



Implementing ESG tilts in an Equity Portfolio

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Executive summary

In this paper we investigate the impact of Environmental, Social and Governance (ESG) enhancements to an Australian equity investment strategy over the course of an economic cycle. The study has three unique features that add new perspectives to understanding the interaction between ESG exposures and investment outcomes. Firstly, in an area where historical data is generally limited in timeframe and narrow in stock coverage, the ESG data analysed in this paper spans almost a decade, covers large, mid and small cap companies, and includes both bull and bear markets. Secondly, the study provides an important reference point by realistically simulating ESG strategies similar to investment options currently being considered by the investment management industry. Lastly, we look beyond the simple choice of whether or not to introduce ESG into an investment strategy and we investigate the impact that different levels of 'ESG strength' have on returns.

This study provides important insights for asset owners, asset consultants and trustees. ESG enabled strategies are evaluated in terms of returns, risks, turnover and tracking error. Quantitative analysis provides much needed empirical input into decisions such as "how 'strongly' should an ESG strategy be implemented?"

We find that most ESG enhanced strategies generally outperformed in the down market of 2008, but over the duration of a full business cycle stronger ESG tilts were associated with underperformance, particularly if the strategy was implemented naively.

We find that by adopting a well thought out and pragmatic approach it is possible to add modest value in most market conditions by adding a small amount of ESG exposure to a portfolio. In contrast, we find that making the ESG enhancement too large can detract value whilst simultaneously increasing tracking error and turnover.

The case for Environmental, Social and Governance (ESG) investing

Environmental awareness and the impact of environmental issues upon corporate profitability has increasingly become a key focus for investors as well as governments and corporations. For example, in Australia, the Federal Government has passed legislation in the lower house to introduce a carbon tax as a prelude to an emissions trading scheme which will fundamentally change the economics of carbon emission and hence impact corporate profitability and the costs of goods and services.

A significant body of anecdotal evidence appears to validate the case for ESG investing. Such anecdotal evidence is supported by credible theories as to why we can expect an ESG strategy to outperform.

The theories linking a company's ESG scores and investment returns are:

(E) Environmental – the conservation of resources is synonymous with efficiency, and bad environmental policies carry a risk of expensive liability¹.

(S) Social - positive social practices are rewarded with improved worker productivity and enhanced community relations, whilst negative practices may lead to brand damage, litigation and industrial action.

(G) Governance – Good corporate governance aligns the interests of management, shareholders and customers, whilst bad governance may lead to management's actions being detrimental to other stakeholders.

However convincing the anecdotal evidence is, and however sound the theories seem, the case is still only a circumstantial case without a greater body of empirical evidence. An institutional investor holds a broad collection of stocks for long periods of time. So what happens to returns in the periods where ESG risks are not realised?

In this paper we simulate ESG enabled investment portfolios and generate empirical results that can be used to assess these ESG theories and also help determine what trade-offs are made in choosing to follow an ESG strategy.

¹ Eg, BP Gulf of Mexico Deepwater Horizon Spill required the establishment of a \$20 billion compensation fund; Orica – Botany Bay chemical pollution clean-up; Santos – Mud flow from drilling operations in Indonesia.

Environmental, Social and Governance investing

There is increasing investor preference to invest in ESG aware investment strategies. This is evident in the rapid growth of UNPRI signatories² as well by the increased focus on ESG practices and policies from asset owners and asset consultants. Demand for ESG solutions continues to grow. As the availability and understanding of ESG data increases, the investment community has developed increasingly sophisticated ESG strategies. In addition to negative screening of companies that are poorly ranked on ESG criteria, positive screening of highly ranked companies can be used to increase exposure to sustainability themes. There are also middle ground approaches which are less absolute in their application. For example, 'best in sector' screens help to maintain adequate sector diversification whilst favouring better scoring companies within each sector. Another middle ground approach is tilting a portfolio towards ESG factors which we will explain in more detail later.

The increasing availability of independent ESG data sources and more thoughtful ESG research has started to uncover some positive relationships between ESG exposures and investment outcomes. In addition, generally positive ESG performance during the Global Financial Crisis has highlighted potential benefits such as capital protection during extreme market conditions.

Underlying any investment process is the concept of receiving an adequate return for the provision of investment capital. It would be ideal if good ESG behaviour also resulted in good investment performance most of the time. However, what should be done if this is not the case? After all, the purpose of investing in the first place is to seek an adequate investment return.

