

Use Case 2: Global Market Efficiency Impact

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Motivation: Financial markets serve as proxies for aggregate investor beliefs and thus convey important information to financial managers and policy-makers. The efficacy of this role depends on prices of financial assets being accurate barometers of what the assets are truly worth. In other words, they depend on the financial market being efficient, but measuring the efficiency of markets remains a challenge. Griffin, Kelley, and Nardari [1] compare common measures of efficiency (short-term reversal, variance ratios, price delay, post-earnings drift, momentum) across developed and emerging equity markets. Counterintuitively, these measures suggest that, if anything, emerging markets are more efficient than developed markets. In [1], it is argued that these common efficiency measures have “limitations that are featured in our international setting” such as failing to control for the information environment. For example, for a given speed of information incorporation, firms with more news will appear less efficient in their return process—as reflected in the common measures of weak- and semi-strong form efficiency. This underlines the need for a more appropriate measure of market efficiency in an international context.

Activity: Market efficiency measures based on deviations from the law of one price do not suffer from these limitations. Rather than testing predictions of weak- and semi-strong form efficiency about characteristics of a security's return process that are influenced by the information environment, they measure violations of no arbitrage conditions and thus directly capture the degree of market (in)efficiency. Cross-listings are an ideal setting to measure deviations from the law of one price in international equity markets, as they offer prices of a single security type (equity), which further represents a claim on identical cash flows. The quality of publicly available information may be measured using domestic data reported to the government, including investment portfolios information, and comprehensive data on companies such as SEC filings and patent information. For example, hedge funds may trade around SEC reporting dates to obfuscate information relevant to them; this is even though US markets are more efficient [2].

The proposed activity will use the Thomson Reuters Tick History (TRTH; used in [3,4] database to collect intraday price data on a large number of cross-listed stocks across many international equity markets and compute the currency-adjusted, synchronous price parity deviations for each cross-listing pair over a prolonged period of time. With high frequency trading, handling this data requires large storage facilities (around 10TB, compressed) and computational power. SEC filings likely add a similar amount of data. Absolute deviations from price parity are a proxy for deviations from efficient pricing, but only of one equity market relative to another; a large sample of cross-listings will allow us to extract a common factor across all cross-listings on a given market. This common factor can be used as a new market-wide, time-varying measure of pricing efficiency. In order to measure the quality of public information we propose to collect all SEC filings and merge them with the domestic subsection of TRTH.

We can then study a myriad of issues. For example, can differences in efficiency across markets be explained by country/market attributes such as transparency, incentives to collect firm-specific

information [5,6], insider trading/short selling regulations, or financial sector development? Can temporal variation in market efficiency be explained by time-varying market-wide variables such as proxies for funding liquidity trading costs, capital flows, and trading activity?

Analysis will be done with MATLAB and standard statistical software such as R and SAS, with data stored in a relational database, with activity bursting around the acquisition of new data. We are particularly excited by access to the proposed federated cloud infrastructure, with the ability to burst to federation sites and also to AWS, as it will provide our group and collaborators with access to a flexible, extendable computing infrastructure to conduct our research as well as the potential to share our databases with colleagues throughout the world, thereby greatly extending the research impact.

References

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