



## EQUITIES

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# Characteristics Are Covariances: A Unified Model of Risk and Return

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We propose a new modeling approach for the cross section of returns. Our method, Instrumented Principal Components Analysis (IPCA), allows for latent factors and time-varying loadings by introducing observable characteristics that instrument for the unobservable dynamic loadings. If the characteristics/expected return relationship is driven by compensation for exposure to latent risk factors, IPCA will identify the corresponding latent factors. If no such factors exist, IPCA infers that the characteristic effect is compensation without risk and allocates it to an "anomaly" intercept. Studying returns and characteristics at the stock-level, we find that four IPCA factors explain the cross section of average returns significantly more accurately than existing factor models and produce characteristic-associated anomaly intercepts that are small and statistically insignificant. Furthermore, among a large collection of characteristics explored in the literature, only eight are statistically significant in the IPCA specification and are responsible for nearly 100% of the model's accuracy.

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