$$y_n = rac{rac{k}{w}}{x_n - a} = rac{rac{k}{w}}{\sqrt{rac{k}{p_n w}}} = \sqrt{rac{k p_n}{w}}$$

$$x_0 = \sqrt{rac{k}{p_0 w}} + a, \hspace{0.5cm} y_0 = \sqrt{rac{k p_0}{w}}$$

## Value of the pool

$$V_{p_n}(x_n,y_n) = p_n x_n + y_n, ~~ V_{p_n}(x_0,y_0) = p_n x_0 + y_0$$

$$V_{p_n}(x_n,y_n)=\sqrt{rac{kp_n}{w}}+p_na+\sqrt{rac{kp_n}{w}}=2\sqrt{rac{kp_n}{w}}+p_na$$

$$V_{p_n}(x_0,y_0)=p_n\sqrt{rac{k}{p_0w}}+p_na+\sqrt{rac{kp_0}{w}}$$

## **Divergence loss**

$$\delta = rac{V_{p_n}(x_n,y_n) - V_{p_n}(x_0,y_0)}{V_{p_n}(x_0,y_0)} = rac{2\sqrt{rac{kp_n}{w}} + p_n a - p_n \sqrt{rac{k}{p_0 w}} - p_n a - \sqrt{rac{kp_0}{w}}}{p_n \sqrt{rac{k}{p_0 w}} + p_n a + \sqrt{rac{kp_0}{w}}}$$

$$p_0 = p_n = p_{mkt}$$