Calculer $\lim_{x\to 0} \dfrac{\pi \sin \pi x}{2x \cos \pi x}$.

$$\lim_{x\to 0} \frac{\pi \sin \pi x}{2x \cos \pi x} = \left[\frac{0}{0}\right]$$

$$\overset{(H)}{=} \lim_{x\to 0} \frac{\pi^2 \cos \pi x}{2\cos \pi x - 2\pi x \sin \pi x}$$

$$= \boxed{\frac{\pi^2}{2}}$$