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On the usefulness of the contrarian strategy across national stock markets: A grid bootstrap analysis☆

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ABSTRACT

This paper statistically evaluates the usefulness of the contrarian investment strategy across the national stock markets of 18 developed countries. The contrarian strategy implicitly assumes that asset prices tend toward a fundamental value path over time. Conventional bootstrap analyses and panel unit root tests are often consistent with such a hypothesis. However, these results might be contaminated by small-sample bias and/or by not controlling cross-section dependence. Correcting for small-sample bias nonparametrically, I find extremely slow mean reversion rates, which provide strong evidence against the usefulness of the contrarian strategy.

1. Introduction

One implicit assumption of the contrarian investment strategy (DeBondt and Thaler, 1985) is the mean reversion property of asset prices toward a fundamental value path. That is, when asset prices are mean-reverting, one may obtain excess returns by short-selling assets that have performed well and buying assets with relatively poor past performance.

Empirical evidence on mean reversion in US stock prices is mixed. Fama and French (1988) found significantly negative autocorrelation coefficients for long-horizon real US stock returns. Poterba and Summers (1988) found that a substantial part of the variance of the US stock returns is due to a transitory component. Many other researchers, however, question the validity of the mean reversion hypothesis. Kim et al. (1991) report very weak evidence of mean reversion in the post-war era. Richardson and Stock (1989) and Richardson (1993) point out that the previous empirical evidence in favor of mean reversion might be spurious, with the results caused by not controlling for small-sample bias. McQueen (1992) also shows that mean reversion results are not robust to distributional assumptions.

An array of researchers has also investigated mean reversion in the context of the international stock markets, again producing mixed evidence of mean reversion. Kasa (1992) argues that national stock indices for 5 industrialized countries are cointegrated around a common world component, which implies short-lived excess returns for these countries. Richards (1995), however, finds no evidence of cointegration using stock index data for 16 OECD countries.[1] Balvers et al. (2000) implemented a Levin et al. (2002) type panel unit root test for 18 countries with well-developed stock markets, and reported strong evidence in favor of mean reversion. More recently, Bhojraj and Swaminathan (2006) found some evidence in favor of the long-run contrarian strategy using stock index data for 38 countries that included both developed and less developed economies.

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[1] Notwithstanding such results, he provided some evidence for predictability of stock returns relative to a world index from the same data set.

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Given such mixed evidence, I attempt here to shift the focus from the mean reversion tests to a more practical issue. That is, this paper statistically evaluates the usefulness of the contrarian investment strategy using a nonparametric grid bootstrap analysis. I am especially interested in measuring how fast stock price deviations from fundamental value disappear, because findings of persistent deviations would imply that the practical usefulness of the contrarian strategy is limited.

Assuming that convergence rates are the same for all countries, Balvers et al. (2000) report 3 to 3 and half year half-life estimates for deviations after correcting for median-bias by Andrews' (1993) method.[2] They also reported very compact confidence intervals that range around 2 to 5 years.

Their results, however, are subject to potentially serious problems. First, they assume that deviations from fundamentals are caused solely by idiosyncratic shocks. Put it differently, they employ an assumption of cross-section independence in estimating half-lives of stock price deviations, which can be too strong in empirical work dealing with macroeconomic panels. Recently, new panel unit root tests that utilize common factor structures to take into account of the cross-section dependence have been put forward, among others, Pesaran (2007), Bai and Ng (2004), Moon and Perron (2004), and Phillips and Sul (2003). One related finding is that panel unit root tests with *no* cross-section dependence consideration suffer from serious size distortion (Phillips and Sul 2003), which casts doubt on the results of Balvers et al. (2000).

Second, they neglect the fact that the median-bias is *random* in the presence of nuisance parameters. When one is dealing with higher order autoregressive, AR(p), processes, the median-bias should be estimated for each realization of other coefficients (nuisance parameters).[3] Using bias estimates from an AR(1) specification, therefore, yields inaccurate correction.[4]

In this paper, I employ Hansen's (1999) grid bootstrap technique for bias-correction in higher order AR processes. His method does not require any distributional assumption such as Gaussianity, but provides excellent first-order asymptotic coverage properties.[5] For panel Seemingly Unrelated Regression (SUR) estimation following Balvers et al. (2000), I relax the assumption of cross-section independence as I find strong evidence of cross-section dependence.

Using the Morgan Stanley Capital International (MSCI) stock index data for 18 developed countries from December of 1969 to September of 2007, I estimate half-lives of national stock price deviations from fundamental values in univariate and in panel regression models. From univariate regressions, I obtain a 3- to 4-year median half-life estimate with the conventional bootstrap confidence intervals ranging around 1 to 8 years. When I nonparametrically correct for small-sample bias, however, some of the half-life point estimates become infinity. More surprisingly, I find finite confidence intervals for only a few countries. This result seriously casts doubt on the usefulness of the contrarian investment strategy, because an experiment that demonstrates the contrarian strategy outperforms others might be a singular event. When I implement panel-SUR estimations with cross-section dependence consideration, I find much longer half-life estimates compared with those of Balvers et al. (2000) especially when the US serves as a reference country. This again provides strong empirical evidence against the use of the contrarian strategy.

The remainder of the paper is organized as follows. In Section 2, I describe my estimation models of asset prices. Section 3 discusses the bias-correction methods for point estimates and confidence intervals based on Hansen's (1999) work. Section 4 describes the data and provides some preliminary statistics. In Section 5, I report my empirical findings. Section 6 concludes.

2. The econometric model

2.1. Univariate estimation

I start with a model of a stochastic process for national stock indices that is similar to the one by Balvers et al. (2000).

Let p_t^i and f_t^i be the log of the stock index and the log of its fundamental value for country i, respectively. When p_t^i is mean-reverting around f_t^i, its deviation should die out eventually, which implies the following error correction model.[6]

$$\Delta\left(p_{t+1}^i - f_{t+1}^i\right) = a^i - \lambda^i\left(p_t^i - f_t^i\right) + \varepsilon_{t+1}^i, \tag{1}$$

where $0<\lambda^i<1$ and ε_t^i is a mean-zero serially uncorrelated stochastic process from an *unknown* distribution. That is, the deviation of the country i's stock index away from its fundamental value, $p_t^i - f_t^i$, converges to its long-run equilibrium with the country-specific convergence rate λ^i.

It is interesting to compare our model (1) with the one by Balvers et al. (2000). They claim that the stochastic process of a mean-reverting (weakly stationary) asset price can be represented as,

$$\Delta p_{t+1}^i = a^i - \lambda^i\left(p_t^i - f_{t+1}^i\right) + \varepsilon_{t+1}^i, \tag{2}$$

which is motivated by forecasting models of stock returns (see, for example, Cochrane, 2008).[7] Unlike our error correction model, this equation does not require any cointegrating relation. However, it is hard to interpret the

[2] The term “half-life” refers to the time period sufficient for the deviations to decay to one-half.
[3] Bias-correction methods proposed by Andrews and Chen (1994) or Hansen (1999) are applicable to AR(p) processes.
[4] See their appendix (pp.769–770) for details.
[5] If we assume that errors are i.i.d. Gaussian, Hansen's method coincides with the method by Andrews and Chen (1994).
[6] If p_t^i and f_t^i are integrated processes, this assumption implicitly means that they are cointegrated with a known cointegrating vector [1 − 1].
[7] See their Eq. (1) on p.748.