

Using ETF Data to Monitor Systemic Risk

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Overview

In response to the recent near financial collapse, the Dodd-Frank law was passed in 2010, requiring financially based government agencies and 35 major US banks to monitor systemic risk. In the Global Financial Stability Report of April 2011, it states that exchange-traded funds (ETFs) could pose financial stability risks if equity prices were to decline for a protracted period.

Systemic Risk



- The risk of the collapse of an entire financial system
- Imposed by interdependencies in a system.
- Failure of 1 = Failure of All

My Data

Daily historical data back to 1993 for 1172 ETFs

ETFdate	ETFname	FC	PR	slope4to0	acc4to0	RelPer3	RelPer5	RelPer10
335 2012-04-16	AGLS	21.41	0.0000000	0.36647695	-0.14266649	1.9617001	2.2886502	2.6156002
336 2012-04-17	AGLS	21.75	1.5880430	0.48435246	0.10776052	0.3678161	0.3678161	0.8275862
337 2012-04-18	AGLS	21.83	0.3678161	0.23236752	-0.06088648	0.3206596	0.0000000	2.1071919
338 2012-04-19	AGLS	21.83	0.0000000	0.03678161	-0.25313586	0.0000000	-0.1832341	2.5194686
339 2012-04-20	AGLS	21.83	0.0000000	-0.15880430	-0.16597680	0.0000000	-0.5497022	1.7407238
340 2012-04-23	AGLS	21.90	0.3206596	-0.29025827	0.24639922	-0.5022831	0.3196347	1.4155251
341 2012-04-24	AGLS	21.83	-0.3196347	-0.10542419	-0.01602120	-0.5497022	0.4580852	-0.5497022

PC: Price

PR: One Day Percent Return

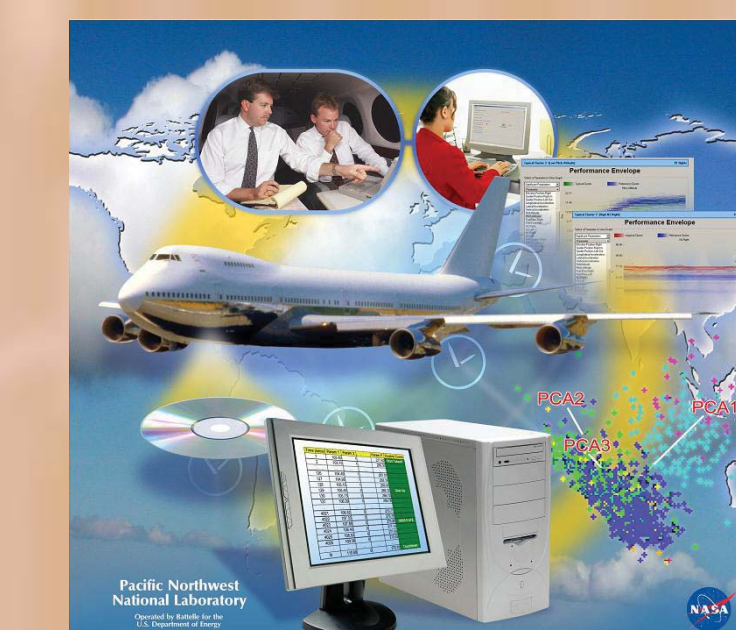
slope4to0: Linear Regression Slope on Prices for last 5 days

