace. The Aggregate’s structure is anything but stable. It is driven by the financing needs of the issuers, which are not necessarily consistent with the needs of the investors whose assets are managed relative to the benchmark. Credit is classic example. Corporate borrowers tend to issue when the cost of borrowing is cheap. Moreover, the timing of corporate issuance can be driven by the asymmetry of information (i.e., companies issuing have information that investors do not). Additionally, index vendors change the rules for inclusion periodically, including (excluding) various sectors, size of issues, etc. The impact of changes is shown in the graph below.

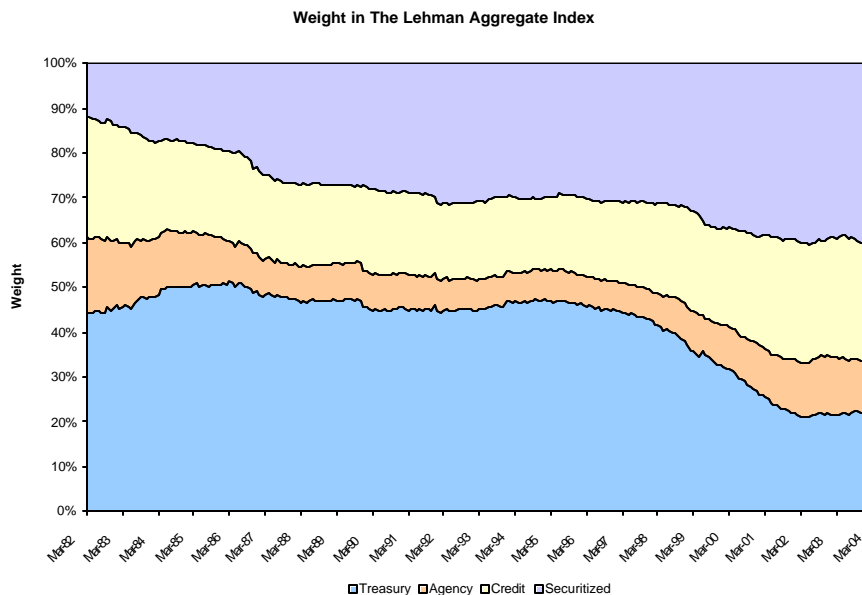


Figure 1: Source Lehman Brothers

Since 1982, Treasuries have gone from the largest constituent of the index to the third largest. The credit component, which includes both corporate and non-corporate issues, has varied widely, going from 25% of the index down to 15% and back up to 25%. The market weight of securitized bonds, such as MBS, ABS and CMBS, has continued to increase throughout the index’s existence.

¹ See New Century Advisors’ presentation “An Introduction to a new TIPS Benchmark”

	Treasury	Agency	Credit	Securitized
Max	51.3%	16.8%	27.5%	40.3%
Min	20.8%	6.5%	15.9%	12.1%
Average	41.5%	9.3%	20.5%	28.7%
Last	22.7%	11.8%	26.3%	39.2%

Figure 2: Source Lehman Brothers, Since 1982

These changes were driven by the issuance of the relevant sectors²³. This issuance has had a dramatic effect on the characteristics of the index. The Aggregate index is now much more negatively convex (having embedded call options) and has a much lower quality rating. Once again, investors not desiring these portfolio characteristics have had no choice, since it has been corporations and mortgage servicers that have been doing all of the issuing.

The Moral Hazard critique of Issuance Based Benchmarks

Issuance based benchmarks contain elements of moral hazard. Generally, the more debt an issuer has outstanding, the more risky its debt becomes. For investors tracking issuance based benchmarks, this is inopportune since as increased issuance, increases the issuers weight in the index. For example if GE, currently 2% of the Lehman Aggregate index, were to double its debt load, it would become roughly 4% of the index. This would force index managers to purchase more, just as its credit worthiness was deteriorating.

The same argument could be made in reverse. In the late 90's when the US Government began to pay down its debt its weight in the index declined dramatically, just as it was becoming (arguably) a better credit. The same is true for any one issuer that increases its credit worthiness by paying down its debt; it becomes a less important part of the index.

The situation is even more troubling when one looks at the spectacular growth of the MBS and Agency portion of the index. The Lehman Aggregate index now has 37% of its market value exposed to two companies (Fannie Mae and Freddie Mac). As these two behemoths issue more debt, the investor tracking the index are forced to absorb it. It is not at all clear if the typical Aggregate index investor realizes or wants to take on this much name specific risk.

² Securitized does include ABS (Since 1992) and CMBS (Since 1999) which could arguably be the result of investor demand.

³ One could make the argument that the issuers were only issuing bonds that investors demanded, so in a roundabout fashion their inclusion into the index is the result of "investor demand". However that assumes that all the issuance is demanded by investors benchmarked to the Lehman Aggregate (or similar) benchmarks. If the demand for Corporates comes from Asset/Liability matchers that do not use the benchmark then the increase in corporate weight in the index is exogenous from investor demand. Furthermore the Treasury component can certainly not be a function of investor appetite, but rather the needs of the Federal Government.

