Positional Portfolio Management

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Résumé. Le but de cet papier est d'étudier une gestion de portefeuille positionnelle. Dans une stratégie de portefeuille positionnelle, le gestionnaire maximise une utilité espérée qui dépend du rang en coupe (position) du rendement du portefeuille. Ainsi la fonction objective traduit le but du gestionnaire d'être bien classé par rapport à ses compétiteurs. L'implémentation d'une stratégie positionnelle repose sur une modélisation a facteurs latents non linéaires pour les rendements des actifs. Le modèle permet de distinguer la dynamique de la distribution en coupe des rendements d'un coté, et la dynamique des rangs des actifs dans cette distribution de l'autre. Nous introduisons des méthodes d'estimation permettant d'analyser le modèle à partir d'un grand ensemble de 1000 actions échangés sur le NYSE, AMEX and NASDAQ entre Janvier 1990 et Décembre 2009. Nous implémentons les stratégies positionnelles de gestion pour différents univers d'actifs. Les stratégies positionnelles ont une performance supérieure à celle de stratégies plus classiques momentum, reversal et moyenne-variance pour plusieurs critères d'évaluations, tout en étant pour certaines moins couteuses en temps de calcul.

Mots-clés. Bien positionnel, Gestion de portefeuille robuste, Rang, Modèle a facteurs, Mégadonnées, Portefeuille équipondéré, Momentum, Aversion au risque positionnelle.

Abstract. In this paper we introduce and study positional portfolio management. In a positional allocation strategy, the manager maximizes an expected utility function written on the cross-sectional rank (position) of the portfolio return. The objective function reflects the goal of the manager to be well-ranked among his/her competitors. To implement positional allocation strategies, we specify a nonlinear unobservable factor model for the asset returns. The model disentangles the dynamic of the cross-sectional distribution of the returns and the dynamic of the ranks of the individual assets within the cross-sectional distribution. We estimate the model on a large set of stocks traded in the NYSE, AMEX and NASDAQ markets between 1990/1 and 2009/12, and implement the positional strategies for different investment universes. The positional strategies outperform standard momentum, reversal and mean-variance allocation strategies for most criteria. Moreover, the positional strategies outperform the equally weighted portfolio for criteria based on position.

Keywords. Positional Good, Robust Portfolio Management, Rank, Factor Model, Big Data, Equally Weighted Portfolio, Momentum, Positional Risk Aversion.

1 Extended abstract

The management fees of portfolio managers should be designed to reconcile the objectives of these managers with the objectives of the investors. They depend on the asset under management for mutual funds, and also on the returns of the portfolio above some benchmark threshold, the so-called high-water mark, for hedge funds [Aragon and Nanda (2012), Darolles and Gourieroux (2014)]. These designs might be not entirely satisfactory and induce spurious portfolio management. For instance, the effect of high-water mark can lead managers to take too risky short term positions and use a high leverage. Similarly, to increase his/her market share, that is the asset under management, the manager has to get better performance than his/her competitors. In this respect, the manager might be more interested in relative performance than in absolute performance, especially when the journals for investors write lead articles or even make their cover page on the ranking of funds.

The traditional Finance theory assesses the quality of a portfolio management strategy by considering the expected (indirect) utility of the portfolio value, or of the portfolio return. A portfolio with 10% expected return is preferred to a portfolio with 8% expected return for a given level of risk. However, this preference ordering can be questioned if we account for the *context*, that is, for competing portfolio managements. Do we prefer a 10% return when the competing portfolio return is 20%, or a 8% return when the competing portfolio return is 5% ? Indeed, with 8% return the portfolio manager is number one, whereas he/she is not with 10% return. Economic theory uses the term *positional good* to "denote the good for which the link between context", i.e., the behaviour of other economic agents, "and evaluation is the strongest", and the term *nonpositional good* to denote that for which the link is the weakest [Hirsch (1976), Frank (1991)]. Positional theory has proved useful to explain the escalation of expenditures in armaments, the race for technology in electronic financial markets [Biais, Foucault, and Moinas (2013)], the negative association between happiness measures and average neighbourhood income [Easterlin (1995), Frey and Stutzer (2002)], the sharp increase in the surface of newly constructed houses in the United States, the labour force participation of married women [Neumark and Postlewaite (1998)], and the demand for luxury goods [Frank (1999)]. The application of positional theory in Finance, which is the closest to the topic of this paper, is the competition for talented agents, especially for CEOs or traders in the finance sector [see e.g. Gabaix and Landier (2008), Thanassoulis (2012)]. Indeed, the fact that investors look for talented fund managers might explain the incentive for positioning introduced in the contracts for management fees, as well as the race of fund managers to be well ranked.

The aim of this paper is to introduce the positional concern in portfolio management.

The positional portfolio management is based on the maximization of the expected utility of the rank (or position) of the portfolio value, as opposed to the traditional portfolio management which focuses on the expected utility of the portfolio value itself. The positional portfolio management leads to new types of allocations strategies, which we compare theoretically and empirically with traditional allocation strategies, such as mean-variance, momentum and contrarian (or reversal) strategies, as well as the naive $1/n$ portfolio. We measure the ability of positional strategies to yield portfolio returns that rank well cross-sectionally. A positional strategy diverts resources to be well ranked in the race among portfolio managers and might diminish the absolute performance compared to nonpositional strategies. Therefore, one goal of our analysis is to measure the loss of absolute performance due to a positional strategy.

In Section 2, we introduce the notion of cross-sectional rank (position). This notion is used to define a positional portfolio management, and is at the core of the distinction of this management from the standard management based on the expected utility of future portfolio returns. A positional strategy can be interpreted as a standard strategy in which the utility function is replaced by a stochastic utility, which is function of the stochastic cross-sectional distribution of returns. To implement the positional portfolio strategy we need an appropriate specification which disentangles the rank dynamics and the dynamic of the cross-sectional distribution of returns. The model for the dynamic of ranks is introduced in Section 3. The Gaussian ranks follow a conditionally Gaussian autoregressive process, with the autoregressive coefficient accounting for positional persistence. The latter can depend on unobservable individual heterogeneities and stochastic dynamic factors. The dynamic model for the ranks is used in Section 4 to construct a first type of positional portfolio allocation strategies, which are compared with standard momentum and reversal strategies on a large panel of returns for stocks traded in the NYSE, AMEX and NASDAQ markets. The investment universe for these positional strategies consists of about 1000 stocks, which illustrates the big data aspect of our analysis. In Section 5 we complete the model by introducing an appropriate specification for the dynamic of the cross-sectional distribution of individual stock returns. The distribution is chosen in the Variance-Gamma family, with stochastic mean, variance, skewness and kurtosis driven by unobservable common factors, in order to accommodate time-varying higher-order moments of the cross-sectional returns distribution. The full vector of macro-factors driving positional persistence and the moments of the cross-sectional distribution follows a vector autoregressive (VAR) process. The specifications for the dynamics of positions, cross-sectional distribution and underlying factors define the joint dynamics of returns. This complete dynamic model is used in Section 6 to construct efficient positional portfolio allocation strategies. We compare the performance of the momentum and efficient positional strategies with the performance of traditional mean-variance, minimum-variance and $1/n$ strategies. Section 7 concludes. Technical proofs are gathered in Appendices.

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