

# Measure Theory

My first exposure to Measure Theory was during my master's in mathematics. Although teaching Mathematics and particularly a subject like Measure Theory filled with abstraction is difficult, my experience of studying the subject was further ruined by the content delivery and notes made available for us. Agreed that in this age, where we have easy internet access and all resources are readily available, I should have made the effort to learn this subject using the sea of resources available out there, I must confess I did not make the effort. The paper was too abstract for me and I thought it did not have many applications, and I somehow made through the course with the minimum efforts. Then during my master's in financial engineering, Measure Theory came back to haunt me. It was only after realizing that the world of Financial Engineering is full of applications of Measure Theory and everything from Derivatives Pricing, Replicating Portfolios and Machine Learning in Finance depends on this paper, did I finally make the effort to go through it again and decided to document my learning this time, trying to make it interesting (interesting to me and my style of learning which is subjective) and trying to document the minimal resources needed for the Financial Applications.

My resources are a mixture of WorldQuant University DTSP MScFE 620 Notes and a beautiful playlist by The Bright Side of Mathematics ([\(86\) The Bright Side Of Mathematics - YouTube](#)). I will keep adding all my sources so that it helps. Most of these sources were References provided by WQU professor Sergio Garcia ([\(1\) Sergio Garcia | LinkedIn](#)).

Also, one important fact: Usually when the mathematics gets too abstract since I am interested in applications, I start to glance through the content instead of deep diving in. But, having gone through the entire course once, I know Measure Theory is being applied in its most abstract form itself and so it is important to keep appreciating the abstractness as we go since the application phase will stay abstract. So, let us get started.