acc4to0: Quadratic Regression Slope on Prices for last 5 days

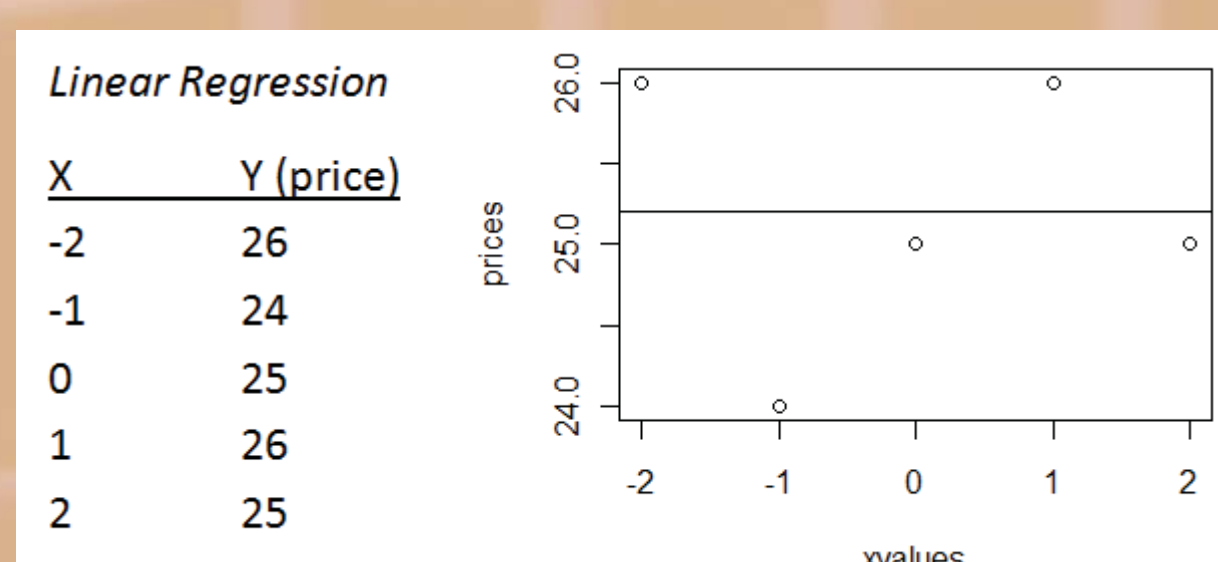
RelPer: Relative Percent of Price for # of days indicated

Analysis

- Datasets created will be analyzed against price data to hopefully find a correlation.
- Anomalator
- NASA's Morning Report

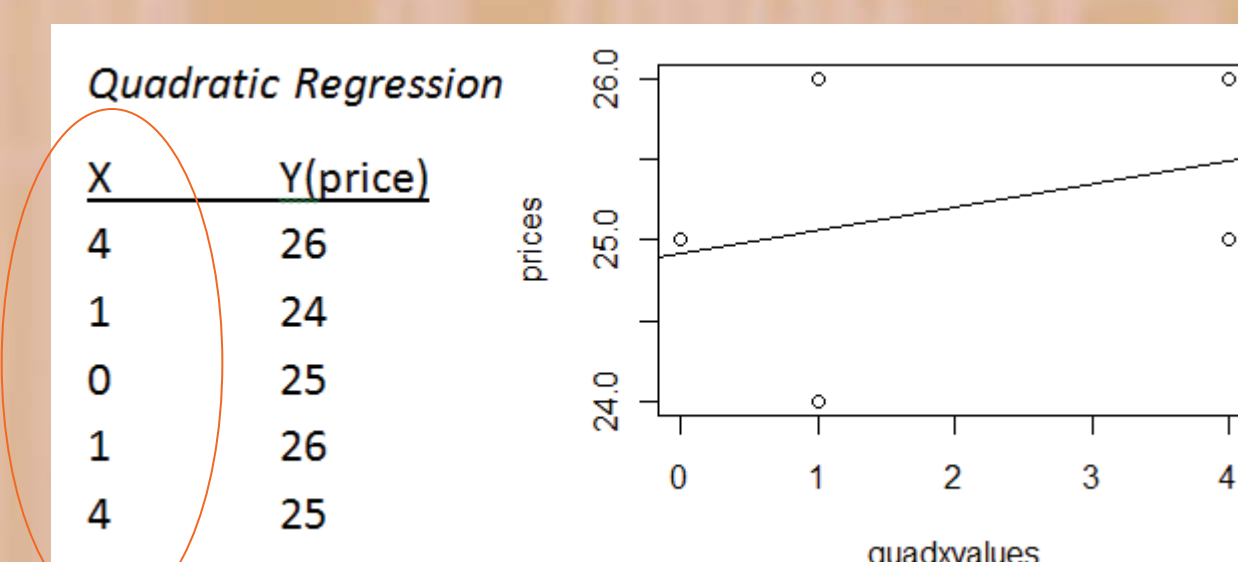


Linear Regression vs. Quadratic Regression



$$y = 25.2 \quad \text{slope} = 0$$

X-values are squared



$$y = .1429x + 24.9$$
$$\text{slope} = .1429$$

Future

This project hopes to find short-term patterns which predict what will happen next in order to tackle a problem in a system before it happens. This will reduce systemic risk and make our financial system more stable.

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