SCIENT CAPITAL

Uncertainty Premium in the Pricing of Debt Securities: Evidence from US and India Markets

Background

Basic credit pricing works by translating a default risk into a spread in yields on a given credit. What should we expect if the actual default rates of two securities are very close to each other? Rational credit pricing would imply the yields to be comparable as well. In general, in liquid credit markets (such as US) this is indeed the case and two securities with similar credit risk are priced around similar yield levels.

There is a special case of this question. What if the expected default rates of two securities are close to each other and also both near zero? It would seem that in such a case, we should expect such securities also to be priced close to each other. However, if we consider the spreads between government debt and AAA rated securities the yields are farther off from each other than purely pricing in likely default rates would indicate.

We propose in this white paper that a large part of the difference can be explained by the certainty preference of investors. This proposal is based on the behavioural finance observation that investors value absolute certainty quite highly. This results in them reacting to the smallest degree of uncertainty with a step function in expected rewards.

Observations

- We have inferred that there exists an uncertainty premium which comes into effect whenever the default risk of a given security is non-zero. This premium is the extra spread in the yield of the near-zero-but-not-zero default risk security when compared with zero-default-risk security, even after fully accounting for the potential loss in default.
- The uncertainty premium in US 10 year duration papers is nearly 0.37% p.a.. In India the uncertainty premium is closer to 1.18% p.a.
- In developed markets, the uncertainty premium for shorter duration AAA papers is close to zero i.e. the securities are fairly priced. That is probably driven by the much lower default risk of 2 year AAA papers in comparison with 10-year AAA papers.
- In India, the uncertainty premium is high at 1.2% even for shorter duration AAA papers. This indicates an obvious mis-pricing for short duration AAA debt.
- When the uncertainty premium is used to find out the residual credit arbitrage for AA and A rated papers, US markets do not indicate a large possibility for arbitrage. However, Indian markets still suggest a significant residual spread in AA and A rated papers even after uncertainty premium is taken out.

Implications

- For any investor that can live with the very miniscule credit risk of AAA papers, due to the uncertainty premium they are definitely superior to government debt, on a fully risk-adjusted returns basis. In US, this holds only for long tenors while in India it holds for all tenors. Hence for short term debt investments in India, portfolios consisting largely of AAA debt are preferable to those that have government debt in them.
- Unlike their more liquid global counter-parts, AA and A rated papers continue to be under-priced in India. These offer both uncertainty premium (like AAA papers) and credit arbitrage/illiquidity premium (unlike AAA papers). A discerning investor with moderate appetite for credit risk can benefit from both these premia of AA and A rated papers.

