**Problem Set#2**

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1. **Yield Curve Construction:**
2. According to the formular, the forward rate matching the 1Y market swap rate is about: **﻿﻿0.028437999999999963.**
3. The forward rate from one year to two year is about: **﻿0.03283113038626917.**
4. Using the same methods, I could get the result form and the plot shown below:

文本

描述已自动生成

图表, 折线图

描述已自动生成

From the plot I find that the forward rate is fluctuating but always above the swap rate.

1. The Swap rate of a 15Y swap is about: ﻿**0.032236725172570015**.
2. Using the Formular, I got the result of series of zero rate and shown below:

文本

描述已自动生成

From the data, I can figure out that because I use forward rate to compute zero rate, it has the same tendency of the forward rate, which means the zero rate is always above the swap rate but fluctuate over time.

1. The new swap rate and the original swap rate are shown below:

文本

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From the data I could figure out that these rates aren’t equivalent to having shifted the swap rates directly. Because the forward rate rises 100 bps but the swap rate rises less than 100 bps.

1. **(h)** The results of these two problems are shown below:

**文本

描述已自动生成**

To compared with the original data, I plot the relation:

图表, 折线图

描述已自动生成

From this plot, we can see that in a bearish market, as the swap rate increase in a more future time, the forward rate would increase in a steeper tendency.

**(i)(j)** The results of these two problems are shown below:

文本

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To compared with the original data, I plot the relation:

图表, 折线图

描述已自动生成

From this plot, we can find that in a Bull market, the new forward rate is below the old forward rate only at the beginning, but it would increase quite quickly later. And then is would above the old forward rate for a while. For the really long term forward rate there’s no significant difference.