The Convexity Trap

So what does this have to do with the CMTII5™ vs. the TIPS Index? This is a fair question since both indices are made up of a subset of US Treasury issuance and thus have the same explicit credit worthiness. Consider the following, which is one of the strategic objectives of the US Treasury's Bureau of the Public Debt:

“Minimize the cost of the Federal government's borrowing activities.”⁴

One of the ways the Treasury can accomplish this objective is to change the maturity structure of the bonds it issues depending on the level of interest rates. The Treasury has issued a number of different maturities and has changed the relative weightings to meet its objectives.

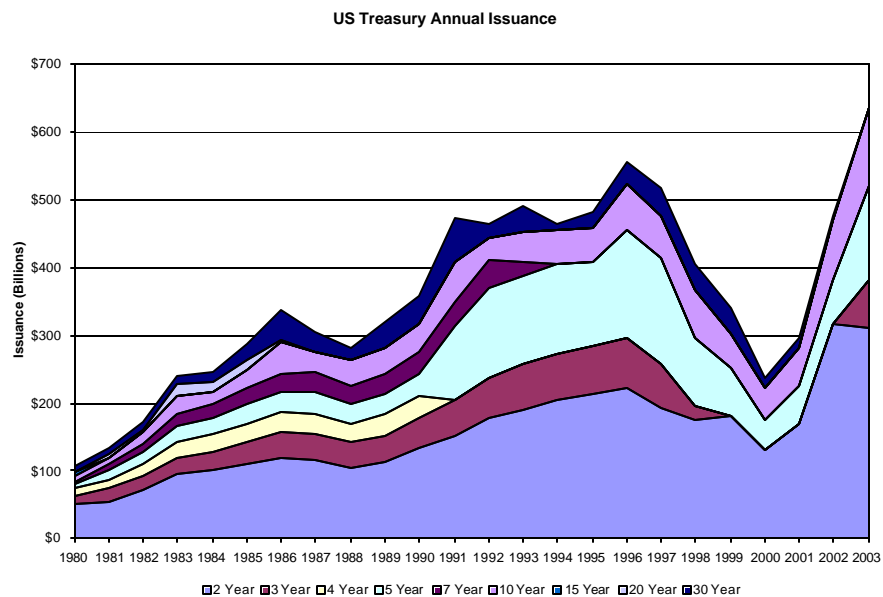


Figure 3: Source US Bureau of the Public Debt, Excluding Bills

This changing issuance profile has resulted in a non-stable average maturity of annual Treasury issuance, ranging from 5 years to 9 years.

⁴ Strategic Plan 2003-2008, Bureau of the Public Debt, U.S. Department of the Treasury, September 2003, Page 3 (<ftp://ftp.publicdebt.treas.gov/oastrategicplan.pdf>)

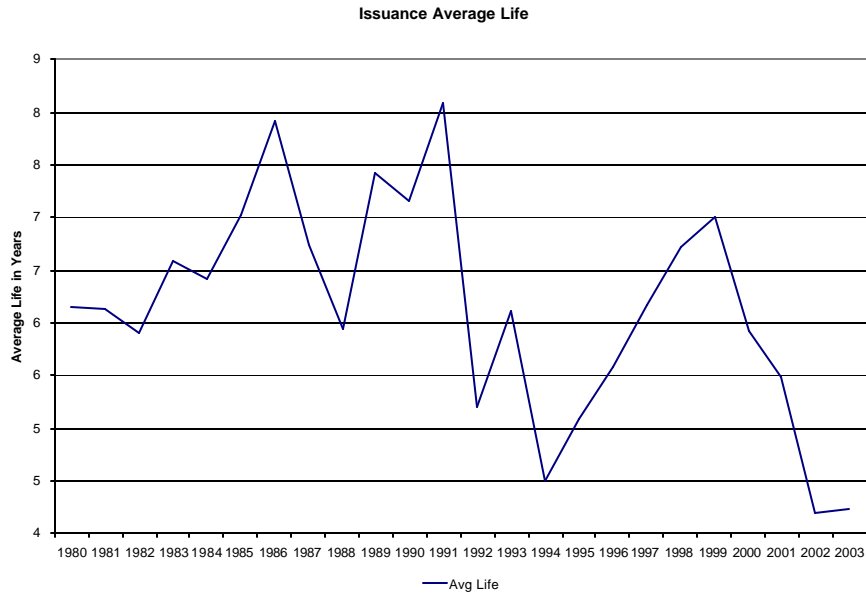


Figure 4: Source US Bureau of the Public Debt, Excluding Bills

The natural strategy to minimize the borrowing costs for the US Government would be to issue shorter debt when yields are high and longer debt when they are low. This is exactly what the US Treasury's Bureau of the Public Debt has done. Since the relative level of interest rates is not known with certainty, the Treasury reacts sensibly; in any year in which interest rates are higher than they were in the previous year, the Treasury shortens the average maturity of its issuance. Conversely if rates are lower in the current year than they were in the previous year, the Treasury lengthens the average maturity of its issuance. Using the average yield of a 10 year (the most constantly issued bond) we can plot the average maturity of the new issuance and yields. Looking at the data since 1980 this strategy becomes clear:

