

The Viability of Using ESG Equity Index Futures in Graham's Systematic Strategies

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Abstract

This paper surveys the nascent but fast-growing universe of ESG equity index futures by contract, volume, and open interest. We estimate the tradeable portfolio size, replacing standard equity index futures with ESG index futures in our core trend-following strategies. We find that, in simulation, such a substitution would not be to the detriment of the portfolio overall.

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1. Introduction

CTAs and systematic macro funds focus on trading commodities, foreign exchange, government bonds and rates, and equity indices. It is simple to make such portfolios ESG compliant in the former three asset classes by excluding countries (for fixed income and FX) and commodities that are not deemed ESG compliant. Things get more difficult for the equity component, however.

It is straightforward for portfolios containing single name equities and bonds to be made ESG compliant by excluding the single names that appear on an agreed ESG screen list. However, for portfolios that focus on equity indices, the only workable option (beyond outright exclusion) is to trade instruments based around ESG screened equity indices, for which markets are still somewhat underdeveloped.

In this paper, we examine the still-nascent universe of ESG screened equity index futures and assess the viability of these instruments as replacements for broad equity index futures in trend-following and systematic macro portfolios. We consider these markets' liquidity, tradability, and profitability compared to the 'standard' equity index futures currently traded and estimate whether these are presently viable as replacements.

2. The Universe of ESG Compliant Equity Index Futures

We surveyed the futures universe for ESG equity index futures, as presented in Table 1¹. Many of the above contracts have short histories and lack continuous volume and open interest data. However, for those contracts where it is possible to extract consistent data, we present the estimated results in Table 2.

Furthermore, we have performed a comparison to the corresponding 'standard' (i.e., non-ESG) contracts in Table 3. In all cases analyzed, the total USD volume and USD open interest across the ESG contracts in a given region is less than 1% of the corresponding standard contract.

However, on the positive side, we note that the volumes and open interest in ESG futures are increasing at pace, as can be

CONTRACT	EXCHANGE
E-MINI S&P500 ESG	CME
EUROSTOXX 50 ESG	EUREX
EUROSTOXX 50 LOW CARBON	EUREX
MSCI EAFE ESG SCREENED	EUREX
MSCI EM ESG SCREENED	EUREX
MSCI JAPAN ESG SCREENED	EUREX
MSCI USA ESG SCREENED	EUREX
MSCI WORLD ESG SCREENED	EUREX
STOXX 600 ESG-X	EUREX
STOXX EUROPE CLIMATE IMPACT	EUREX
STOXX EUROPE ESG LEADERS SELECT	EUREX
STOXX USA 50	EUREX
MSCI EAFE ESG LEADERS	ICE
MSCI EM ESG LEADERS	ICE
MSCI EUROPE ESG LEADERS	ICE
MSCI USA CLIMATE CHANGE	ICE
MSCI USA ESG LEADERS	ICE
MSCI WORLD ESG LEADERS	ICE
MSCI JAPAN ESG LEADERS	ICE
JPX-NIKKEI 400	JAPAN EXCHANGE
OMX30 ESG RESPONSIBLE	NASDAQ

Table 1. ESG Equity Index Futures Contracts

seen in Figure 1. Although there has been considerable growth, volumes and open interest in ESG equity index futures markets are still minuscule compared to the standard equivalent contracts, but this does not mean they are untradeable, as we see in the next section.

3. 'Tradability' of ESG Equity Index Futures in Systematic Portfolios

Although we have shown that volumes of ESG equity index futures are less than 1% of their unscreened standard counterparts, this does not necessarily mean they are untradeable at smaller account size.

If we wanted to maintain the current trading footprint, but in ESG equity index futures, what would be the maximum account size we could trade? We estimate that for the \$6B of trend-following assets we trade in our systematic strategies, we trade on a typical day less than 0.02% of the average daily S&P 500 e-mini

¹Sources: EUREX, ICE, MSCI, FIA

Contract	OI (contracts)	OI (\$)	Volume	Volume (\$)
E-MINI S&P500 ESG	7,111	1,180,405,250	1,037	172,189,429
EUROSTOXX 50 ESG	5,662	101,477,579	832	14,908,311
MSCI EM ESG SCREENED	15,956	301,015,330	1,040	19,616,905
STOXX 600 ESG-X	63,690	1,182,811,245	6,431	119,423,130
MSCI EM ESG LEADERS	4,965	295,748,028	422	25,147,911
OMXS30 ESG RESPONSIBLE	20,290	495,338,631	3,438	83,931,701

Table 2. Average daily ESG Equity Index Futures Contracts Volume and Open Interest (Q1 2021; Source: Bloomberg).

