



Citi Ventures Project

UTILIZING ALTERNATIVE DATA TO PREDICT 10YR TREASURY PRICES

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Key Insights

Deliverable

- ▶ **Innovative idea:** Application of Google Search words that mimic empirical fundamental bond price drivers such as economic growth, inflation, employment and market dynamics.
- ▶ **Impact potential:** we identified a number of statistical variables via Google Trends that predicted average monthly bond prices – 'Hot Stocks, LinkedIn, Organic.Dog.Food, overdraft, restaurants, Social Security Benefit'.
- ▶ **Strength/quality of the product:** 0.71 R^2 . The model was run over monthly average bond prices due to month-only data for the independent variables. We would like to add more granular data.
- ▶ **Customer and market acceptance:** simple to implement and positive results.
- ▶ **Ease of implementation:** publically available data – nearer term estimates are daily which may improve performance.
- ▶ **Evidence and data back-test:** strong OSR2 of 0.71 (30% of total observations), in-line with the Training data set.

Google: Economy-linked searches

Fundamental Causal Drivers

- ▶ **Economic Growth:** GDP, ISM, Retail/Auto sales
- ▶ **Inflation/Prices:** CPI, Interest Rates
- ▶ **Employment:** Payroll, Jobless Claims
- ▶ **Market Structure:** Volatility, Equity Market pricing/volume

Intuitive Alternative Data

Utilizing Google Trend Data

- ▶ **Economic Growth:** restaurants near me, outlet mall, credit score, mortgage rate, ticketmaster, organic dog food, first class tickets, best investments
- ▶ **Inflation/Prices:** overdraft, cheap rent, pay day loan
- ▶ **Employment:** LinkedIn, glass door, professional education.
- ▶ **Market Structure:** bull/bear market, rate trader jobs, bitcoin

Regression: 0.71 R², Stat-significant

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	142.63486	3.46470	41.168	< 2e-16	***
hot.stocks	-0.12158	0.02640	-4.606	1.60e-05	***
LinkedIn	0.09288	0.02569	3.615	0.000533	***
Organic.Dog.Food	-0.07937	0.02839	-2.796	0.006529	**
overdraft	-0.16999	0.03111	-5.464	5.52e-07	***
restaurants	0.08976	0.03607	2.489	0.014977	*
social.security.benefit	-0.12320	0.03689	-3.340	0.001295	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.672 on 77 degrees of freedom

Multiple R-squared: 0.7062, Adjusted R-squared: 0.6833

F-statistic: 30.85 on 6 and 77 DF, p-value: < 2.2e-16

Test-Set: 0.71 OSR2 = Useful

```
> pred = predict(citiModtrain, newdata = test)
> SSE = sum((pred - test$AvBond1M.FWD)^2)
> train.mean = mean(train$AvBond1M.FWD)
> SST = sum((train.mean - test$AvBond1M.FWD)^2)
> 1 - SSE/SST
[1] 0.7090157
```