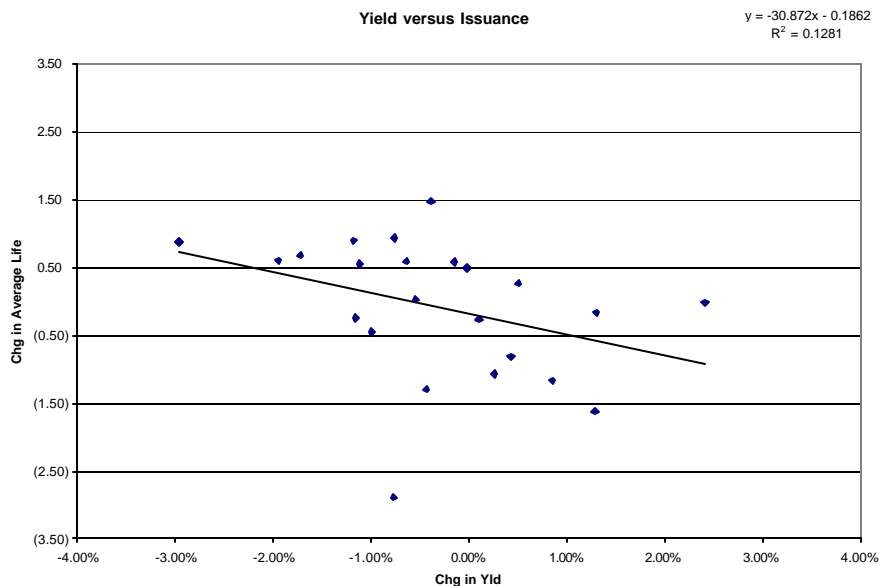


Figure 5: Source US Bureau of the Public Debt and NCA Estimates, Excluding Bills

Those familiar with bond math realize this sounds similar to positive convexity, shortening when yields are rising and lengthening when yields are falling. The problem here is that what the Treasury is doing is lengthening *after* yields have fallen (or shortening *after* they have risen). Assuming that yields have a tendency to mean revert over time⁵ this is exactly what investors do not want to happen. In essence, the US Treasury has created a negative convexity factor to the total issuance of the debt as opposed to any particular bond. All benchmarks which respond to changes in issuance are exposed to this hidden, negative convexity.

This is a different sort of negative convexity than the type that is the mathematical consequence of bonds with imbedded options in them. It may be easier to understand in traditional option terms. The Treasury (or any issuer for that matter) has the option to change the maturity structure of its issuance. While this cannot affect buy-and-hold investors, people investing in an issuance-driven benchmark are selling the issuer this option by continuing to own the benchmark. This hidden cost of convexity can be pronounced, especially when an investor believes they own a positively convex portfolio. At least when investors have an MBS portfolio they are expecting negative convexity, here they are unprepared for this hidden convexity trap.

What about Treasury Bills?

The aforementioned analysis is the same if Treasury Bills are included in the analysis. The Treasury issues bills in amounts greater than in which it issues notes. The chart below shows how bill issuance dwarfs note issuance every year. Keep in mind that bills typically mature in less than one year, so the issuance must be higher to keep the average outstanding bill – note ratio constant.

⁵ Which NCA does over non-short term time periods.

