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Problem 1

    a. First, replicate the price and the yield to maturity of the bond, for March 25th (that is, take the price and find the yield and vice-versa). And show your work.

    b. Second, what happened on that day that made the price of the bond increase so much? Can you explain why this company's bond was so affected by it?

    c. Third, anything else interesting you find about the report (explain your answer)?

    d. Second, what happened on that day that made the price of the bond increase so much? Can you explain why this company's bond was so affected by it?

Solution:

a. From the report, we have the following information:

$$\text{Days of accrued interest} = 100$$
$$\text{Days in the coupon period} = 180$$
$$\text{Days to the next coupon} = 80$$
$$\text{Complete coupon periods left} = 54$$

$$h = \frac{\text{days to next coupon}}{\text{days in coupon period}} = \frac{80}{180} = 0.444$$

$$C = \frac{c \times 100}{2} = \frac{4.5\% \times 100}{2} = 2.25$$

- **Replicate the price**

  Given the information of YTM:

  $$y = \frac{BEY}{2} = \frac{3.06\%}{2} = 1.53\%$$

  Thus,

  $$P = \frac{1}{(1+y)^h} \left(\frac{C}{y} \left[1 - \frac{1}{(1+y)^{n-1}} + \frac{FV}{(1+y)^{n-1}} + C \right] \right)$$
  $$= \frac{1}{(1+0.0153)^{0.444}} \left(\frac{2.25}{0.0153} \left[1 - \frac{1}{(1+0.0153)^{54}} + \frac{100}{(1+0.0153)^{54}} + 2.25 \right] \right)$$
  $$= 127.7147$$

  $$\text{AI} = C \times \frac{100}{180} = 2.25 \times \frac{100}{180} = 1.25$$

  $$CP = P - AI = 127.7147 - 1.25 = 126.465$$

  CP= 126.465 is close to 126.25 and the difference may result from rounding error.

- **Replicate the yield**

  Given the information of price:

  $$P = CP + AI = 126.25 + 1.25 = 127.5$$

Thus,

$$127.5 = \frac{1}{(1+y)^h}\left(\frac{C}{y}\left[1 - \frac{1}{(1+y)^{n-1}} + \frac{FV}{(1+y)^{n-1}} + C\right]\right)$$

$$= \frac{1}{(1+y)^{0.444}}\left(\frac{2.25}{y}\left[1 - \frac{1}{(1+y)^{54}} + \frac{100}{(1+y)^{54}} + 2.25\right]\right)$$

I use the goal-seek function in excel to solve this function

$$y = 0.01535 = 1.535\%$$
$$BEY = 2 \times y = 3.07\%$$

The BEY that we've obtained is quite close to 3.06%.

b.
- What happened on March 25, 2020?

  On March 25,2020, "The White House and Senate leaders struck a major deal early Wednesday morning over a \$2-trillion package to provide a jolt to an economy struggling amid the coronavirus pandemic, capping days of marathon negotiations that produced the far-reaching measure," CNN reported. And this \$2 trillion economic stabilization package is the largest of its kind in modern American history, intended to respond to the coronavirus pandemic and provide direct payments and jobless benefits for individuals, money for states and a huge bailout fund for businesses (The-New-York-Times, 2020).

  This was definitely a good signal to the bond market, which may lead to the overall increase of the bond price.

- Why Activision Blizzard?

  The World Health Organization declared a global health emergency at the end of January in light of the coronavirus spread.

  It seems that Activision Blizzard stands to benefit in the current crisis, as the demand for gaming could see traction, given that more people are confined to their homes, eschewing more public forms of entertainment. Between January 31 and March 25, ATVI stock has lost 10% of its value (vs. about 26% decline in the SP 500), which means it has our-performed the market since the start of corona-virus crisis.

  And even before the crisis, Activision Blizzard was doing well with its stock up 25% in 2019, led by continued demand for the Call of Duty franchise. In the current environment, its likely that the game will continue to generate more sales. Trefis-Team believes that Activision Blizzard's Q1 and Q2 results will confirm this reality with higher revenues, primarily for its Activision segment. If signs of coronavirus containment aren't clear by the Q1 earnings timeframe, it's likely Activision Blizzard's stock could continue to outperform the broader markets, especially given it plans to launch several new games, including the World of Warcraft: Shadowlands sometime later in 2020.

  Therefore, investors who are optimistic of the out-performance of Activision Blizzard might be willing to pay higher price for its bond when the good news comes out.

c. The term "YTM"" used in the report is actually referred to what we call BEY in this course while we consider YTM as the periodic rate.

d. Fourth, what does Activision Blizzard do?

   Activision Blizzard, Inc. is a developer and publisher of interactive entertainment content and services. The Company develops and distributes content and services across various gaming platforms,

including video game consoles, personal computers (PC) and mobile devices . Among major intellectual properties produced by Activision-Blizzard includes Call of Duty, Guitar Hero, Tony Hawk's, and Spyro/Skylanders through Activision's studios, World of Warcraft, StarCraft, Diablo, Hearthstone, Heroes of the Storm, and Overwatch through Blizzard Entertainment (Wikipedia, 2020).

References

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