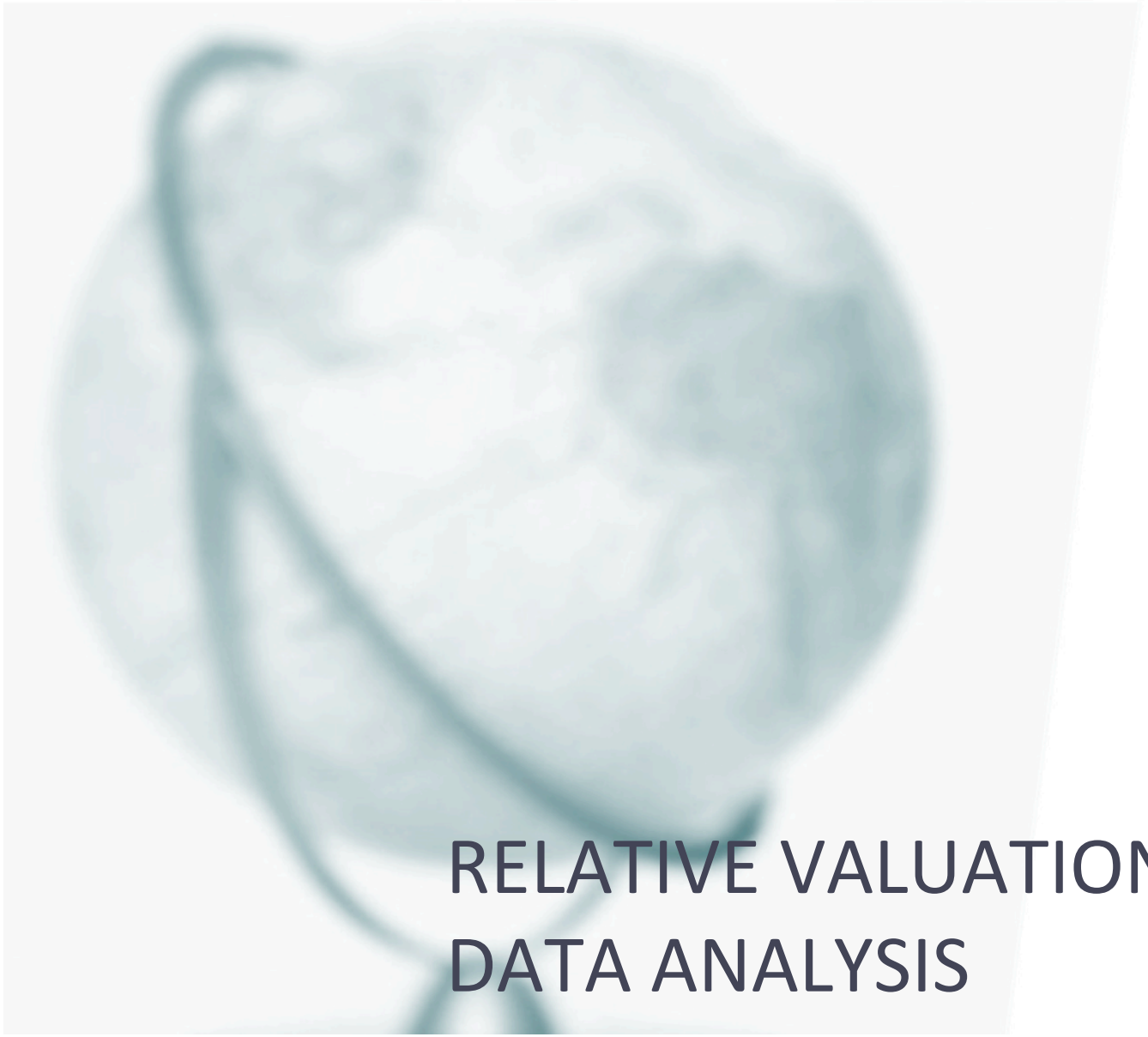

RELATIVE VALUATION: DATA ANALYSIS

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Setting the table

Sector being assessed: Banks in the US

Multiple chosen: Price to Book Ratios

Variables that should matter:

1. Quality of growth
    1. Return on equity
    2. Payout Ratio
2. Expected growth
    1. Historic growth
    2. Expected growth in EPS
3. Risk measure
    1. Beta
    2. Standard Deviation
    3. Tier 1 Capital Ratio
    4. Non-performing loans

The Data

The raw data on all publicly traded banks was drawn from Capital IQ, with the following screens:

- Only banks with market cap > $1 billion were considered
- Only US banks were included
- Of these banks, I included those banks where I could get Tier 1 Capital and Risk Adjusted Assets

The final sample contains 36 banks.

Step 1: Descriptive Statistics

- Compute the standard descriptive statistics for each variable in the data base.
- You are trying to get a sense of the distribution, not just the high and the low, but also the median and the 25^{th} and 75^{th} percentiles.
- In the process, you are also looking for potential trouble:
  - Abnormally low or high numbers
  - Negative numbers that may throw off your assessment

Step 2: Correlations

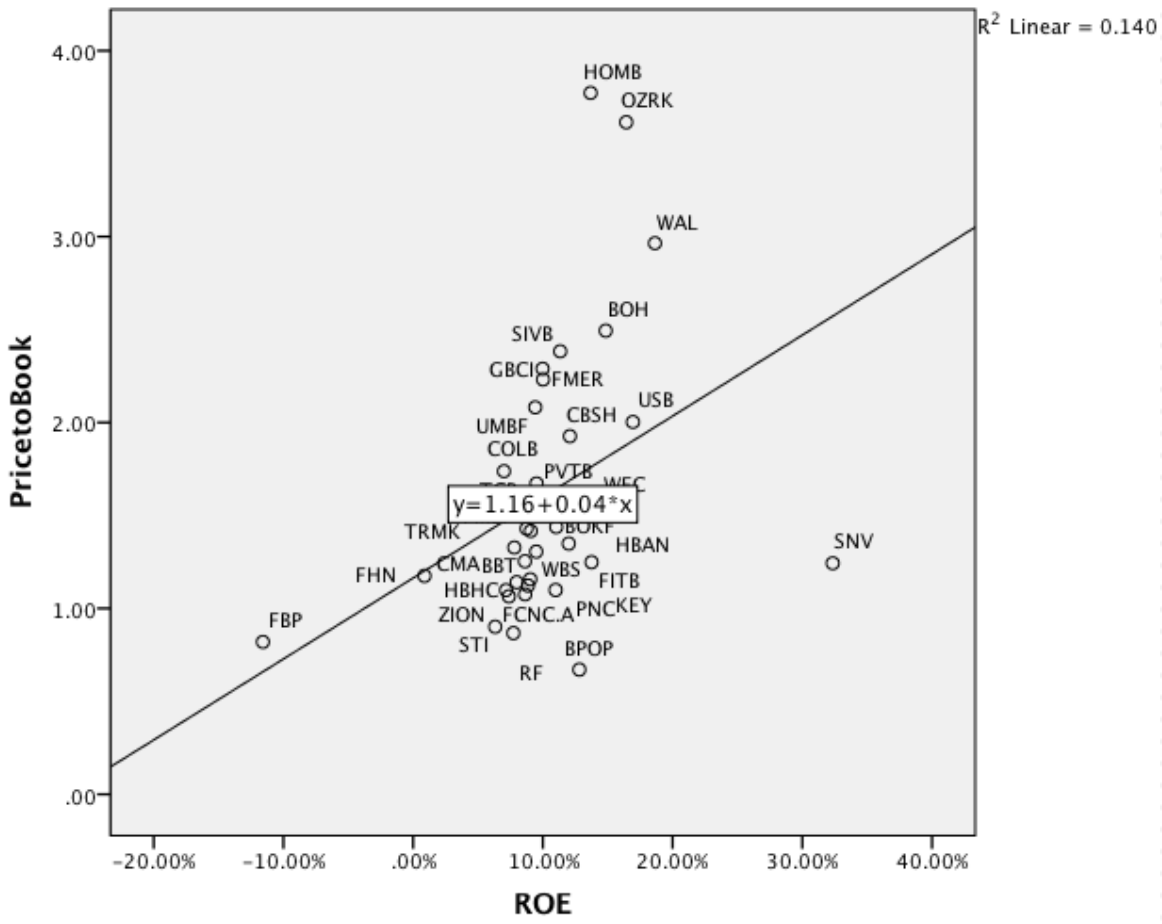
Correlations

		PricetoBook	ROE	Tier1Ratio	Nonperformingloanspct	Beta	Stddeviation	DividendPayoutRatio	ExpectedgrowthinEPS
PricetoBook	Pearson Correlation	1	.374*	.170	-.175	-.414*	-.371*	.083	-.084
	Sig. (2-tailed)		.025	.322	.306	.012	.026	.630	.628
	N	36	36	36	36	36	36	36	36
ROE	Pearson Correlation	.374*	1	-.096	-.212	-.112	-.146	.073	-.063
	Sig. (2-tailed)	.025		.576	.214	.515	.396	.674	.715
	N	36	36	36	36	36	36	36	36
Tier1Ratio	Pearson Correlation	.170	-.096	1	.289	-.047	.043	-.121	.242
	Sig. (2-tailed)	.322	.576		.087	.785	.801	.481	.154
	N	36	36	36	36	36	36	36	36
Nonperformingloanspct	Pearson Correlation	-.175	-.212	.289	1	.445**	.545**	-.296	-.114
	Sig. (2-tailed)	.306	.214	.087		.007	.001	.080	.509
	N	36	36	36	36	36	36	36	36
Beta	Pearson Correlation	-.414*	-.112	-.047	.445**	1	.944**	-.339*	.017
	Sig. (2-tailed)	.012	.515	.785	.007		.000	.043	.921
	N	36	36	36	36	36	36	36	36