In addition to satisfying demand for ESG strategies, investment managers and fund trustees have a fiduciary duty to their investors/members. Legal and regulatory obligations may limit the choices available for certain types of investor. Trustees of regulated superannuation funds in Australia have an obligation to provide benefits to each member on or after their retirement. For trustees, anecdotal confirmation of the ESG value proposition is unlikely to be compelling without supporting data that validates any particular strategy or approach.

With this as a backdrop, let us now consider some ESG enabled investment strategies and subject them to the rigorous evaluation techniques that quantitative researchers excel at.

² As at Aug 14, 2011 there are 237 Asset owners and 527 investment manager signatories to the United Nations Principles for Responsible Investment.

ESG investment strategies

We present three different ESG investment strategies, and discuss the advantages and disadvantages of each approach.

Each test demonstrates the impact of the compromise between maximising ESG exposures and maximising returns. We have conducted portfolio simulations using historical share market data and third-party ESG scores³ to simulate what would have happened to investment portfolios that are very similar to other Australian equities funds. The three strategies are as follows:

Strategy 1. Negative screen

Maximising ESG exposure by screening out the lowest ranking ESG companies. This represents a strong form of ethical investing, where any company below a certain score is eliminated from the investment universe. The surviving companies are then 'optimised' to create a portfolio that minimises tracking error relative to a regular benchmark.

Strategy 2. ESG tilted index tracker

An ESG tilt is introduced whilst minimising benchmark deviation. This represents an investor who seeks performance as close as possible to index returns, whilst also incorporating a tilt towards high score ESG companies and away from low score ESG companies. This approach seeks to construct a portfolio with similar characteristics to the benchmark, whilst allowing for specific names to be held at different weights, trading off ESG exposure with benchmark risk.

Strategy 3. Maximising returns with an ESG tilt

The main objective of maximising returns is tested whilst applying an ESG tilt. This represents an investor who wishes to maximise investment returns, but also wants to satisfy an ESG preference. Stocks are selected based on Plato's proprietary alpha model⁴ and an ESG tilt is overlaid. In this strategy ESG exposures are designed to be superior to the index, but investment return remains the primary objective.

All strategy simulations run from October 2001 until December 2010 as this is the period covered by the ESG data vendor. The major benefit of using this particular ESG dataset is the length and breadth of the data series for all ESG components which enables us to observe the interaction between ESG scores and investment portfolios across a complete market cycle.

³ CAER Corporate Monitor ESG scores were selected based on the length (Sept-2001 start date) and breadth of Australian market coverage, as well as having scores for "E", "S" and "G" categories.

⁴ Plato alpha model incorporates value, quality, earnings growth and momentum factors

Strategy 1. Negative screen

An average ESG score was calculated using vendor data with equal weight given to each category (i.e. E, S and G). Each category has a value from lowest [1] to highest [5]. A neutral ESG score is [3]. A portfolio simulation was run that targeted tracking the benchmark as closely as possible after screening out the lowest ranking ESG stocks. The simulation utilised Barra mean-variance optimisation and the Barra Australian long term risk model, benchmarked to the S&P/ASX 200 index. With this methodology, the optimisation will not simply pro-rata the weights amongst the remaining stocks, but will also seek the optimal solution for replicating the characteristics of the index by intelligently re-weighting the un-screened stocks to compensate for stocks screened out of the investment universe. The test was then repeated by screening out the next lowest ESG scoring names in addition to the lowest, and so on until all stocks without a positive average score were screened out. The portfolio was rebalanced monthly with realistic assumptions regarding transaction costs and market liquidity. The resulting portfolio simulations were then passed through a Barra performance attribution system to produce a detailed analysis of the strategies. The results are shown in the charts over-page and key observations are highlighted below.

Key observations

- During bull markets, most negative screen strategies under perform.
- Tracking error increases rapidly as more stocks are screened out.
- Total risk increases as the list of excluded names expands and portfolio concentration increases.
- Active returns are unstable at different cut-off levels, indicating random outcomes.
- Without a process to align non-screened investments with good scores, the strategy does not fully benefit from periods where positive ESG exposures should add value such as 2008.

It is worth noting that in practice, few managers would screen out all names below a hard cut-off value. This test highlights that the impact of a strict implementation of a score-based screen is unlikely to result in acceptable investment outcomes.

Results: Strategy 1 – Negative Screen

Chart 1A – Information Ratio

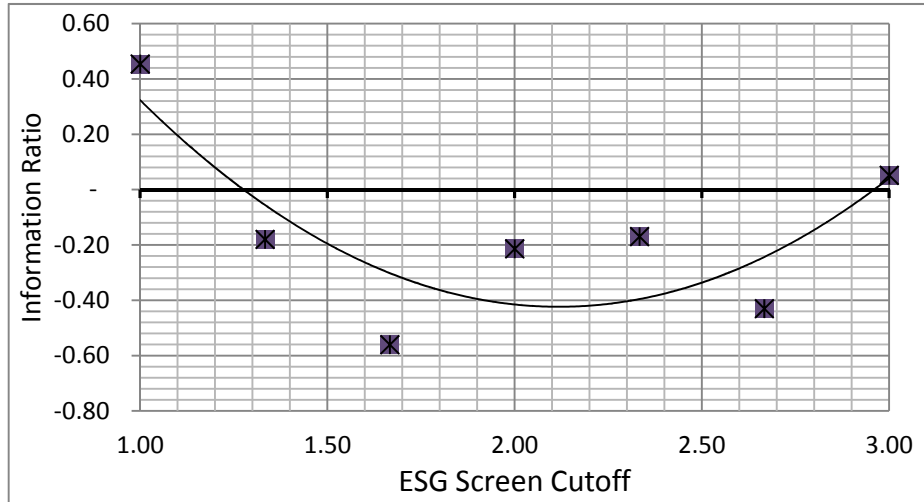


Chart 1B – Tracking Error

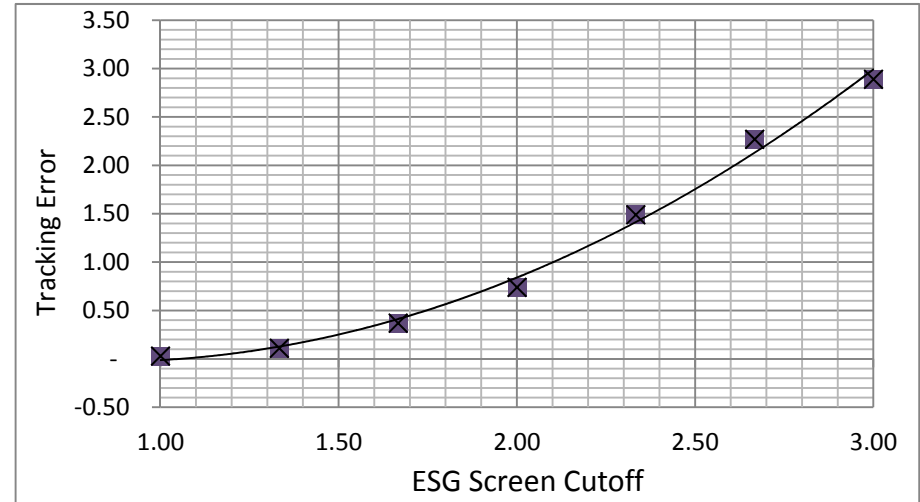


Chart 1C – Calendar Year Active Return by ESG Cut-off Level

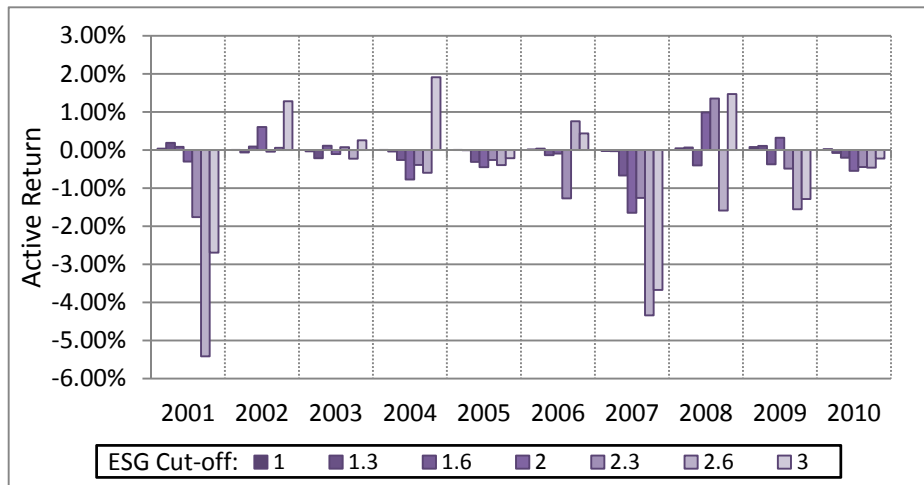
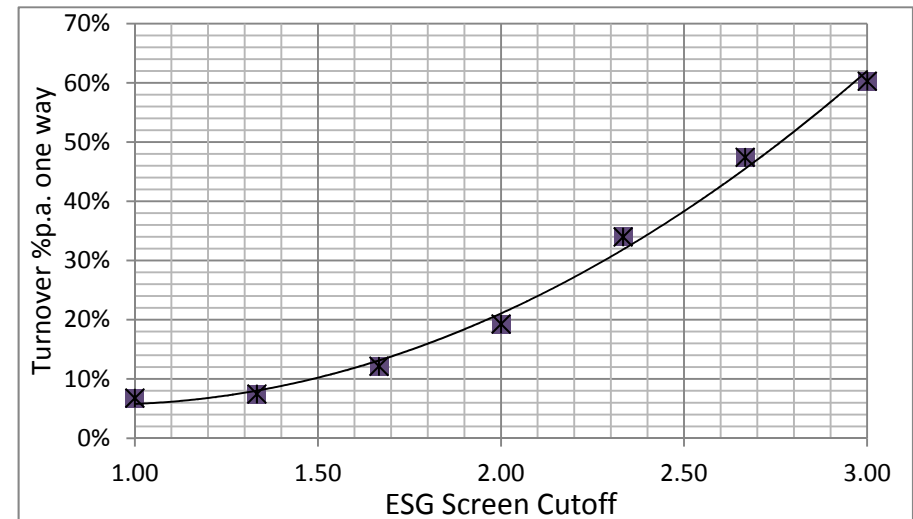


Chart 1D – Monthly Active Return vs ASX200 (ESG Screen 2.0)



Strategy 2. ESG tilted index tracker

In this strategy, a uniform ESG tilt is introduced whilst minimising benchmark deviation. Portfolios are constructed to have tight index tracking and hence are close to sector neutral. This has the advantage of minimising macro risks since trade-offs can be made between stocks within a sector without overweighting or underweighting the entire sector due to industry-based skews in ESG scores. Effectively this shifts the ESG trade-off away from screening out entire segments of the market and instead focuses on differentiating between like companies based on their ESG scores. An advantage of this strategy is also that it provides an incentive for companies in industries that rank poorly on an ESG basis to try to do better since they are compared to their peers, not the entire investment universe. Another benefit relative to negative screening is that large companies that score poorly do not have to be eliminated entirely, but instead may be down weighted. This compromise reduces the impact of ESG preferences on the investment outcome, yet still sends a signal that poor ESG behaviour by a corporate will impact investor support.

Under this scenario, if superior peer-relative ESG scores are rewarded with investment outperformance, you would expect this strategy to match or outperform the index after transaction costs. Results are shown in the charts over-page.

Key observations

- Positive ESG tilts produced consistent out-performance in the falling market of 2008.
- Most strategies underperform the benchmark post transaction costs over longer horizons.
- Performance tracks the index much more closely than the negative screening strategy.
- The strategy can achieve a smooth range of ESG exposures relative to tracking error.
- Total portfolio risk is marginally reduced, supporting the theory that positive ESG exposure reduces market risk.
- As the ESG tilt is increased, a tipping point is reached where total risk begins to rise again, likely due to portfolio concentration beginning to outweigh the risk reduction gained through ESG exposure.
- A tilt delivers a more stable investment outcome compared to a negative screen in that it achieves lower portfolio total risk, lower turnover, and more stable investment performance.

Results: Strategy 2 – ESG Tilted Index Tracker

Chart 2A – Information Ratios

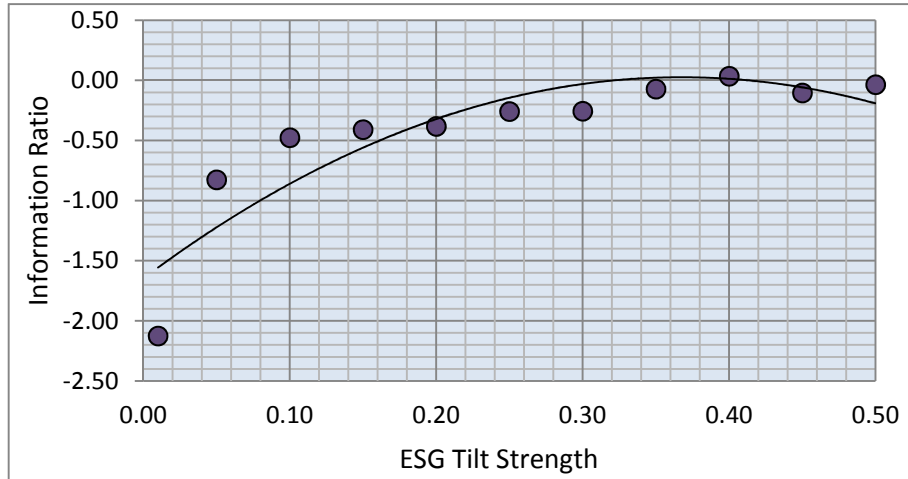


Chart 2B – Tracking Error

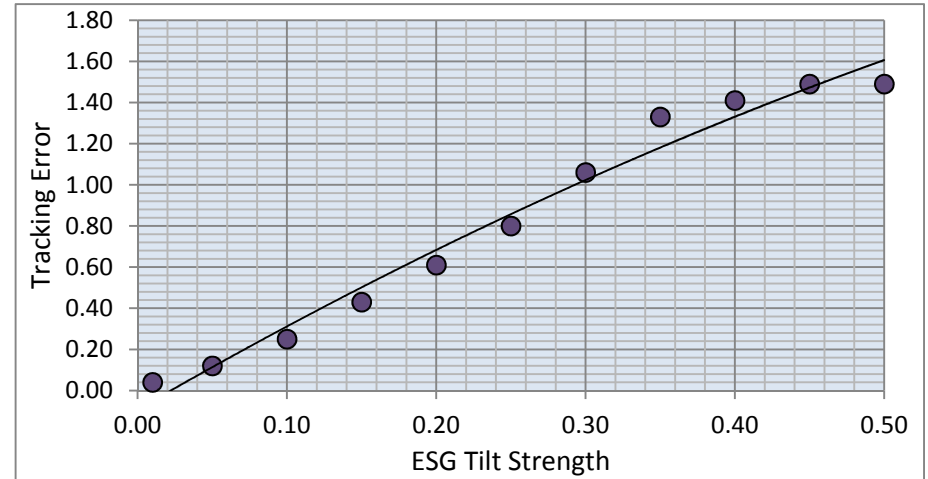


Chart 2C – Calendar Year Active Return by ESG Tilt Level

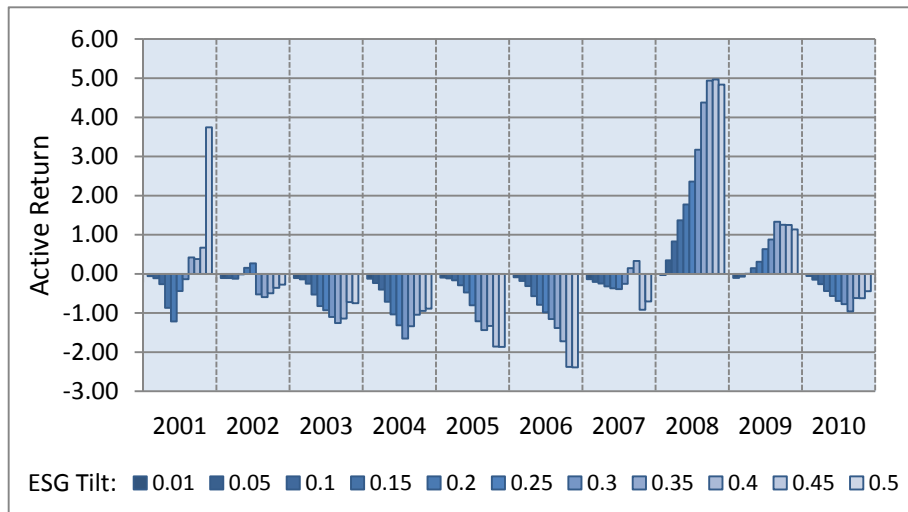
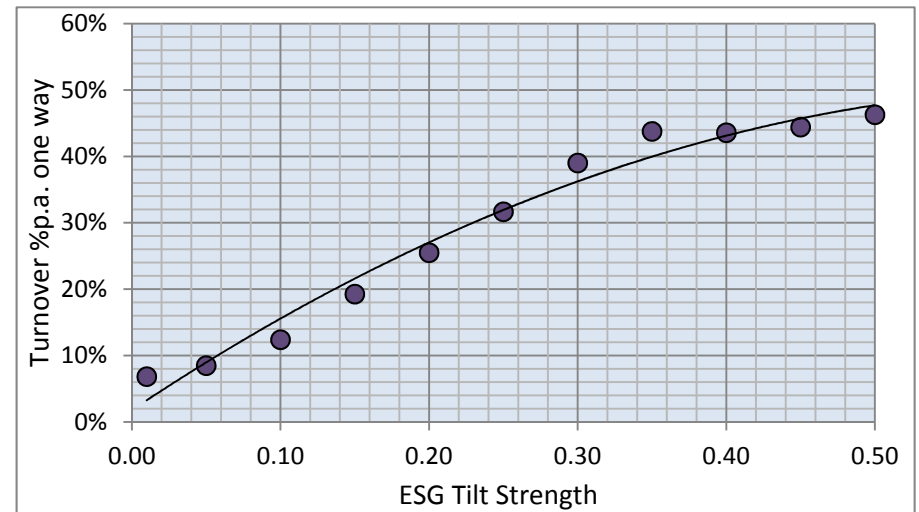


