## **Theorem 1** (Law of Large Numbers).

Let  $(X_n)_{n\in\mathbb{N}}$  be an infinite sequence of i.i.d. variables with finite expected value. Then:

 $\frac{1}{n}\sum_{i=1}^{n}X_{i} \xrightarrow{\text{a.s.}} \mathbb{E}(X_{1}).$ 

t 
$$(X_n)_{n\in\mathbb{N}}$$
 be an infinite sequence of i.i.d eted value. Then: