Using Google Trends to Predict Retail Sales

Looking at search data for more robust business forecasts, PwC investigates

Highlights

- Publicly available search data, in some instances, may be a better substitute for predicting total store or top-line sales performance than a company's own top-line sales figures.
- Our analysis provides some evidence to suggest that Google Trends can be a powerful addition to industry players' forecasting and planning toolkits.
- If you're not Googling yourself, you should.

Forecasting retail sales is an imprecise but increasingly essential science. In today's hypercompetitive business landscape, an accurate sales forecast can be a make-or-break asset, one that contributes directly to top- and bottom-line performance.

The modern forecast method applies sophisticated calculation algorithms on any number of macroeconomic and microeconomic variables, including weekly sales data, prior year results, preseason and trended product-level plans, real estate sales predictions, catchment area demographics and weather analytics. The pool of potential data sources can go on and on. From the traditional menu of data sets, trended historical sales performance is often the key ingredient used to develop retail sales forecasts.

However, in the hunt for additional and better sources of information, what other data sets might be helpful? One such potential signal in the noise may be our collective search history, and more specifically, what we all are Googling.

In fact, we found that publicly available search data, in some instances, may be a better substitute for predicting total store or top-line sales performance than a company's own top-line sales figures. We correlated quarterly Google Trends data with historical quarterly sales performance for a set of prominent retailers and brands and then compared it with the model using a company's own sales history. In each instance, a model built on Google Trends data alone significantly outperformed a model based on purely historical sales. Moreover, we found that in 75% of our testing scenarios, top-line sales forecasts for test periods (which had been excluded from the model building periods) made with only a retailer's Google Trend performance were more accurate than simple forecasts made with a retailer's own sales history.

Are we suggesting that retailers replace sales history with Google Trends data? Absolutely not. However, we feel our analysis provides some evidence to suggest that Google Trends can be a powerful addition to industry players' forecasting and planning toolkits.

In short, if you're not Googling yourself, you should.

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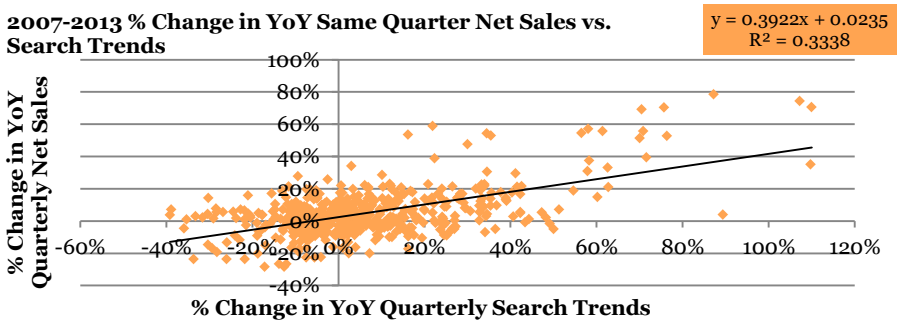
How Google Trends beats a company's own sales history

Google Trends (*www.google.com/trends*) is freely available data based on Google searches that shows how frequently a word or phrase is searched for by region or globally. Google Trends data is accessible to anyone with a Google account.

To put the power of Google Trends to the test, we created a proof-of-concept model that compared strength of correlation with top-line performance between Google Trends of a company name search and a company's own historical sales data for a US-based retailer. For example, we correlated year-over-year percentages of same-quarter Google Search growth with historical sales data over the same period and compare it with the model using year-over-year historical growth for the same period from the trailing year. In other words, we tested if Google Trends data changes from the third quarter in 2012 to the same quarter in 2013 could better explain the sales growth over this period than using actual sales growth from third quarter 2011 to third quarter 2012.

The results? In each instance, a model built on same-quarter Google Trends data significantly outperformed models based on historical sales data. In the long term, we found that historical year-over-year same-quarter sales growth only explains 6% of current year-over-year same-quarter sales growth, while Google Trends data explains 52%. A broader sample indicates that the magnitude of correlation between Google Trends data and sales growth is also strong. In fact, we found that a 1% improvement in Google Trends data translates to 0.4% in sales growth.

