**Note:** This diagram shows both possibilities for PWSME latchings:

1. Take from before pipeline latch & place before latch (ex. # 5)
2. Take just after latch & place just after latch (ex. # 3). Both are valid & have 2 latch eps.
BPT

Correct

Incorrect

6 stalls

T

NT

0 stalls

BTA ! BTA

BPT = 90% accurate

Branches 60% Taken regard less of pred

BTA = 70% HIT - Assume J is 1st since in

Penalty JR

Clocks = \((0.02)(4) + (0.02)(0.7 \cdot 0 + 0.3 \cdot 2) + (0.10)(0.1 \cdot 6 + 0.4 \cdot 0 + 0.6(0.7 \cdot 0 + 0.3 \cdot 2)) \) = 

NOTE: If BTA or BPT only for BTA then C/T/1/BTA doesn't happen.
\[ \text{IPC ideal} = 6 \]
\[ \text{IPC} = 0.14 \times 2.8 \]
\[ \text{IPC} = 0.14 \times 2.8 = 0.392 \]
\[ \text{CPI} = 0.16 \]

**NOTE:** CPI doubles due to control hazard

\[ \text{CPI} = 0.16 + 0.16 = 0.32 \]

\[ \text{CPI} = 0.32 \]

\[ \text{IPC} = 6 - 6 \times (0.16) = 5.4 \]

\[ \text{IPC} = 0.14 \times 2.8 \]

\[ \text{CPI} = 0.32 \]

\[ \frac{0.16}{0.14} = 1.14 \]

\[ 6 - 6 \times 1.14 = 0.86 \]

\[ \frac{0.86}{3} = 0.2866 \]

\[ \text{IPC cost} + \text{penalty cost} \]