E-MINI	Open Interest	Volume
A. S&P 500 ESG	1,180,405,250	172,189,429
B. S&P 500	526,770,422,500	350,534,919,000
A/B	0.22%	0.05 %

(EURO)STOXX	Open Interest	Volume
A. 600 ESG-X	1,182,811,245	119,423,130
B. 50 ESG	101,477,579	14,908,311
C. 50 INDEX	148,784,887,402	46,165,360,615
(A+B)/C	0.86%	0.29%

MSCI	Open Interest	Volume
A. EM ESG SCREENED	301,015,330	19,616,905
B. EM ESG LEADERS	295,748,028	25,147,911
C. EMERGING INDEX	83,346,139,718	11,210,502,164
(A+B)/C	0.72%	0.40%

Table 3. Average Daily Volume and Open Interest for ESG Equity Index Futures vs Standard Equity Index Futures (Q1 2021; Source: Bloomberg).

	Market (\$)	GC Trend (\$)	%
E-MINI S&P 500	350,534,919,000	60,983,923	0.017%

Table 4. Estimated Average Daily \$ Trading Volumes for Graham Core Trend-following Strategy in the S&P 500).

futures contract for example (the equity index contract with our highest average daily \$ volume). If we wanted to maintain that level of impact with the ESG versions, we find the maximum account size would be less than \$3M (based on Tables 3 and 4).

Taking a more pragmatic approach, we estimate that as long as the maximum position we expected to trade in ESG equity index futures was less than 10% of current open interest, and similarly, the maximum daily trading volume was less than 30% of average daily volume, then we would not dominate the market. Furthermore, in line with this pragmatic approach, we assume that we trade only US and European equity indices given the lack of volume in Asian ESG equity index futures (and that Asia accounts for less than 20% of the equity index futures we trade) and use the full range of local ESG options in these regions.

Based on the data in Table 2 and Figure 1, we see that the current open interest in both the US and European ESG equity index futures is in the region of \$2B, and the average daily volumes in US and European ESG equity index futures are \$172.2M

and \$134.3M, respectively. Analysis of this data suggests that to stay within 10% of open interest at all times in both the US and Europe, we would need to manage an account size of no more than USD 238. To stay within 30% of ADV in both the US and Europe, we would need to manage an account size of no more than \$117M (once the positions and volumes we would add to the market are included in the estimate). If we manage an account of \$117M, we would be on average less than 2% of open interest and average daily volume in both the US and Europe. Thus, this is a conservative estimate, especially when considering the ongoing rapid market growth.

Other than footprint, there are some other issues that should be considered when assessing tradability. To the negative, ESG futures cannot yet be traded electronically. They would need to trade directly through a high-touch broker desk, creating less controllable slippage and increasing transaction-costs. To the positive, volumes and open interest have been increasing considerably in some ESG equity index futures. Recent months have hit record highs and anecdotal evidence through brokers suggesting considerable buy-side interest. Furthermore, in addition to futures markets, there is a well-developed ESG ETF/iShares market that could be utilized to create a deeper opportunity set (but as a step further away from futures trading falls outside the scope of this paper). Having established that it would be hypothetically possible to replace equity index futures with ESG variants in our accounts for account size of around \$117M (and growing rapidly) in the next section we now look at whether the profitability of trading these instruments is comparable.

