Evaluating Equity Curves via Concentration Indexes

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Abstract: Comparing trading systems performances has been traditionally addressed using ratios that allow to get a ranking. The popularity of a ratio depends on its simplicity i.e. on its capability both to be easily computed, and to get results that can be interpreted with reasonably lower efforts. Moreover, the ratio should not depend on the statistical population it is evaluated on, and it should get out pure numbers i.e. a score which is not dependent on any unit of measure. Over the past decades such ideal features have been variously matched by a number of different indexes: [2], [6], [7], [8] [9], [1], and [4] are some examples of ratios that can be built when one takes into account either the annual return of the trading system or a target return, as well as the number of winning trades opposed to the overall number of trades and so on.

The aforementioned remarks are the starting point towards which we moved to introduce a new index called Average Recovery Ratio (ARR). The idea behind it is to use Gini concentration index [3], normalized in the interval [0, 1], in order to compare different equity curves. The advantage of using such a statistical index relies on its simplicity: a pure number can be easily interpreted; besides, it provides a snapshot about the statistical population from which it is derived. Moreover, being a normalized index, its maximum and minimum values are well defined from a theoretical point of view. The intuition behind the use of the Gini coefficient in order to compare different equity curves deals basically with two evidences: on one hand the value of the Gini index itself depends on a target; on the other hand most desirable situation can be represented, from a graphical point of view, by the line of perfect equality: the interpretation and the meaning of this line is intuitive in the context of concentration. In such case, in fact, the perfect equality line describes the ideal situation in which the trading system produces a perfectly smooth equity curve in absence of losses, with performances that are perfectly equally distributed on every single time stamp. Finally, an additional strong reason to use the Gini index is the relation between the index and the second order stochastic dominance through the Lorenz curve [5]: if the Lorenz curves calculated for two different statistical populations do not intersect, then the ranking between those statistical populations can be obtained, with one population dominating on the other one, in the sense of second order stochastic dominance.

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Within the aforementioned framework the structure of the paper is as follows: after describing with more details the intuition behind the ARR, we will discuss its main theoretical properties. We will then conclude with some insights about the power of such newly introduced index, by comparing it with other performance measures tested on a trading system that runs on a number of major financial indexes.

**Keywords:** Equity Curves, Concentration Indexes

**References**


