

We introduce a new statistical measure of firm-level informational complexity (ICOM) defined as the reconstruction error from an unsupervised machine learning model trained on firm characteristics. ICOM captures how atypical a firm's profile appears relative to peers, reflecting information-processing difficulty. Our measure is distinct from existing text- or segment-based complexity proxies and has systematic implications for prices. Empirically, firms with high ICOM earn significantly lower future returns, with a decile portfolio spread of 1.47% per month (equal-weighted) and 0.82% (value-weighted). The effect is concentrated in firms with limited investor attention and high limits to arbitrage, suggesting mispricing as the channel.