

Macroeconomic Information, Investor Horizon, and Firm-Level Forecasting – The Use of Unconventional Data

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Decomposition of Returns

Making Industries and Countries Effects Explicit

To Better Understand the Importance of Macroeconomic Effects on Individual Firm Level Returns, It is Helpful to Make Country and Industry Effects Explicit

One can rewrite returns as:

$$R_{i,s} = (R_{i,s} - \overline{R}_S) + \overline{R}_S$$

where \overline{R}_S is the sector return of stock i .

In other words, each stock can be modeled as having a sector-neutral (within sector) stock picking component and a sector level component where each component can be forecasted separately, with their own model.

One can further rewrite returns as:

$$R_{i,s,c} = (R_i - \overline{R}_{S,c}) + (\overline{R}_{S,c} - \overline{R}_C) + \overline{R}_C$$

In other words, each stock can be modeled as having a sector-neutral, country-neutral, (for a given country within a sector) stock picking component, a country-neutral sector level component and a pure country-level component, where each component can be forecasted separately, with their own model. All of the components are orthogonal to each other

Macroeconomic forces are likely more pronounced at the country and industry level than at the orthogonalized stock-level.

Dynamic Web Scraping is Technologically Feasible and Producing Value Relevant Information

Websites of many companies that are sensitive to economic conditions can be dynamically scraped to give near real-time revenue information that can be useful for return forecasting.

- It is possible to scrape information from a number of hotels, retail stores, airlines, travel, auto sales sites among others
 - Suppose one is interested in the occupancy of a hotel chain, “Best Bed”.
 - Write a program that dynamically collects the occupancy & room rates for all 6,000+ locations of “Best Bed” for the next 365 days.
 - Accomplished by “scraping” the data from their reservation website. By programmatically entering dates into the reservation system, it returns the number of rooms available for each room type and the price per room. Store this information in a database.
 - One can run the program to retrieve all the data for 365 day ahead occupancy for the entire hotel chain in less than 1 hour.
 - Run this program multiple times throughout the day, capturing real-time changes in estimated occupancy rates and revenue.
- This data can give you stock specific information (relative to the sector) on forecasted company revenues
- If done over the whole lodging industry, it can give you sector level information regarding forecasted future revenues.
- This data can also be helpful for forecasting revenues for other industries as well: airlines, amusement parks, car rentals
- This data might also be indicative of consumer discretionary trends and consumer sentiment several months ahead.
- There are multiple legal considerations that one should be cognizant of regarding web-scraping as this is a developing legal area

What Data Might Be Helpful

Car Leasing and Lending Information is Broadly Available

There are a number of companies that provide software solutions to auto-dealers to help them with their financing and leasing decisions. These software companies resell the de-personalized data to interested third parties.

- A small number of companies exist that provide the platforms through which auto-dealers enter in customer information into a database along with the proposed transaction information, including car make, model, price and the type of transaction proposed.
 - The platform returns the leasing / financing terms for the specific customer.
 - The dealer enters the outcome into the software as to whether a transaction was ultimately completed and at what terms.
- These relatively small number of software companies control a very large share of the market for the car-dealer market.
- These software companies are then selling the data to third parties at time T+1.
- This data can give you stock specific information (relative to the sector) on forecasted revenue and measures of profitability.
- Aggregating the data can give you industry level information.
- This data might also be indicative of broad macroeconomic trends that might be helpful for forecasting country level returns.
 - For example, monthly car sales numbers are a widely followed barometer both for the health of the car industry but also an indicator of overall consumer durable spending and the health of the consumer.

What Data Might Be Helpful

Credit Card Data

Credit card data is widely disseminated both by the major issuers as well as by third parties. The variation on the granularity of the data is substantial as is breadth of the coverage universe.

- Major credit card issuers and POS providers sell industry and sector level reports in near real time.
- Some smaller POS providers are selling company level market transaction data. These databases generally lack the breadth of user-base and/or are for smaller companies.
- Some Internet Service Providers and email service providers are selling Inbox customer receipt data that gives one both the purchaser information on the products bought by the customer along with the sales information at the store.
- Some of these data sets can give you (limited) stock specific information (relative to the sector) and a forecast of revenues
- The broader and more statistically reliable dataset can provide you with more precise industry and sector level data.
- This data might also be indicative of broad macroeconomic trends that might be helpful for forecasting country level returns.
- Many market participants believe that credit card information represents the new analysts “consensus” forecast.

Import and Export Data

It is possible to get the detailed bill-of-lading information for import and export data for all waterborne trade at time T+2

- Data vendor processes every day over 60,000 bills of lading that are filed with the US Customs office.
- One is able to tie the bill of lading data back to a specific product and company details, including cusip.
- One is able to tie specific product imports and exports at the company level.
- One is able to track imports and exports at the sector level.
- One is able to track specific commodity imports and exports to the U.S. country level.
- One is able to track overall import and export levels to the U.S. and imports and exports from the U.S. to 14 international markets.

OECD LEI

It is possible to almost perfectly replicate the OECD LEI Data up to 3 weeks prior to its release. Markets move on the release of this data.

- OECD Data is based on 6-7 different unique indicators for each country for 32 different countries
 - Each one of these national level statistics is publicly released at a different time and is publicly available. Note the OECD will not share with you the specific series they use for a country or the seasonal adjustment methodology or other smoothing techniques they employ.
 - The OECD releases all information for all countries approximately 10 days after the beginning of the month for the prior month (e.g. March 2018 data was released on May 14, 2018).
 - One is able with fairly high precision ($R^2 > 0.99$) to forecast the changes in the monthly OECD release numbers via tracking these statistics individually, again, 3 weeks prior to the OECD release.
- This is a signal that historically, on average, produced notable risk-adjusted returns by forecasting movements in country level indices.
- One is also able to refine the OECD LEI with data that is more predictive of returns than of economic growth.
 - However, one must be cautious for at times the market reacts more to OECD LEI than other variables of interest.
 - One must be cognizant of one's strategy: Predicting true country returns or predicting OECD LEI?

Better Understanding of the Importance of Macroeconomic Effects Through the Use of Alternative Data Sources Has A Number of Important Implications

Researchers should be interested in forecasting each of the components of a stock's return:

$$R_{i,s,c} = (R_i - \overline{R_{s,c}}) + (\overline{R_{s,c}} - \overline{R_c}) + \overline{R_c}$$

- The argument that the Law of Active Management requires signals with wide breadth that work across a wide-swath of sectors does not necessarily hold true.
 - One should forecast each component of returns. The weight that is put on each component in practice need not be “1” but reflect predictive accuracy as well as future predicted importance as a driver of returns.
- Alternative data sources are an important source of information about many of these different components of returns
- The near-real time availability of much of this information has implications for:
 - What one believes is “consensus” estimates.
 - The value relevance of the information contained in quarterly earnings announcement reports (e.g. ERCs)
 - The profitability of private information,

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