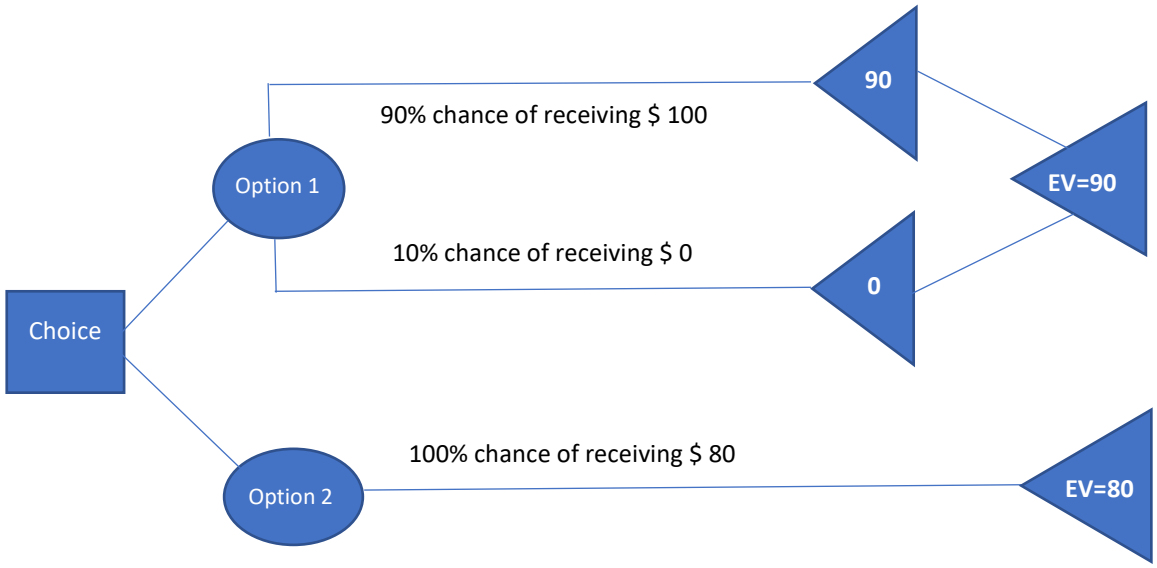
The certainty preference explained

Behavioral economists have outlined a variety of biases inherent in human decision making. Many of these are relevant in investing behaviour. One specific behavioural bias is the extreme preference for certainty. This distorts the relative value human beings attach to fully certainty vis-à-vis very small uncertainty.

For example, in a study conducted to investigate this behaviour, participants were asked to choose between following two options.

- Option 1: 90% chance of receiving $100
- Option 2: 100% chance of receiving $80

The following diagram represents the choices, along with the final expected values (EV).



It is quite clear that the expected value of option 1 is higher (0.9*$100=$90) than that of option 2 ($80). Rational choice is hence option 1. However, majority of participants chose option 2. That is because they value the complete certainty of receiving $80 highly enough to let go of the extra $10 available in option 2 (in comparison with option1).

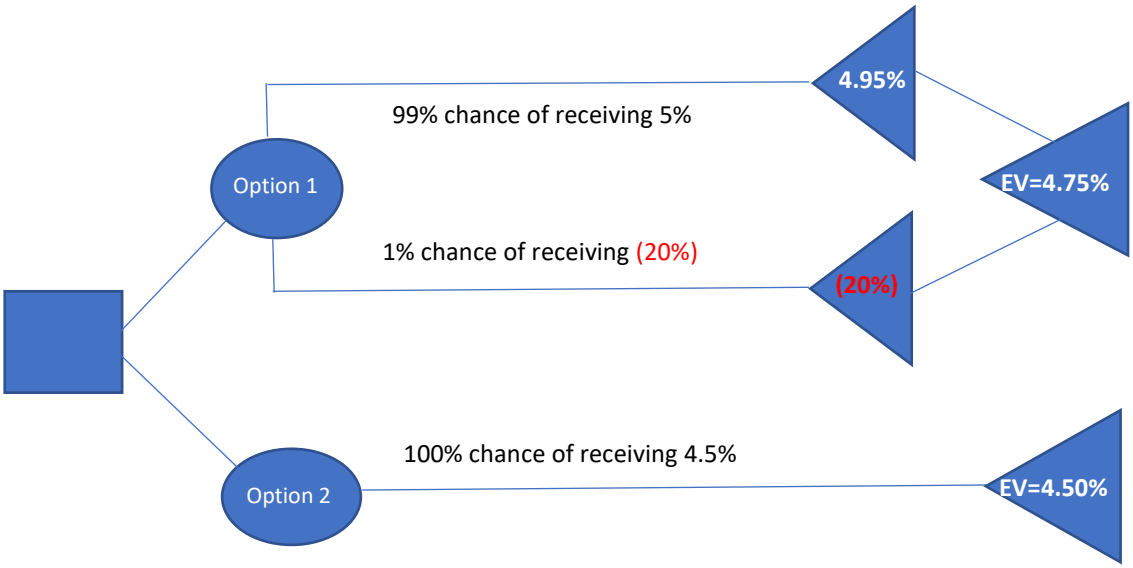
Another way to explain this is the fear of losing a certain $80 (i.e. not choosing option 2) if the 10% chance of getting nothing materializes in option 1. A related behavioural trait of loss aversion kicks in to prompt selection of a zero-loss option 2.

The above inference of certainty preference can be re-stated in the context of securities with zero and near-zero chance of default.

