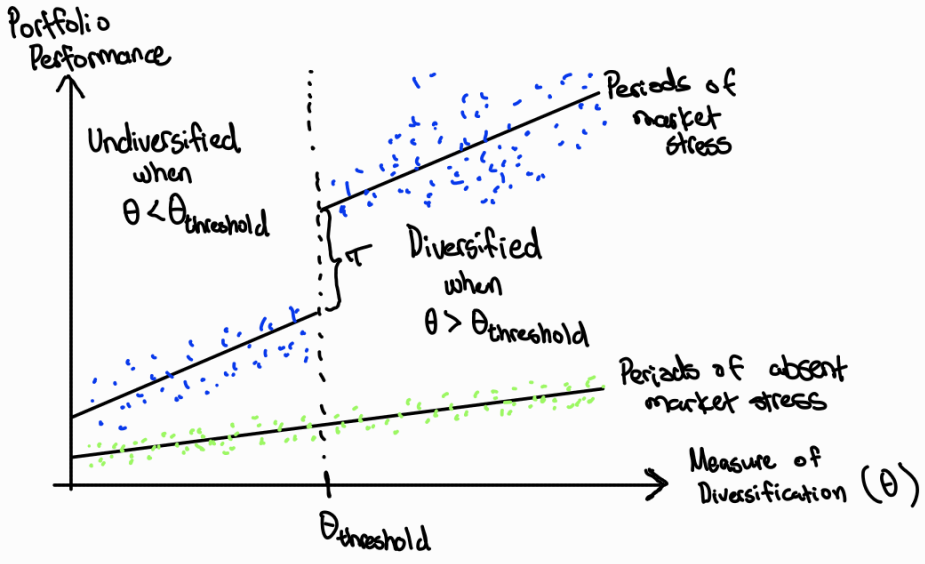
Question: What is the casual impact of DIVERSIFICATION on portfolio performance during periods of market stress?

Idea of Model: Discontinuity Regression Model.

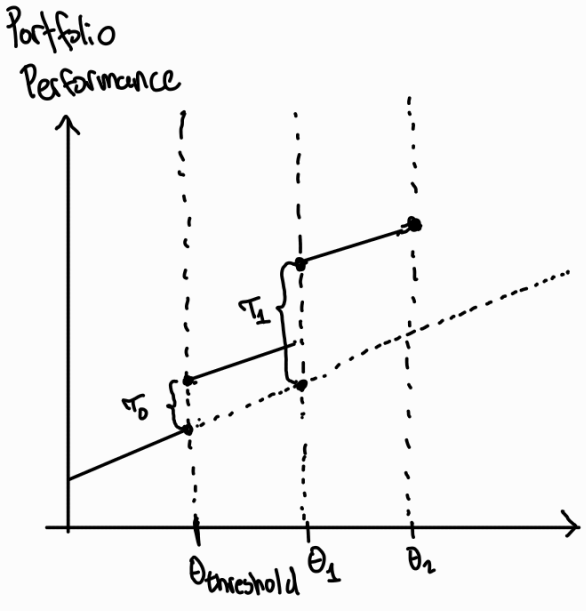


Functional Form of RDD.

$$y_i = \alpha + \beta\theta_i + \tau D_i + \varepsilon_i$$

where $D_i = \begin{cases} 1 & \text{if } \theta \geq \theta_{threshold} \\ 0 & \text{if } \theta < \theta_{threshold} \end{cases}$

Follow-up Question: Is our treatment effect (τ) constant past $\theta_{treatment}$?



Past $\theta_{threshold}$, if τ_n is not constant, at what θ_n is τ_n the greatest?

Data Collection

Acquire data on basket of stocks and assets from Yahoo Finance

→ Construct 1000 portfolios with varying levels of diversification

→ Track performance over time periods of extreme market volatility (VIX)

Data structure

Portfolio	Correlation	Return in time period = volatile
1	0.67	58.1.
2	1	16.1.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
1000	0.28	28.1.