

# Capital Gains Overhang with a Dynamic Reference Point

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## Abstract

**Abstract:** Can financial models that rely on a fixed reference point be enhanced by incorporating reference point adjustment over time? Using experimental methods, this paper generates an equation for the likely reference point based on key points from the share price path. The purchase, maximum, minimum and final prices are found to be key determinants of the reference point. Market data testing is then undertaken to establish the predictive power of the result. Specifically, the Capital Gains Overhang (CGO) variable from Grinblatt and Han (2005) is adjusted for the likely reference point, based on a combination of determinants established in the experiment. The adjusted CGO measure outperforms the unadjusted version, in cross-sectional US equity return analysis and performance analysis of decile sorted portfolios.

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## Extended Abstract

The key contribution of this paper is to show the benefits of more fully reflecting the process of reference point adjustment over time in financial models; specifically the Capital Gains Overhang (CGO) model developed by Grinblatt and Han (2005). Grinblatt and Han (2005) showed that CGO is a key variable that generates the underlying profitability of a momentum strategy. This paper demonstrates that the CGO measure can be enhanced, through relaxation of the fixed reference point assumption, to form a new adjusted-CGO measure that outperforms the traditional variable in cross-sectional regressions of US equity returns and in back-tested decile portfolio performance tests.

The role of the reference point, a central feature of Prospect Theory (Kahneman and Tversky, 1979), has received less attention than other parts of the theory. More attention has been paid to the differing shape of the Prospect Theory curve when in a position of gain or loss, which can lead to a disposition effect (Shefrin and Statman, 1985), as investors become risk averse in gains and risk seeking in losses. A key motivating aim of this paper is to place the spotlight back on the role of the reference point and use market data to quantify the improvement that this can bring, using the CGO, which is a highly cited and well known financial measure.

An experiment is first undertaken, building on the work of Baucells et al. (2011), to establish the role of intermediate prices, in addition to the purchase price and final price, in reference point formation. This is conducted by showing participants a series of share price graphs and asking them for the price at which they feel neither predominantly positive nor negative about selling. This point of indifference, or reference point, is then regressed against other points in the share price chart such as the purchase, maximum, minimum and average price to assess

their importance in the determination of the reference point. The results suggest that intermediate highs and lows are important points in reference point formation, in addition to the purchase and final prices.

The experimental results suggest that the CGO measure can be adapted to consider salient highs and lows in addition to the purchase price. The next section of the paper, using market data, looks to test the explanatory power of these alternative CGO measures that use a mix of purchase, maximum and minimum points, with weights based on the earlier experimental results.

Regression analysis is undertaken on US equity returns using the traditional CGO variable, various adjusted CGO variables and a set of control variables originally used in Grinblatt and Han (2005). While the traditional CGO variable is found to be a more important predictor of one month ahead returns than traditional price momentum, as defined in Jegadeesh and Titman (1993), it is also found to be insignificant once the alternative CGO measures are included in the regression. The alternative CGO measures also outperform the purchase price based CGO in decile sorted portfolios returns. The use of dual methods, both experimental and market data analysis, demonstrates the reality of reference point adjustment across both frameworks and establishes the external validity of the result.

The results suggest that investors take multiple points into consideration when forming a reference point. Chief among these are the purchase price and intermediate points of interest such as recent highs and lows. Financial models that rely on a purchase price based reference point may be improved by considering reference point adjustment over time.

## References

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