Option 1: 99% chance of receiving 5% returns on investment and 1% chance of losing 20% of the investment (i.e. default situation recovery rate being 80 cents on a dollar)

Option 2: 100% chance of receiving 4.5% returns on investment.

The following diagram represents the choices and the accompanying expected values (EV).



Yet again, investors may prefer option 2 owing to the zero chance of default. However, here too, the probability adjusted return in option 1 is 4.75%. Rational preference would imply selection of option 1.

In real-life debt capital markets, investors neither exclusively choose only zero-default securities nor entirely avoid near-zero-default securities. In other words, both are bought by investors and regularly traded. However, the preference for zero default shows up in the relative yields of these two types of securities (zero default and near-zero default). Investors price the zero-default securities quite highly in relation to the near-zero-default securities – much more than the difference in their default rates (already quite low) would warrant. We examine the data from global debt markets to study this further.

Default (non) history of AAA securities

S&P Global Ratings publishes an annual report which summarizes the global annual default rates. As per their latest report published in 2015, there has never been a default by any AAA-rated and AA+-rated bond within a year of rating. Following is the table:

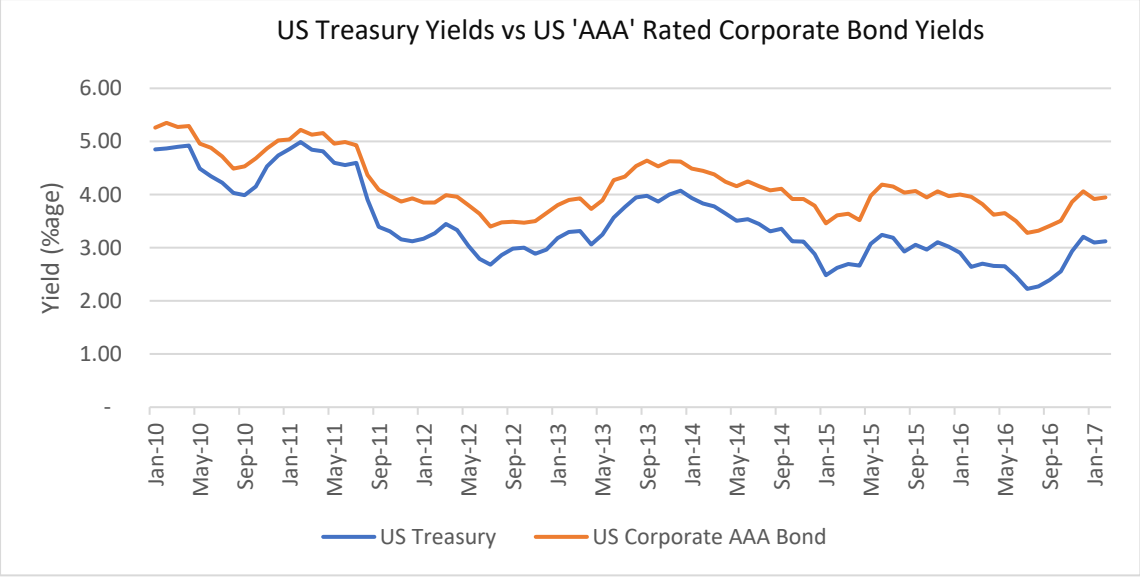
(It should be noted that a security may be rated AAA and subsequently downgraded for various reasons. It may eventually default in its downgraded form. The below table refers to default rate of securities rated AAA or otherwise at the time of default.)