Same quarter YoY growth in search trend shows significant positive correlation with net sales growth over the same time period



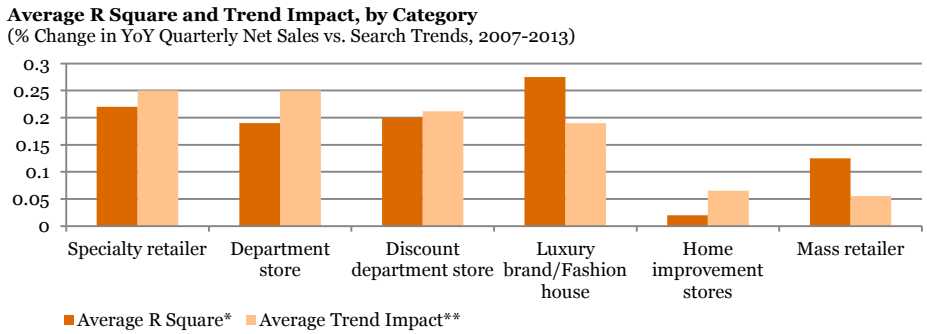
Source: Google, Company 10-Ks, Kantar Retail IQ

This relationship is not simply a statistical correlation in hindsight; rather, it is forward-looking predictive. To prove this, we compared predictive models based on a five-year historic sample with a two-year test period for Google Trends. We found that this search data more closely predicted future sales in six out of eight quarters.

Knowing that shoppers use search technologies to locate nearby brick-and-mortar stores, we also investigated whether Google Trends data could predict traffic in physical stores. Our initial analysis shows search data positively correlates with both store and online performance and suggests it can be used as a bellwether for overall brand performance.

It's worth noting, however, that the predictive accuracy of Google Trends data varies by retail category. In our analysis, the outcome was most correlative for specialty retailers and department stores and least correlative for home improvement stores and mass retailers, with discount and luxury players in the middle. Specialty retailers may show the highest correlation because they are closely associated with the particular brands they carry; as a result, brand search data and sales performance are more closely connected. Also consider that mass retailers and home improvement stores may offer thousands of brands. As such, searches for a particular brand do not as accurately forecast sales. Location, product assortment and customer service may be of more significance to these larger retailers.

Predictability varies by category, with specialty retailers and department stores showing the most correlation.



Source: *Google, Company 10-K's, Kantar Retail IQ*

** R Square indicates how much variability of a dependent variable can be explained by independent variable(s) it is correlated against*

*** Impact measures the proportion of the change in a retailer's Google Trends data correlated to the change in the same quarter sales growth*

How Google Trends can improve planning and customer insight

Google Trends data can provide insights that could enhance both short-term forecasting and planning models as well as inform long-term strategic decisions.

To anticipate shopper behavior, companies could develop robust models that predict customer preferences by demographics, geographies and seasonality. Our analysis was based on aggregate search versus aggregate sales, but more detailed insights could be gained by more granular analysis. For instance, retailers could correlate sales to search by gender or city as well as relate brand-specific searches to sales of those products. This type of analysis could help a multibrand company better predict sales of individual brands in its portfolio.

Google Trends data can also help inform certain strategic decisions. Increasingly, large retailers are launching smaller stores with differentiated layouts and specialized product assortments to meet changing customer preferences. It's likely that a study of Google Trends data could help retailers adeptly navigate this type of transition in business models.

The benefits of using Google Trends data can extend beyond retailers and brand manufacturers to other organizations in the retail ecosystem. Stock analysts, consultants and private equity firms, for instance, could leverage search data to improve their understanding of a company's sales when researching mergers and acquisitions. More importantly, it can be used as a predictor in the valuation model for future sales performance.

Our initial analysis shows that Google Trends data can deliver deep – and deeply informative – insights into future performance and customer sentiments. We believe this new approach warrants consideration by retailers, consumer brand manufacturers and business ecosystem partners alike.

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