

(0,0), consider the following:

$$\psi: \mathbb{C}^2 \longrightarrow \mathbb{C}^2$$

$$(w_1, w_2) \longmapsto (w_1, w_2, w_2)$$

$$|w_1 w_2| = 1 \quad |w_2| = 1$$

$$w_1 w_2 = x \quad w_2 = y \Rightarrow w_1 = \frac{x}{y}, \quad w_2 = y$$

$$\Rightarrow |w_1| = 1 \text{ \& \; } |w_2| = 1.$$

Anyway, if $w_2 \neq 0$, we can find proper x, y
 $\Rightarrow \psi$ is holomorphic clearly.

Nonsense b b.

We can not have any chart $(*, 0)$. This can be remedied as follows:

$$\begin{array}{ccc} \tilde{U}_1 & \longrightarrow & \mathbb{P}^N \\ \downarrow \scriptstyle \psi & \searrow & \downarrow \\ \mathbb{P} & \longrightarrow & [(\xi_0, \xi_1, \xi_2, \dots)] \\ \downarrow & & \downarrow \\ \in \mathbb{C}^2 & \longrightarrow & (\frac{\xi_1}{\xi_0}, \frac{\xi_2}{\xi_0}, \dots) \in \mathbb{C}^N \\ (\frac{z_1}{z_2}(p), z_2(p)) & \searrow & \downarrow \\ & & (\frac{\xi_1}{\xi_0}, \frac{\xi_2}{\xi_0}) \in \mathbb{C}^2 \\ & & \downarrow \\ & & (z_1, z_2) \end{array}$$

$$\Rightarrow \begin{array}{ccc} \tilde{U}_1 & \longrightarrow & \mathbb{C}^2 \\ \downarrow \scriptstyle \psi & \searrow & \downarrow \\ \mathbb{P} & \longrightarrow & (z_1(p), z_2(p)) \\ \downarrow & \nearrow \scriptstyle \varphi & \\ (\frac{z_1(p)}{z_2(p)}, z_2(p)) \in \mathbb{C}^2 & & \end{array}$$

$\text{im } \varphi$ covers a nbd of (0,0)
except $\{(*, 0)\}$ and $(0,0) = \emptyset$