Performance Attribution: the Harsanyi Method

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Abstract:
We introduce an axiomatically founded approach to performance attribution. Our framework defines a performance attribution problem by incorporating decision makers, feasible actions capturing ex-post realizations, benchmark actions, and a general return function. We propose the Harsanyi attribution function to allocate excess return among all possible teams of decision makers. Attributions to coalitions decompose excess returns into individual attributions and team interaction effects resulting from joint decisions, thereby breaking down performance into a full chart of mutual interactions. We axiomatize the Harsanyi attribution function on the domain of performance attribution problems and prove that it is the unique attribution method satisfying efficiency, outsider independence, and null contribution. Efficiency requires that the full excess return should be attributed. Outsider independence means that a team's attribution remains unaffected by the actions of any external decision maker. Null contribution ensures that a team containing a decision maker who selects the benchmark action gets zero attribution. We present three theorems to facilitate the derivation of the Harsanyi attribution in applications. Finally, we prove that the Harsanyi attribution function satisfies the so-called aggregation property, which we show to be violated when Harsanyi attributions are further allocated to individual decision makers.