Stddeviation	Pearson Correlation	-.371*	-.146	.043	.545**	.944**	1	-.338*	-.061
	Sig. (2-tailed)	.026	.396	.801	.001	.000		.044	.726
	N	36	36	36	36	36	36	36	36
DividendPayoutRatio	Pearson Correlation	.083	.073	-.121	-.296	-.339*	-.338*	1	-.171
	Sig. (2-tailed)	.630	.674	.481	.080	.043	.044		.318
	N	36	36	36	36	36	36	36	36
ExpectedgrowthinEPS	Pearson Correlation	-.084	-.063	.242	-.114	.017	-.061	-.171	1
	Sig. (2-tailed)	.628	.715	.154	.509	.921	.726	.318	
	N	36	36	36	36	36	36	36	36

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Step 3: Scatter plots



Step 4: Regressions: Start with the standard

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.196	.506		4.341	.000
	ROE	.038	.018	.328	2.175	.037
	Beta	-.560	.224	-.377	-2.500	.018
	ExpectedgrowthinEPS	-.014	.038	-.057	-.377	.709

a. Dependent Variable: PricetoBook

Step 5: Take out the variables that are not statistically significant

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.094	.421		4.976	.000
	ROE	.039	.017	.332	2.231	.033
	Beta	-.561	.221	-.377	-2.537	.016

a. Dependent Variable: PricetoBook

Step 6: Tweak the regression

- Try different proxies for growth, risk and quality of growth. See if one of them works.
- If you have outliers, you can consider removing them but try to be symmetric. If you remove a really high number, remove one that is really low as well.
- Don't fight the data.

Step 7: The final regression

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.377	.703		1.958	.059
	ROE	.041	.017	.351	2.369	.024
	Beta	-.545	.219	-.366	-2.482	.019
	Tier1Ratio	.051	.040	.186	1.265	.215

a. Dependent Variable: PricetoBook

Step 8: Check your predicted values

- Rank the companies based on actual values for the multiple.
- Look at percent under or over value for each company, based upon predicted value from regression.
- See if you get a bunching together of under valued companies near the top of the list and over valued companies near the bottom.