more favorable BF$_3$ complex

(a) 
\[
\text{H}_3\text{C} \overset{\text{BF}_3}{\underset{\text{N}}{\text{N}}} \text{C} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} \text{N} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} 
\]

less favorable BF$_3$ complex

sp$^3$ N versus sp$^3$ O  
N is less electronegative 
better e- donor 
better able to take (+)

sp$^3$ O versus sp$^2$ O  
sp$^3$ is less electronegative 
better e- donor 
better able to take (+)

sp$^2$ O provides delocalization (resonance) stabilization for (+), while bonding to delocalized N disrupts the resonance stability of its deloc e-
forming a second bond to any already positively charged O atom to give O$^{+2}$ is not going to happen (too high E)

expected argument at the introductory level: treat this one like (a) and favor the localized e- on O that is stabilized by the deloc e- on the N

(b)  
\[
\text{H} \overset{\text{BF}_3}{\underset{\text{O}}{\overset{\text{CH}_3}{\text{O}}} \text{H}} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} 
\]

(c)  
\[
\text{H}_3\text{C} \overset{\text{O}}{\underset{\text{BF}_3}{\text{N}}} \text{C} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} \text{N} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} 
\]

(d)  
\[
\text{H}_3\text{C} \overset{\text{BF}_3}{\underset{\text{O}}{\text{O}}} \text{H} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} \text{H} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} 
\]

(e)  
\[
\text{H}_3\text{C} \overset{\text{BF}_3}{\underset{\text{O}}{\text{O}}} \text{H} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} \text{H} \overset{\text{BF}_3}{\underset{\text{CH}_3}{\text{O}}} 
\]

this is a question that can result in lots of nice debate! Form the complexes and look at them as real products. The (+) is stabilized by delocalization in both complexes, so this is not like (c). You end up with an analysis that puts the (+) on an sp$^2$ N/sp$^2$ O combination, versus an sp N/sp$^2$ O combination, and sp$^2$ N$^+$ is better than sp N$^+$ (left favored) but sp$^2$ O$^+$ is better than sp O$^+$ (right favored). The actual structure of the starting material does not resolve this: the CNC bond angle is 140˚ (in between sp$^2$ and sp); the conjugate acid pK$_a$ of -4 (later topic in chapter) is probably more consistent with the N reactivity than the O, so that one is indicated
(i), (ii)

(iii)