Chart 2D – Turnover



Strategy 3. Maximising returns with a secondary ESG objective (Pragmatic ESG strategy)

In this test the primary objective is on maximising returns and a secondary objective is ESG satisfaction. To do this we created a pragmatic ESG score which tilts towards the E, S and G scores only in market segments where the *materiality of the exposure* is significant and hence relevant, and the *expected return from a tilt is positive*⁵. In this strategy, the ESG approach moves from the more thematic end of the ESG investment spectrum towards a more pragmatic strategy consistent with a typical core portfolio approach. Even still, the question must be asked, how much ESG should I add before my ESG objective starts to harm my return objective? We know from a significant body of evidence that valuation and growth stock-selection models have, over longer time horizons, performed quite well. In contrast, the predictive power of ESG scores (based on current data, at least) is mixed, and even the best ESG factors have lower share price forecasting power than typical value or growth factors. To determine the point where ESG value-add tapers off, we ran tests that gradually increase the size of the ESG tilt to see where the maximum benefit if any was delivered.

In this test, if a low ESG score reduces the investment weight in a stock that has a high expected return, this is compensated for by increasing the weight in another stock that has both a high ESG score as well as a high expected return, and vice versa.

To test the robustness of this approach, we tested an Enhanced Index strategy that tracks the benchmark reasonably tightly at around 1% tracking error, a more concentrated 2% tracking error Core strategy, and a short enabled 130/30 strategy with 4% tracking error. All investment strategies utilise the same alpha model for forecast stock returns and apply standard portfolio construction rules.

Key observations

- A pragmatic ESG tilt at lower strengths can add to returns in most years.
- The value add of the ESG tilt has an upper limit, beyond which further ESG exposure begins to detract from returns and increase tracking error. This makes sense as there is a point beyond which trade-offs can no longer be made without penalising the portfolio's return target.
- The value added to the low risk (enhanced) strategy tapers off more quickly than for a higher risk strategy. This is due to tighter portfolio construction rules and fewer 'degrees of freedom' in satisfying the dual investment objectives, compared to the looser constraints applied in the higher risk portfolios.
- The value-add from ESG tilting was greatest in the down market of 2008, which is consistent with the findings of Strategy 2.
- ESG value added was less evident for the concentrated portfolio, possibly due to idiosyncratic factors affecting the outcome.
- Total portfolio risk is decreased with stronger ESG tilts, however it is at the cost of both higher tracking error and lower returns.

⁵ Plato customised ESG score based on CAER Corporate Monitor underlying E, S and G scores.