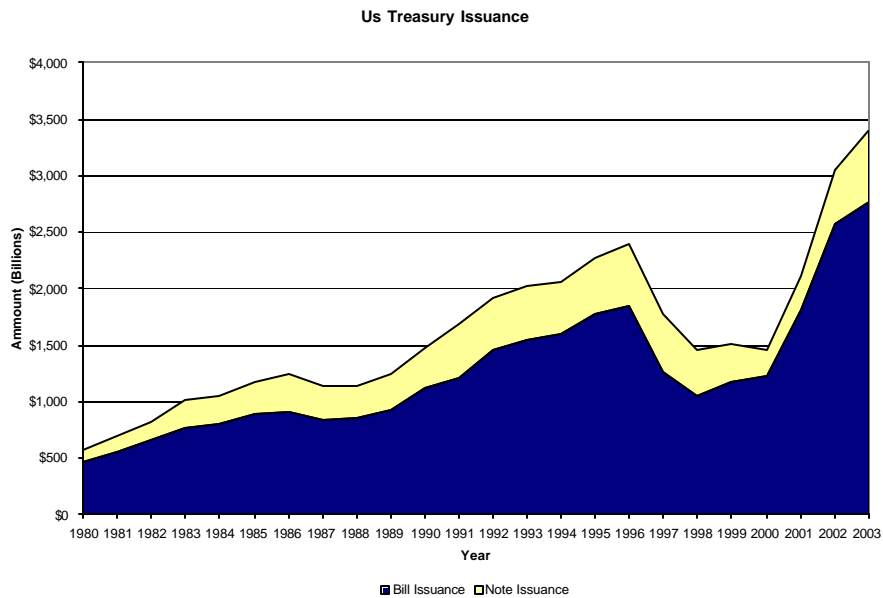


Figure 6: Source US Bureau of the Public Debt

The US Treasury can not only change the average maturity of the bills they issue, but also the ratio of notes versus bills, which can change the average maturity of the outstanding portfolio very effectively. In fact, the negative convexity is even more noticeable when bills are included in the analysis.

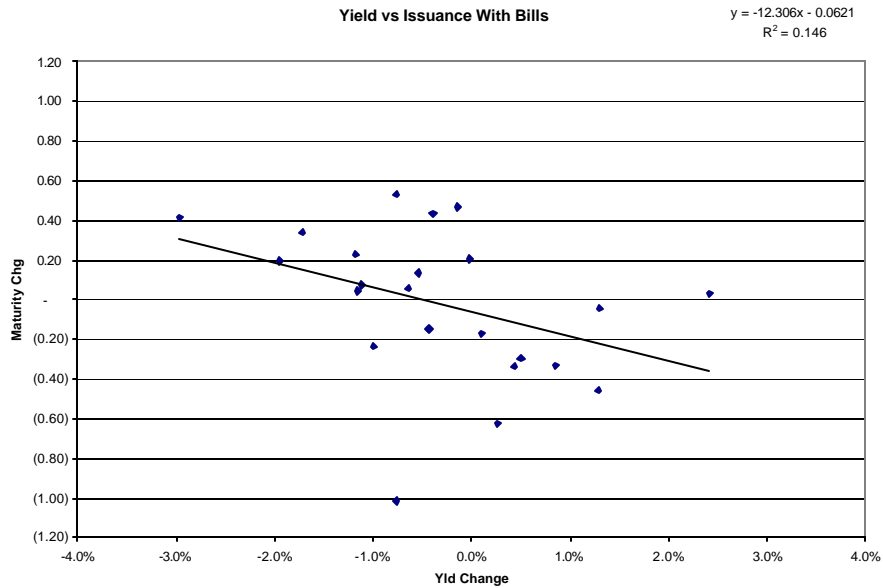


Figure 7; Source US Bureau of the Public Debt and NCA Estimates

The CMTII5™

This pattern is apparent in the TIPS market as well. US Real Yields (as measured by TIPS) are at all time lows. The Treasury has announced that they are planning to issue a twenty year TIPS bond as well as a five year TIPS note. The ratio has not been announced yet, but unless they issue twice as many five years as twenty years⁶, the average maturity of the TIPS market will increase. The Treasury statement shrouds their rationale for a twenty year with comments about asset/liability matchers. However, looking beyond these press statements it is apparent they are simply extending their issuance habits into TIPS (i.e., issuing longer bonds when yields are low).

Real return investors who use the TIPS market⁷ as a benchmark are also exposing themselves to this hidden negative convexity. The index is getting longer just as real rates appear to be rising (and if real rates mean-revert this should be no surprise). This is not a nefarious scheme of the bond markets, just the invisible hand at work.

Unfortunately, the convexity trap is larger in the TIPS world because the outstanding issuance is so much smaller. Since the TIPS program is relatively new with few annual issues, each new security dramatically changes the makeup of the index in ways that do not occur in the nominal world. NCA estimates that when the Treasury issues a twenty year TIPS issue, the benchmark itself will lengthen by 0.6 – 1 year. The average issuance would lengthen in that particular year by five years⁸. In essence, the US Treasury has decided to make the traditional issuance based TIPS benchmarks have a large hidden convexity trap.

To address this, New Century Advisors designed the CMTII5™. The CMTII5™ index has a stable maturity of five years no matter what the Treasury issues and is not subject to the Treasury's efforts to minimize funding costs.

The CMTII5™ benchmark is attractive because it is not susceptible to the whims of the US Treasury issuance, which are not random. The Treasury's mission is to minimize the borrowing cost to the Federal Government, which as a tax payer we fully support, however, as fiduciaries to our clients, we recommend the CMTII5™,

⁶ NCA feels this is quite unlikely.

⁷ Which is the way two most common index providers, Lehman Brothers and Barclays, calculate their benchmark.