Table 1: One Year Global Default Rates

One-Year Global Corporate Default Rates By Rating Modifier (%)																	
	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC/C
1981	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.28	0.00	0.00
1982	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.68	0.00	0.00	2.86	7.04	2.22	2.33	7.41	21.43
1983	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	2.17	0.00	1.59	1.23	9.80	4.76	6.67
1984	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0.00	0.00	1.64	1.49	2.15	3.51	7.69	25.00
1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	1.49	1.33	2.61	13.11	8.00	15.38
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.78	0.00	1.82	1.18	1.12	4.68	12.16	16.67	23.08
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.31	5.95	6.82	12.28
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.34	1.99	4.50	9.80	20.37
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.90	0.78	0.00	0.00	0.00	2.00	0.43	7.80	4.88	33.33
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	1.10	2.78	3.09	4.50	4.89	12.26	22.58	31.25
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.74	0.00	3.70	1.14	1.05	8.72	16.25	32.43	33.87
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	14.93	20.83	30.19
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94	0.00	1.30	5.88	4.17	13.33
1994	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.00	1.84	6.58	3.13	16.67
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	1.56	1.12	2.77	8.00	7.50	28.00
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.56	2.37	3.74	3.85	8.00
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.35	0.00	0.00	0.00	0.41	0.72	5.30	14.58	12.00
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	1.06	0.67	1.06	0.72	2.60	7.56	9.46	42.86
1999	0.00	0.00	0.00	0.36	0.00	0.24	0.27	0.00	0.28	0.31	0.55	1.34	0.91	4.22	10.45	15.60	33.33
2000	0.00	0.00	0.00	0.00	0.00	0.24	0.57	0.00	0.26	0.89	0.00	0.82	2.06	5.83	10.04	11.61	35.96
2001	0.00	0.00	0.00	0.00	0.58	0.25	0.00	0.24	0.49	0.28	0.52	1.22	5.60	5.84	17.24	22.46	45.45
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.88	1.07	1.58	1.77	4.81	3.27	10.23	19.85	44.44
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.54	0.50	0.97	0.28	1.72	5.34	9.52	32.73
2004	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.67	0.52	0.46	2.35	2.84	16.18
2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.37	0.00	0.51	0.79	2.64	2.96	9.09
2006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.50	0.55	0.82	1.57	13.33
2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.24	0.19	0.00	0.90	15.24
2008	0.00	0.00	0.44	0.41	0.32	0.21	0.60	0.19	0.61	0.73	1.22	0.66	0.68	3.14	3.45	7.59	27.27
2009	0.00	0.00	0.00	0.00	0.30	0.40	0.00	0.42	0.19	1.14	0.00	1.05	0.98	5.96	10.79	17.99	49.46
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.36	0.57	0.00	0.74	2.12	22.73
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.42	1.27	4.47	16.42
2012	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.60	1.44	3.50	27.33
2013	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.76	0.83	4.65	24.34
2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.33	2.74	17.03
2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.22	1.73	2.03	4.26	25.73
Average	0.00	0.00	0.01	0.02	0.05	0.05	0.08	0.14	0.23	0.27	0.54	0.77	1.29	2.24	6.37	9.12	23.71
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.72	1.73	5.34	7.41	23.08
Standard deviation	0.00	0.00	0.07	0.09	0.14	0.11	0.21	0.30	0.35	0.43	0.91	0.83	1.68	2.08	4.88	7.64	11.83
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.44	0.41	0.58	0.40	0.76	1.10	1.40	1.33	3.70	3.09	7.04	8.72	17.24	32.43	49.46

Even though there has never been a default in AAA rated securities, a AAA-rated bond always has a higher yield over a sovereign bond, as we see below.

Figure 1: US Treasury Yields vs US 'AAA' Rated Corporate Bond Yields



Calculating the Uncertainty Premium:

Using first principles in credit pricing, we can say that a bond's yield spread over a sovereign bond of similar tenor is the function of its default probability and its expected loss severity.

Following are the various elements of this calculation:

- Risk free rate which is the yield on sovereign bonds – Y_sovereign
- Expected default-risk-adjusted yield on the non-government security i.e. fair yield to compensate for the expected level of default risk – Y_security_fair
- Total yield on the security after including the likely probability of default – Y_security_PDA
- Actual nominal yield on the security as per prevailing market price – Y_security_actual
- Expected probability of Default of security - p(D)
- Recovery Rate in the event of Default of security - RR_security

One way of expressing the relationship between these elements is as follows. The expected yield on a security is a probability-weighted average of the returns on the bond in two scenarios: one where the issuer defaults and the other one where the issuer does not default:

$$Y\_security\_PDA = [p(D) * (RR\_security - 1)] + [(1 - p(D)) * Y\_security\_fair]$$