Results: Strategy 3 – Pragmatic ESG

Chart 3A – Information Ratios

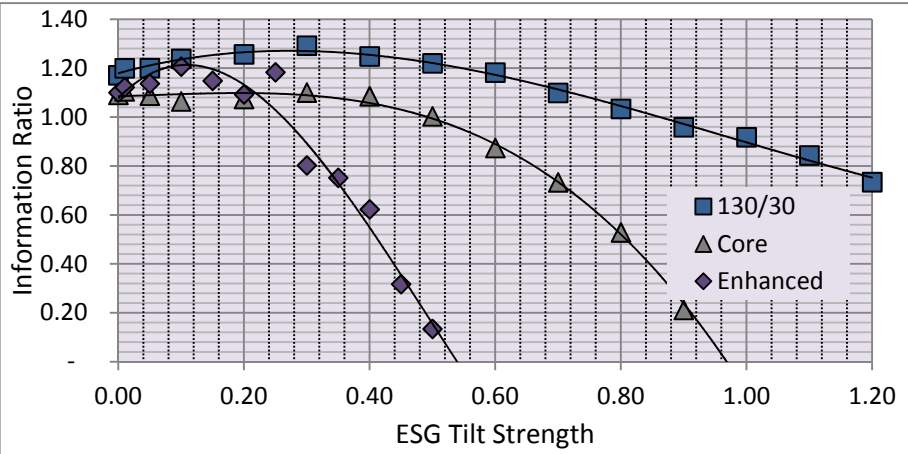


Chart 3B – Tracking Error

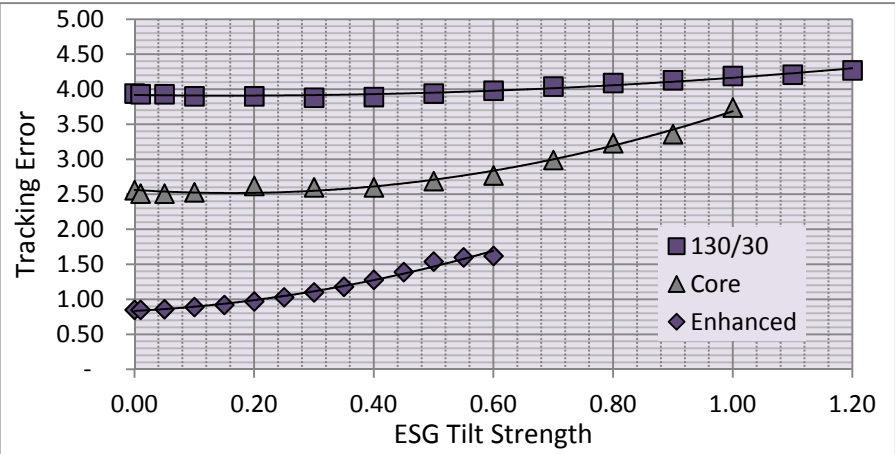


Chart 3C – Calendar Year Active Return by ESG Tilt Level - Enhanced

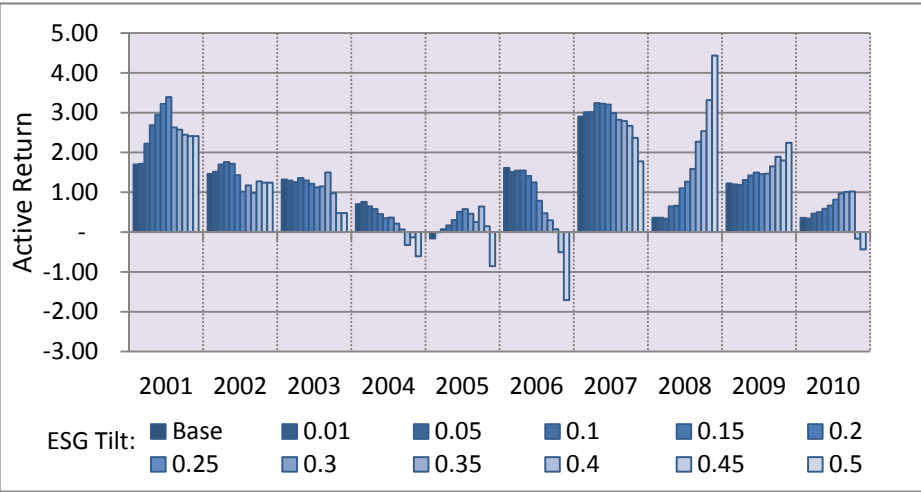
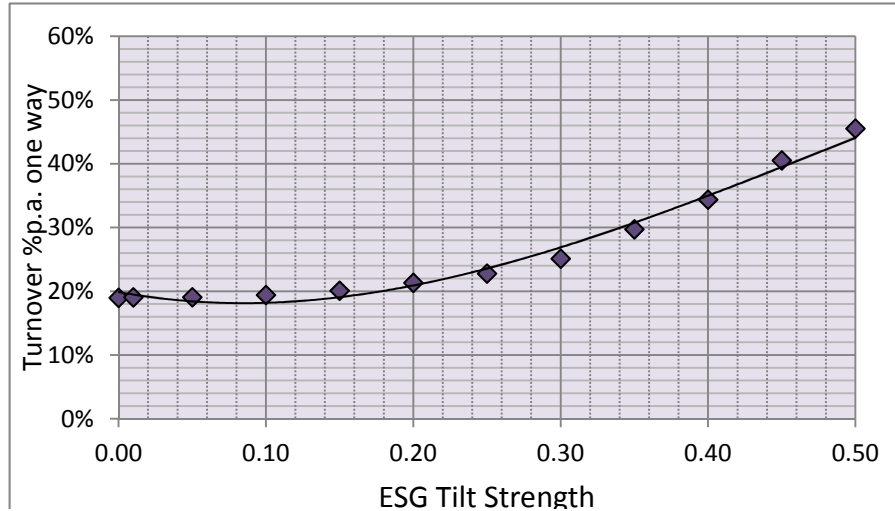


