

The expected returns of ESG excluded stocks. Shocks to firms costs of capital? Evidence from the Worlds' largest fund.

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Research issue

- ESG - Environmental, Social and Governance aspects of corporate decisions.
- Institutional investors unwilling to invest in “bad” ESG firms.
- Generally – Does ESG affect companies?
 - Cost of capital/stock return?
 - Pecuniary view (The BlackRock Argument)
Firms preparing for the new sustainable economy
→ will do better (doing well by doing good).
(Mispricing argument)
 - Non-pecuniary view.
Investors care about sustainability in addition to returns.
→ Sustainable firms have lower cost of capital.
 - Company Behaviour?
 - Do companies take actions to avoid being excluded?
- How best to save the planet?

Research issue ctd

Our research: The exclusions by Norway's GPFG “(The oil Fund)”
– Huge Sovereign Wealth Fund.

- Exclusions ethically motivated – “worst offenders”
- Investigate:
 - The return of the portfolio of excluded firms
 - Lead to estimate of Green Return Premium
 - Firm reactions to their exclusions
 - Behavioural changes?

Our Analysis – Preview

Construct portfolio of excluded firms.

- Is there a return premium (alpha) on this portfolio?
→ **Yes**
- Is this due to short-term overreactions, or long term cost of capital?
→ **It is the long term cost of capital**
- Implication: Premium on being ethical (“Green Return Premium”)
→ $\approx -5\%$

After firms get on the exclusion list

- Are firms happy with their high cost of capital?
→ **No, they try get their exclusions revoked to get back to a lower cost of capital.**
- If a firm’s exclusion is revoked, what happens to cost of capital?
→ **It Falls**

Literature etc

Modelling differences in cost of capital due to ESG

- The pecuniary view.
 - Stock prices do not fully reflect future ESG consequences (e.g. climate).
 - Short-termism (Stein, 1989)
- The non-pecuniary view
 - Equilibrium models – tradeoff ESG/Cost of Capital
 - Pástor et al. (2021) Pedersen et al. (2021)
 - Question magnitude exclusion effects (Berk and van Binsbergen, 2024)
 - ESG ranking uncertainty muddle tradeoff (Avramov et al., 2022)

Estimates of Green Return Premium

- Evidence support non-pecuniary view (Green Return Premium < 0)
Examples (estimated return difference)
 - Sin (Hong and Kacperczyk, 2009) (-3.5%)
 - Environment (Chava, 2014) (-0.7% to -1.4%)
 - Green vs Brown (Pástor, Stambaugh, and Taylor, 2022) (-1.4%)

Literature ctd – The magnitude of the green premium

Cost of improving ESG argument

The return difference is a tradeoff between:

- Cost of removing reasons for exclusion (becoming more ethical)
- Benefits from lower cost of capital.

Example from (Hong, Wang, and Yang, 2023) (decarbonization):

Equilibrium return difference (green premium) = $-m/q$,

(m – cost of mitigation per unit of production, q – price of firm capital.

→ If green premium reflects costs of mitigation,
green return premium can be large

Arbitrage type counterargument (Berk and van Binsbergen, 2024)

Investors not concerned with ESG jump on return premium

→ Green premium should be small in magnitude.

Literature ctd – Prior analysis of the oil fund's exclusions

- Event studies. Negative CAR when exclusion announced
 - Atta-Darkua (2022),
 - Ayoubi and Enjolras (2020),
 - Eriksen, Lindset, Nguyen, and Skara (2020).
- Long term performance of excluded portfolio.
(Hoepner and Schopohl, 2018) Shorter time period.

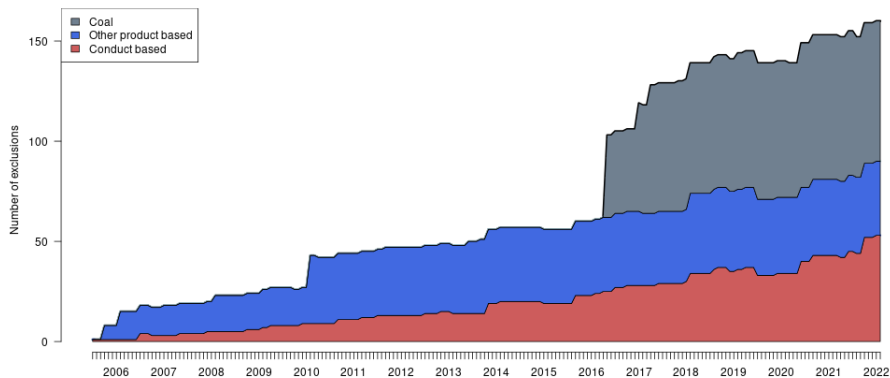
Norway's GPF (The Oil Fund)

- World's largest SWF. Market value of equity 1 trillion USD at the end of 2021.
- One of the most transparent such funds, model for many institutional investors.
- Near index fund.
- Exclusions handled by external "Council of Ethics", established 2004.
 - 2004–2021: 189 firms in total excluded, shorter or longer time periods.
 - At yearend 2021, fund invested in ≈ 10 thousand companies
 - \rightarrow exclusions are truly exceptional