In a risk-neutral world this expected return should be neither more nor less, on average, than the risk-free rate. Therefore:

$$Y\_sovereign = Y\_security\_PDA$$

Hence,

$$Y\_sovereign = [p(D) * (RR\_security - 1)] + [(1 - p(D)) * Y\_security\_fair]$$

Re-arranging the above formula we get:

$$Y\_security\_fair = \frac{Y\_sovereign - [p(D) * (RR\_security - 1)]}{1 - p(D)}$$

The uncertainty premium in yields can be expressed as follows

$$Uncertainty\ Premium = Y\_security\_actual - Y\_security\_fair$$

Taking examples from a developed market like the US, we have tried to compare the fair yield of a security based on the above formula and compared it with the actual yield to arrive at the uncertainty premium.

Example 1:
Following are the US treasury and corporate bond yields for an outstanding maturity of 10 years as on 8th March 2017:

10yr US Treasury	2.54%
10yr AAA	3.11%
10yr AA	3.18%
10yr A	3.55%

The Cumulative Default Rate for corporate debt securities in the US is as follows:

Table 2: Average Cumulative Default Rates in US

Average Cumulative Default Rates (1981-2015) (%)										
	Time Horizon (years)									
Rating	1	2	3	4	5	6	7	8	9	10
AAA	0.00	0.04	0.17	0.29	0.42	0.54	0.59	0.67	0.76	0.86
AA	0.04	0.08	0.18	0.32	0.46	0.61	0.76	0.88	0.98	1.09
A	0.08	0.21	0.37	0.56	0.75	0.97	1.22	1.45	1.70	1.95
BBB	0.23	0.61	1.02	1.54	2.10	2.65	3.15	3.65	4.15	4.64
BB	0.81	2.51	4.58	6.60	8.38	10.14	11.61	12.96	14.17	15.27
B	3.93	8.99	13.39	16.81	19.50	21.71	23.55	25.01	26.29	27.46
CCC/C	28.21	38.67	44.55	48.32	51.13	52.19	53.32	54.15	55.18	55.84
Investment grade	0.12	0.33	0.57	0.88	1.19	1.52	1.83	2.13	2.42	2.72
Speculative grade	4.13	8.18	11.72	14.58	16.90	18.84	20.47	21.84	23.07	24.17
All rated	1.76	3.52	5.07	6.37	7.45	8.39	9.18	9.87	10.50	11.08

Following are the parameters of our interest:

i. Y_sovereign (US Treasury Yield) = 2.43%
ii. p(D) for a 'AAA' rated bond in time horizon of 10 years is 0.86%
iii. Assuming a RR_security of 80% (i.e. recovery of 80 cents on a dollar in case of default)

Expected risk adjusted return of the security is:

$$\frac{Y\_sovereign - [p(D) * (RR\_security - 1)]}{1 - p(D)}$$

$$Y\_security\_fair = 2.74\%$$

As noted in above table,

$$Y\_(security\_actual) = 3.11\%$$

Hence the uncertainty premium is the difference between fair yield and actual yield which is 0.37%

Our proposal is that this difference cannot be explained by either default risk or liquidity risk or duration risk. Hence the only plausible explanation for this yield premium of 0.37% is simply the presence of the non-zero chance of default associated with AAA rated papers.

The Indian case

In the Indian context, given the large difference in the liquidity of government debt and AAA rated debt, we may wonder if part of the yield difference is down to liquidity variation. Hence we follow two approaches.

Approach 1: Mapping the US uncertainty premium to India and

Approach 2: Bottom-up calculation of uncertainty premium based on Indian market data

Approach 1:

Given the large difference in nominal risk free rates (~1% in US vs ~6% in India), it does not make sense to directly consider the absolute value of the uncertainty premium we found for US markets above. Hence we scale it up by the ratio of nominal risk-free rates to estimate uncertainty premium for India. The uncertainty premium to sovereign yield ratio in the US is 0.15. 5-year GSec yields in India are 6.86% as of 8th March 2017. Using this ratio (0.15) in the Indian market, we arrive at uncertainty premium for AAA-rated bonds in India of 1.0%.

