Margin Call Notes

June 3, 2025

0.0.1 Reg-T Long Position at IBKR

- **Initial Cash (your equity):** $\$10,000$
- **IBKR lets you borrow 50%:** $+\$10,000$
- **Total purchase value (Market Value):** $\$20,000$ worth of stock
- **Loan:** $\$10,000$
- **Equity:** $\$10,000$
- **Initial Margin Requirement (Reg-T):** 50%
- **Maintenance Margin (IBKR typical):** 25% of market value

0.0.2 When Do You Get a Margin Call?

A **margin call** occurs when **your equity falls below the maintenance margin**, i.e.:

$$\text{Equity} = \text{Market Value} - \text{Loan}$$

$$\text{Maintenance Margin Requirement} = 25\% \times \text{Market Value}$$

Set these equal to find the threshold where margin call happens:

$$\text{Market Value} - 10{,}000 = 0.25 \times \text{Market Value}$$

$$\text{Market Value} - 10{,}000 = 0.25(\text{Market Value})$$

$$\text{Market Value} - 0.25(\text{Market Value}) = 10{,}000$$

$$0.75(\text{Market Value}) = 10{,}000$$

$$\text{Market Value} = \frac{10{,}000}{0.75} = 13{,}333.33$$

So:

0.1 Interpretation

- If your **stock value drops to $13,333.33**, your **equity becomes $3,333.33**, which is 25% of the new market value.
- You **get a margin call at this point**.

0.1.1 So, how much did the price drop?

$$\frac{20{,}000 - 13{,}333.33}{20{,}000} = 33.33\%$$

0.1.2 In Reg-T long positions:

- Margin call triggers when **market value falls enough** that your **equity $< 25\%$** of the new market value.
- For 50% initial margin, the **critical price drop is ~33.3%**.

0.1.3 Margin Call Formula

To directly compute the **price at which a margin call occurs**, we use:

$$\text{Margin Call Price} = P_0 \times \left(\frac{1 - \text{Initial Margin}}{1 - \text{Maintenance Margin}} \right)$$

Where: * P_0 is the **initial Market Value (or purchase price)**. * Initial Margin = 50% of purchase you funded yourself * Maintenance Margin = 25% minimum equity required

How This Formula Comes Up:

1. Equity is always:

$$\text{Equity} = \text{Market Value} - \text{Loan}$$

2. Loan $= P_0 \times (1 - \text{Initial Margin})$
3. Margin call occurs when:

$$\text{Equity} = \text{Maintenance Margin} \times \text{Market Value}$$

4. Plug in equity:

$$\text{Market Value} - \text{Loan} = \text{Maintenance Margin} \times \text{Market Value}$$

5. Solve for Market Value:

$$\text{Loan} = (1 - \text{Maintenance Margin}) \times \text{Market Value}$$

6. Then:

$$\text{Market Value} = \frac{\text{Loan}}{1 - \text{Maintenance Margin}} = \frac{P_0(1 - \text{Initial Margin})}{1 - \text{Maintenance Margin}}$$

Hence:

$$\text{Margin Call Price} = P_0 \times \left(\frac{1 - \text{Initial Margin}}{1 - \text{Maintenance Margin}} \right)$$

Example (from your case):

- $P_0 = 20,000$
- Initial Margin = 50%
- Maintenance Margin = 25%

$$\text{Margin Call Price} = 20,000 \times \left(\frac{1 - 0.5}{1 - 0.25} \right) = 20,000 \times \left(\frac{0.5}{0.75} \right) = 13,333.33$$

Same result as before, now derived from a general formula.
