A Data First Approach to Understanding Market Values

Overview
The valuation industry has been largely untouched by the advances in statistical analysis, despite being a data rich field. We, the Michigan Data Science Team, formed a partnership with Adamy Valuation, a Michigan based valuation firm, to identify and address pain points in their data pipeline. Adamys need to justify and explain the results to their clients constrained with Adamy Valuation, a Michigan based valuation firm, to identify and address pain points in their data pipeline. Adamys need to justify and explain the results to their clients.

The Market Approach
Workflow of making a Enterprise Value valuation via COMPS

Figure 1: Work flow of Market Approach

Figure 2: Analysis of industrials dataset

Understanding the Data
The Market Approach
Workflow of making a Enterprise Value valuation via COMPS

Figure 1: Work flow of Market Approach

Figure 2: Analysis of industrials dataset

Figure 3: Machine Learning Approach to Company Valuations

Figure 4: Splitting Data for Training and Testing

Figure 5: Training Three Linear Regression Models: OLS, LASSO (L1 Regularization), and Ridge (L2 Regularization)

Data Pipeline
Features
1 Total Revenue [LTM] USDmm
2 EBITDA [LTM] USDmm
3 Ebitda Margin [LTM] %
4 Return on Assets [LTM] %
5 Return on Equity [LTM] %
6 EBITDA Margin [LTM] %
7 EBITDA / Interest Exp. [LTM] %
8 Total Debt/Equity % [Latest Annual]
9 Total Debt/Capital % [Latest Annual]
10 Capex as % of Revenues [Latest Annual]
11 EBITDA, 3 Yrs Growth % [LTM]
12 Total Revenue, 3 Yrs Growth % [LTM]
13 EBITDA, 5 Yrs Growth % [LTM]
14 Total Revenue, 5 Yrs Growth % [LTM]
15 EBITDA, 10 Yrs Growth % [LTM]
16 Other as % of Sales [Latest Annual]
17 Return on Sales [Latest Annual]
18 Total Debt/Capital % [Latest Annual]
19 Total Debt/Equity % [Latest Annual]
20 EBITDA / Interest Exp. [LTM] %

Results and Analysis
The market approach does consistently well. There is much room for improvement in our models but they have the advantage of not requiring man hours to compute an approximation. We believe with fine tuning they will be a tool to provide useful insight. In addition to predicting Enterprise Value, our models were also able to validate the literature’s claim on which features were most significant in determining market value.

Future Work
- Test our data pipeline across different industries to gain cross sector insights
- Incorporate new features and fine tune non linear models on data
- Create a clustering and valuation pipeline for market approach

Figure 6: Distribution of residuals on 20 held out companies

Figure 7: Top 4 features as determined by each model