Approach 2:

The actual yield of a AAA-rated bond (10-year) is 7.79%. In India too (similar to the global experience), there has been no default in the AAA category debt. Hence this spread of 0.93% is ideally the uncertainty premium that a corporate bond demands over a government bond.

i. Y_sovereign (Indian Gsec yield) = 6.86%
ii. p(D) for a 'AAA' rated bond in time horizon of 10 years is 0.86%
iii. Assuming a RR_security of 80%

Expected risk adjusted return of the security will be:

$$\frac{Y\_sovereign - [p(D) * (RR\_security - 1)]}{1 - p(D)}$$

$$Y\_security\_fair = 7.10\%$$

As noted in above table,

$$Y\_security\_actual = 7.79\%$$

Hence the bottom-up value of uncertainty premium in India is 0.70%. The top down value is 1.0% as per approach 1.

Shorter horizons: US markets

We worked with default risk of 0.86% in AAA bonds in US markets above. What happens if the probability of default is indeed very low – say close to 0.04%? Do investors continue to respond to such miniscule increase in default risk with a step jump in yields?

We used the short-term US debt yield data to find this. The following table summarizes the calculations.

Table 3: Uncertainty Premium in US

US	AAA 10 years	AAA 5 years	AAA 2 years
Y_sovereign	2.54%	2.07%	1.34%
RR_security	80%	80%	80%
p(D)	0.86%	0.42%	0.04%
Fair Yield	2.74%	2.16%	1.35%
Actual Yield	3.11%	2.25%	1.36%
Uncertainty Premium	0.37%	0.09%	0.01%

Given this data, we can conclude that at extremely low probability of default, investors indeed value the AAA securities nearly at par with government debt. In other words, the uncertainty premium applies only when the probability of default is nearly 1%. (Since we have used an assumption regarding the recovery rates, it is not prudent to draw any other conclusion from the specific values of uncertainty premium numbers for 5 years and 2 years, which are as low as 0.09% and 0.01% - other than the fact that they are in effect negligible.)

Shorter Horizons – Indian markets

The next question is – do shorter horizons eliminate uncertainty premium in India too, in a manner similar to US? The following table summarizes calculations for India.

Table 4: Uncertainty Premium in India

India	AAA 10 years	AAA 5 years	AAA 2 years
Y_sovereign	6.86%	7.07%	6.49%
RR_security	80%	80%	80%
p(D)	0.86%	0.42%	0.04%
Fair Yield	7.09%	7.18%	6.50%
Actual Yield	7.79%	7.96%	7.45%
Uncertainty Premium	0.70%	0.78%	0.95%

As the table shows, uncertainty premium in India exists for very low probabilities of default too. The obvious inference in this case is as follows – in US, it makes sense to choose government debt or AAA debt for shorter horizons, depending on credit risk appetite; however, in India for short horizons, AAA debt is clearly superior to government debt in risk-adjusted returns.

Going beyond AAA

The benefit of knowing the uncertainty premium is being able to find out the source of credit pricing arbitrage if any for less liquid bonds beyond AAA debt. The idea is that the less liquid bonds may also include credit arbitrage besides the uncertainty premium. If we assume that the total difference between the actual yield and fair yield of AA and A rated bonds is a sum of uncertainty premium and credit arbitrage on the basis of illiquidity and other factors, we can determine the size of this arbitrage using the uncertainty premium taken from Government to AAA bond yield difference.

We have done this exercise for AA-rated and A-rated bonds to derive the excess premium left after the uncertainty premium. To start with, we have shown these numbers are they are in the US market and then extrapolated those for the Indian market as well.

