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Alternative data use in real estate analytics

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Executive Summary

Real estate decision-making has been largely dependent on gut instinct because of data availability constraints. However, with real estate practitioners turning to alternative data in recent years, real estate analytics capable of instantly and accurately identifying future real estate risks and previously overlooked opportunities are becoming an increasingly realistic prospect.

Real estate is treasure trove of alternative data

Real estate, a quintessential alternative asset class, is subject to much tighter data availability constraints than traditional asset classes such as equities and bonds¹⁾. Highly reliable real-time data like trade-by-trade asset prices are not readily observable in real estate markets and, unlike financial markets, the Japanese real estate market has no benchmark indices²⁾.

Japan's real estate market is still plagued by information asymmetries and opacity even today, nearly two decades after the purported fusion of real estate and finance in the early 2000s. Why are the rapidly advancing data science and analytics that are being applied extensively in financial markets largely absent from the real estate market? One often cited reason is a dearth of real estate data.

Today, however, the real estate market is finally becoming more conducive to the practice of advanced analytics despite traditional real estate data's shortcomings. Such analytics are being enabled by alternative data, which have been garnering growing interest in recent years. Real estate values and rents, when not determined by seat-of-the-pants heuristics, are generally appraised using analytical techniques like regression applied to property variables such as lot size, floor area, building age and distance to the nearest railway station. Regression typically uses various property attributes as independent variables to explain property value or rent as the dependent variable, but large data sets on individual properties' sales prices, rents and various attributes tend to be hard to come by³⁾. Moreover, real estate data tend to be inferior to financial market data in terms of not only availability but also accuracy (they embed a certain degree of error), granularity (large data aggregation units), frequency (infrequent observations) and

NOTE

1) In the real estate sector, (traditional) data constraints stem from real estate's distinctive attributes, including that real estate value is created through the use of space and real estate changes hands much less frequently than financial assets.

2) Although Japan's Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and industry organizations publish real estate indices, the Japanese real estate market still does not have a benchmark index like the Nikkei 225 or TOPIX in the equity market.

3) With data on individual real estate transactions generally not publicly available in Japan, information on asking prices/rents are often collected from online property listings by web crawling bots. MLIT publishes real estate sales price information, but such information has shortcomings in terms of publication frequency, timeliness, accuracy and granularity, the last two of which are attributable to data anonymization.

timeliness (long lags between transactions and their observability).

In recent years, alternative data have emerged as new data sources distinct from such traditional real estate market data. The term “alternative data” generally refers to POS data, textual data and data collected from unconventional sources such as IoT devices, social media and satellite imagery⁴⁾. In the real estate sector, alternative data include highly accurate, timely information on buildings’ foot traffic, environs and tenants’ operating performance, none of which was readily available until recently.

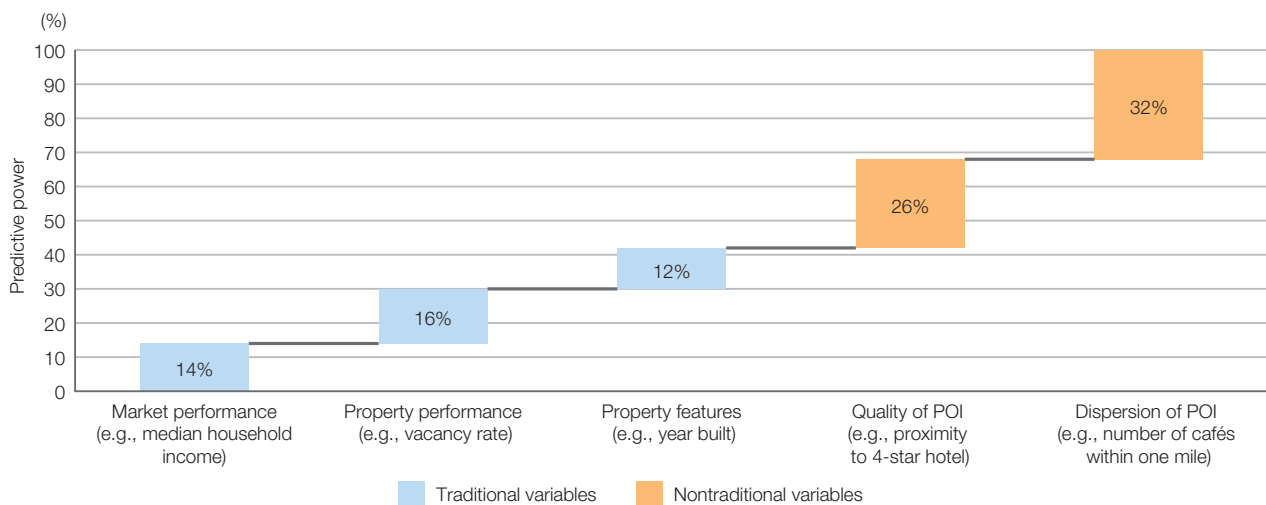
4) Examples of key Japanese alternative data can be found at <https://data.shingan.cloud/en/index.html#top-datasets>.

Real estate professionals, like their counterparts in the financial sector, where such alternative data are heavily used in pursuit of alpha in the wake of recent advancements in machine learning and natural language processing, can now glean valuable insights from alternative data. The former dearth of data on real estate, an asset that creates value through the use of space, has been supplanted by newly amassed alternative data of the spatial variety. Real estate has become a veritable treasure trove of data.

Rent forecasting model derives ~60% of its predictive power from alternative data

How useful are alternative data in actual real estate analysis? A paper by Asaftei et al. published last year by the Urban Land Institute, the world’s largest organization

Exhibit: Nontraditional data’s value in real estate sector



Source: Asaftei et al. (2018), “Getting ahead of the market,” Urban Land, Urban Land Institute

of real estate experts, quantified the predictive power of alternative data versus traditional data with respect to rent growth (see graph).

Using a model that incorporated both traditional variables (e.g., vacancy rates, building age) and nontraditional variables, the papers' authors found that the nontraditional ones accounted for nearly 60% of the model's predictive power. The nontraditional variables were the quality and dispersion of points of interest (POI) within a certain radius of proximity to the subject property. Specific nontraditional variables mentioned in the paper include changes in the number of nearby coffee shops and apparel stores, the number of gas stations within a two-mile radius, the subject building's energy consumption relative to nearby buildings', in-office mobility based on frequency of elevator movement and online ratings of local restaurants and bars.

By deploying APIs to automate the collection of data on such variables and using machine learning algorithms, real estate companies can better analyze future real estate risks and opportunities that are not intuitively apparent or identifiable from traditional data, potentially gaining a leg up over competitors. Such services are in fact already available from several US startups, including SpaceQuant, Mashvisor, SmartZip and Enodo. Alternative-data-driven real estate analytics are growing in prevalence.

Practicing real estate analytics in the big data era

While property owners and data providers are constantly amassing both conventional and alternative data on real estate, analytical technologies also are advancing. Even in Japan, traditional data have been open-sourced to a greater extent than previously anticipated, as exemplified by the Ministry of Land, Infrastructure, Transport and Tourism's public release of property appraisal report data in 2019⁵⁾.

Real estate is finally approaching parity with traditional asset classes in terms of advanced analytics that comprehensively leverage big data collected from both traditional and alternative sources. No longer are real estate analytics constrained by data scarcity. I look forward to data-driven decision-making taking root in the real estate market even in Japan.

⁵⁾ In publishing its 2019 land price statistics, MLIT released not only land prices from 26,000 sites throughout Japan but also the price data's underlying appraisal report information freely downloadable in CSV format.

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