Theorem 0.0.1 (Radon–Nikodym Theorem)**.** *Let $\mathbb{P}$ and $\mathbb{Q}$ be two probability measures on $(\Omega, \mathcal{A})$ such that $\mathbb{Q} \ll \mathbb{P}$, then there exist a unique positive $\mathbb{P}$-integrable random variable η (the* ***Radon –Nikodym density****) such that for all $A \in \mathcal{A}$,*

$$\mathbb{Q}(A) = \mathbb{E}^{\mathbb{P}}(\eta \mathbb{1}_A).$$

We also write

$$\eta = \frac{d\mathbb{Q}}{d\mathbb{P}}$$