By Stokes' theorem, for $r < R$ (remembering that p' is the origin)

$$\begin{aligned}
&\Theta(T_\psi, p', R) - \Theta(T_\psi, p', r) \\
&= \int_{\partial B[r,R]} \psi \wedge \left\{ \left(\frac{\sqrt{-1}}{2}\right)^{n-p} \bar\partial \log \|z\|^2 \wedge (\partial\bar\partial \log \|z\|^2)^{n-p-1} \right\} \\
&= \pi^{n-p} \int_{B[r,R]} \psi \wedge \Omega^{n-p},
\end{aligned}$$

where $\Omega = \frac{\sqrt{-1}}{2\pi} \partial\bar\partial \log \|z\|^2$
is the pullback to $\mathbb{C}^n$ of the Fubini-Study metric on $\mathbb{P}^{n-1}$. Since $\psi \wedge \Omega^{n-p} \geq 0$, we have proved the lemma.

Q. E. D.

$$\begin{aligned}
&\ulcorner\ \Theta(T_\psi, p', R) - \Theta(T_\psi, p', r) \\
&= \left(\frac{\sqrt{-1}}{2}\right)^{n-p} \int_{\|z\|=R} \psi \wedge \bar\partial \log \|z\|^2 \wedge (\partial\bar\partial \log \|z\|^2)^{n-p-1} \\
&- \left(\frac{\sqrt{-1}}{2}\right)^{n-p} \int_{\|z\|=r} \psi \wedge \bar\partial \log \|z\|^2 \wedge (\partial\bar\partial \log \|z\|^2)^{n-p-1} \\
&= \left(\frac{\sqrt{-1}}{2}\right)^{n-p} \int_{\partial B[r,R]} \psi \wedge \left\{ \bar\partial \log \|z\|^2 \wedge (\partial\bar\partial \log \|z\|^2)^{n-p-1} \right\} \\
&= \int_{\partial B[r,R]} \psi \wedge \left\{ \left(\frac{\sqrt{-1}}{2}\right)^{n-p} \bar\partial \log \|z\|^2 \wedge (\partial\bar\partial \log \|z\|^2)^{n-p-1} \right\} \\
&= \frac{\sqrt{-1}}{2} \int_{\partial B[r,R]} \psi \wedge \left\{ \bar\partial \log \|z\|^2 \wedge \left(\frac{\sqrt{-1}}{2\pi} \partial\bar\partial \log \|z\|^2\right)^{n-p-1} \right\} \cdot \pi^{n-p-1} \\
&= \int_{\partial B[r,R]} \psi \wedge \frac{\sqrt{-1}}{2\pi} \bar\partial \log \|z\|^2 \wedge \Omega^{n-p-1} = \pi^{n-p} \int_{B[r,R]} \psi \wedge \Omega^{n-p}
\end{aligned}$$