4. Can ESG Equity Index Futures be Traded Profitably in a Trend-Following Portfolio?

We have run simulations using in-house basic core trend models with S&P 500 and Eurostoxx 600 ESG equity index futures replacing the existing equity index futures currently traded with three different ‘levels’ of replacement:

1. ESG equity index futures replace standard equity index futures in entirety;
2. ESG equity index futures replace standard equity index futures in the US and Europe in entirety only (as we have established above there are no suitably liquid ESG replacements in other regions);
3. ESG equity index futures replace only the corresponding standard equity index futures S&P 500 ESG replaces the S&P 500 only, and Eurostoxx ESG replaces Eurostoxx only).

per \$100m traded	US	EUROPE	ASIA
Maximum Net Position (\$)	81,788,326	87,556,068	53,047,192
Average Net Position (\$)	29,871,697	17,812,750	9,478,965
Maximum Daily Net Trade Size (\$)	42,678,599	34,723,058	7,598,060
Average Daily Net Trade Size (\$)	2,581,858	1,661,008	588,599

Table 5. Maximum and Average Daily Data For Equity Index Futures Exposure per \$100m for Graham’s Core Trend-following Strategy (Inception to Q1 2021).

We use the same strategy with standard equity index futures as the ‘base case’ comparator. In these simulations, we have cleaned data and accounted for executions costs using well established in-house methodologies to best achieve realistic comparisons; we have run the comparison for the mutual lifetime of the ESG indices up to the time of study.

futures to replace their standard counterparts actually marginally improved profitability in simulation, at both equity component level and overall. We note that this is based on a relatively short-term simulation. Such a portfolio could only be run at a modest AUM in practice, but nonetheless, an encouraging result.

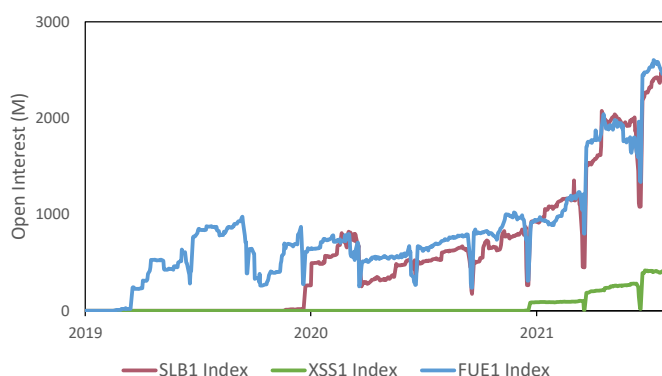


Figure 1. Growth of Open Interest for ESG Equity Index Futures in the US and Europe (Source: Bloomberg).

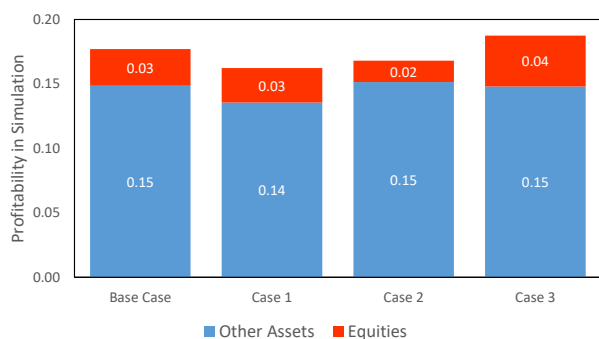


Figure 2. Simulated Returns by Asset Class and Overall for Basic Core Trend Models using ESG Equity Indices and Standard Equity Indices (over mutual life of indices 11.2019-4.2021).

In Figure 2 we see that for the CASE 1 and CASE 2 simulations, the equity component and the portfolio overall underperforms the base case. However, for CASE 3 the portfolio outperforms the base case both in the equity component and overall. We can conclude that, for the basic core trend models we used in simulation, replacing the standard equity indices in entirety with ESG equity index futures (within region or across the board) resulted in a reduction of profits at both equity component level and at portfolio level overall. However, using the ESG equity index

5. Conclusion

A simulation using basic core trend-following models suggests there could have been a marginal benefit to trading the Eurostoxx 600 ESG-X and S&P 500 ESG equity index futures as a replacement for the corresponding standard S&P 500 and Eurostoxx futures over the short (18 month) test period we analyzed. However, there would have been a marginal detriment to using these ESG futures to replace the equity portfolio in its entirety. Furthermore, we estimate that practical implementation of any of the above could be achieved for a portfolio of size of just over \$100M whilst remaining a conservatively small fraction of the average daily volume and open interest of the ESG contracts. The ongoing growth in ESG equity index futures liquidity and open interest suggests that the tradeable portfolio size is rapidly increasing.

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