Table 5: Uncertainty Premium in US for lower rated securities

US Markets	10 Years			5 Years			2 Years		
	AAA	AA	A	AAA	AA	A	AAA	AA	A
Y_sovereign	2.54%	2.54%	2.54%	2.07%	2.07%	2.07%	1.34%	1.34%	1.34%
RR_security	80%	80%	80%	80%	80%	80%	80%	80%	80%
p(D)	0.86%	1.09%	1.95%	0.42%	0.46%	0.75%	0.04%	0.08%	0.21%
Fair Yield	2.74%	2.79%	2.99%	2.16%	2.17%	2.24%	1.35%	1.36%	1.38%
Actual Yield	3.11%	3.18%	3.55%	2.25%	2.14%	2.37%	1.36%	1.42%	1.53%
Uncertainty premium	0.37%	0.37%	0.37%	0.09%	0.09%	0.09%	0.01%	0.01%	0.01%
Spread after taking out uncertainty Premium	0.0%	0.02%	0.19%	0.0%	-0.12%	0.05%	0.00%	0.05%	0.13%

As we can see from the table above, in the US debt markets, once uncertainty premium is taken out for AA and A rated papers, there is very little credit arbitrage left in the AA and A rated papers in comparison with AAA rated papers. This is after accounting for the default risk of all the three. That goes to indicate that the credit pricing of the AA and A rated papers in US is quite fair – leaving no room for credit arbitrage. This is probably driven by high liquidity.

A similar exercise carried out for Indian AA and A rated papers shows a different picture.

Table 6: Uncertainty Premium in India for lower rated securities

Indian markets	10 Years			5 Years			2 Years		
	AAA	AA	A	AAA	AA	A	AAA	AA	A
Indian G-sec Yield	6.86%	6.86%	6.86%	7.07%	7.07%	7.07%	6.49%	6.49%	6.49%
Fair Yield of Indian Corporate Bonds	7.09%	7.16%	7.39%	7.18%	7.20%	7.27%	6.50%	6.51%	6.55%
Actual Yield of Indian Corporate Bond	7.79%	8.48%	10.72%	7.96%	8.65%	10.86%	7.45%	8.06%	10.27%
Uncertainty Premium in India	0.70%	0.70%	0.70%	0.78%	0.78%	0.78%	0.95%	0.95%	0.95%
Credit Arbitrage available after accounting for uncertainty premium	0.00%	0.63%	2.63%	0.00%	0.68%	2.81%	0.00%	0.60%	2.77%

As the table shows, for 2 years, if the AA and A rated papers were priced as fairly as their counterparts in the US markets, the credit arbitrage after accounting for uncertainty premium would have been negligible. However, in reality it is quite significant.

The relatively large credit arbitrage available even after accounting for uncertainty premium for AA and A rated bonds is indicative of the mispricing of these credits, opening up the investment avenue for a well-informed investor to make relatively high risk-adjusted returns.

Areas of further research

1. We can extend the analysis to include other emerging markets, to check if the above phenomena repeat for Brazil, Hong Kong etc. We can also repeat the analysis using UK or Japan markets as the base case.
2. The existence of the uncertainty premium at shorter horizons in the Indian market shows the impact of liquidity and structural rigidities – such as FPIs cannot buy corporate bonds below a residual maturity of 3 years, and on which there are quotas and that provident funds are required to hold a certain amount of government debt. Also mutual funds only buy up to 2 years maturity in 70% of their debt funds (Liquid, and Liquid Plus, partially Short Term Funds). The difference between the same bucket uncertainty premium of China, and India, for

example, could be ascribed to structural and liquidity factors, but would represent a market specific fair value.

3. Illiquidity premium in the developed markets can be ascertained by going below BBB or BB rated papers to check if the pricing of these securities is in line with the AA and A rated papers after accounting for default risk. This illiquidity premium can then be transferred to Indian markets to see if the liquidity is priced fairly.

Conclusions:

We conclude that uncertainty premium of 0.37% exists even in relatively liquid market like US debt. However, in such relatively more efficient markets, the uncertainty premium is limited to longer dated papers (i.e. 10 years.) For shorter horizons, US debt markets are highly efficient in that the pricing of near-zero-default-risk securities (AAA) is in line with government debt. Another feature of developed markets is that the AA and A rated securities have no credit arbitrage left after taking out the uncertainty premium.

We also conclude that uncertainty premium of nearly 1% exists in Indian markets. Unlike US markets, in India the shorter tenor AAA papers still carry uncertainty premium – making them an obvious choice over government debt. Also, lower rated papers like AA and A rated securities in India offer credit arbitrage over and above uncertainty premium.