Chart 3D – Turnover - Enhanced



Conclusion

ESG investment research is rapidly moving into mainstream investment management. However the industry's understanding of the way in which ESG scores and investment outcomes interact is still developing. Over time the increasing volume and quality of data will permit more detailed research and hence assist our understanding of the impacts of ESG investing. The Global Financial Crisis demonstrated that a positive ESG exposure could add value in the down phase of the market. However the tests documented in this paper demonstrate that the potential value-add captured in ESG data may not be capitalised upon if a naïve negative screen is employed. Simply eliminating the poorest scoring names does not necessarily produce an ESG enhanced portfolio if the surviving names are not subject to some alignment with ESG scores.

We find that a strategy of naively tilting towards positive ESG scores for the entire investment universe has some positive and some negative impacts. On the positive side, total portfolio risk tends to decrease, and active performance is quite good in down markets. This is very useful as the strategy helps preserve capital at a time when it is most at risk. On the negative side we find that tracking error and turnover increases, and inferior investment returns are delivered in most years outside of bear markets. The effect increases as the strength of the tilt is increased. If we compromise on the strength of the tilt and apply a smaller amount of ESG exposure then it is possible to build a strategy that tracks the index reasonably well at the cost of only a small loss of expected return in up-markets. Further compromises are likely to improve the result, such as only applying ESG criteria in areas where ESG exposures are considered to be material and where there is a reasonable expectation that the market segment where the ESG tilt is applied has a positive return.

When applying the full range of best ideas in a “pragmatic ESG approach”, we find that the investment outcomes are modestly enhanced in most years, across both up and down markets. This involves making compromises in tilt strength (a little bit of ESG, but not too much), and adjusting the ESG investment process to account for issues such as materiality, risks and expected returns. The value add disappears when the ESG tilt is increased beyond a critical threshold, and becomes a headwind for investment returns as the ESG tilt displaces the alpha model in determining stock weights.

Given that the long-term benefits to a company of positive ESG policies are less tangible than short-term profit updates, and downside event risk occurs at infrequent intervals, there is a mismatch between the investment horizons of most investors and the pay-off period for a positive ESG exposure. With this in mind as well as the results of the tests on three different ESG investment strategies, we conclude that the best way of maximising returns within the context of an ESG aware portfolio is to apply ESG criteria selectively, and at low to modest strength.

About the Author – Todd Kennedy

Todd is Senior Portfolio Manager at Plato with primary responsibility for driving research into quantitative stock selection models, alpha generation, portfolio construction and ESG. Todd has 19 years financial market experience, and prior to Plato was Head of Asia ex Japan Active Equities for State Street Global Advisors (SSGA). At SSGA Todd led an investment team of seven that managed aggregate AUM of up to \$8 billion. Prior to SSGA, Todd worked at Barra as a client support consultant. His role at BARRA required detailed knowledge of the quantitative systems developed by Barra, and included optimisation and portfolio construction, quantitative risk analysis and decomposition, performance attribution and helping clients develop alpha generation models.

Prior to BARRA Todd was Head of Equity Derivative Research Asia Pacific ex Japan at Merrill Lynch, producing research and providing quantitative support for global sales, trading and proprietary desks. Todd has also held positions at the Sydney Futures Exchange, the Australian Stock Exchange (ASX) and Ord Minnett.

Todd has a Bachelor of Science (Griffith University), Graduate Diploma of Applied Finance (SIA) and a Master of Applied Finance (Macquarie) where he presented his thesis for prediction of futures markets movements with an artificial intelligence expert system.

About Plato Investment Management

Plato Investment Management Limited is a boutique quantitative equities manager that is majority owned by its directors and staff, with minority ownership and support provided by Pinnacle Investment Management. Plato's five-strong quantitative investment team has over 65 years of collective experience. Plato applies a disciplined and active quantitative investment management approach to Australian share management.

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