Norway's GPFG – The reasons for exclusions

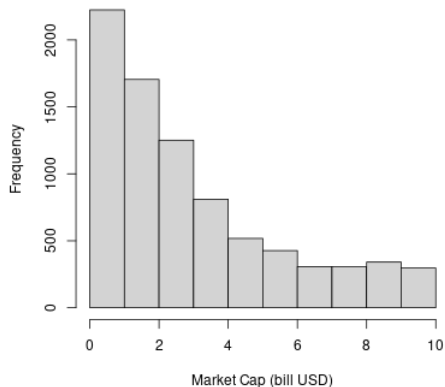
| Exclusion reasons | Events |
|--|--------|
| Conduct | 67 |
| Environmental damage | 28 |
| Individuals' rights in war or conflict | 12 |
| Violation of human rights | 12 |
| Environmental damage / Violation of human rights | 4 |
| Violation of ethical norms | 5 |
| Greenhouse gas emissions | 4 |
| Gross corruption | 2 |
| Product | 122 |
| Coal or coal-based energy | 75 |
| Weapons | 26 |
| Tobacco | 21 |

Norway's GPFG – The number of exclusions

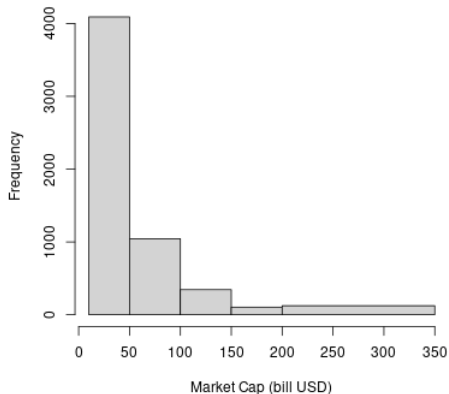


Norway's GPFG – Size (market cap) distribution of excluded firms

B.1: Mkt Cap \leq 10 bill USD



B.2: Mkt Cap $>$ 10 bill USD

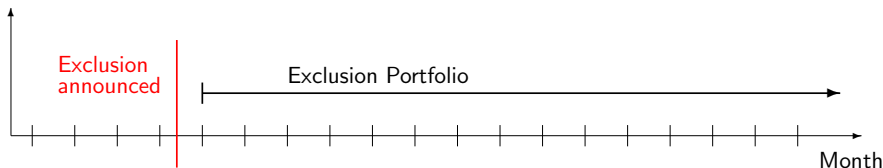


Empirics Part I: Estimating the green return premium

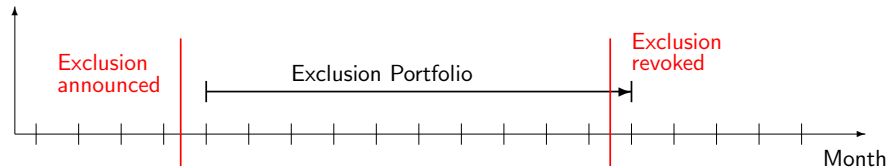
- Construct the returns of Exclusion portfolio
- Asset pricing evaluation of return difference (alpha)
- Robustness.
- Consequences for the green return premium.

Empirics I: Constructing the Exclusion Portfolio

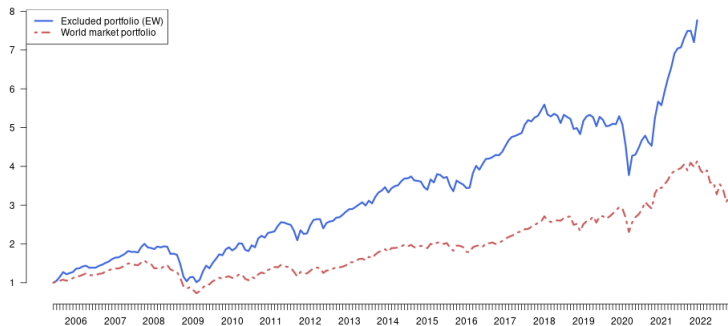
- Firms enter portfolio month after exclusion



- If exclusion revoked, firms leave exclusion portfolio next month.



Empirics I: Value evolution – exclusion portfolio vs market



Cumulative returns of equally weighted exclusion and global market portfolios

Empirics I: Estimates of the green return premium

Brown return premium (return premium for excluded firms) estimated as

- Alpha (the risk-adjusted excess return) of the Excluded Portfolio.
- Estimated using: Fama-French international five factor model

$$(r_{p,t} - r_{f,t}) = \alpha + \beta(r_{m,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_{p,t},$$

- This model necessary to control for business cycle effects (Bansal et al., 2021)
- (do show estimates with alternative asset pricing models)

Empirics I: Estimates of alpha for (EW) Exclusion Portfolio

| | (1) | (2) | (3) | (4) |
|-----------------------------------|---------------------|---------------------|---------------------|----------------------|
| Alpha | 0.004*** (0.002) | 0.004** (0.002) | 0.004*** (0.002) | 0.005*** (0.002) |
| Rm-Rf | 0.961*** (0.040) | 1.021*** (0.049) | 0.993*** (0.042) | 0.962*** (0.049) |
| SMB | 0.173 (0.115) | | 0.178 (0.115) | 0.177 (0.123) |
| HML | 0.467*** (0.115) | | 0.310*** (0.074) | 0.224*** (0.089) |
| RMW | 0.155 (0.156) | | | |
| CMA | -0.257 (0.233) | | | |
| WML | | | | -0.138*** (0.076) |
| Annualized Alphas(percent) | 5.170 | 4.420 | 5.220 | 5.980 |
| Adj. R ² | 0.809 | 0.788 | 0.808 | 0.813 |

Empirics I: From alpha to green return premium

- Alpha: $> 5\%$ in annual terms — economically and statistically significant
- Finding robust to
 - asset pricing model
 - weighting scheme (equal, value weighted)
 - subportfolios: reason for exclusion, country (US).

Conclude:

The alpha is the premium on unethical excluded firms.

The green return premium then the negative of this.

→ We estimate a (negative) green premium of $\approx -5\%$.

Empirics I: Concern: Short term announcement effect

Potential contribution to the high estimate (5%)

- Short term price pressure from exclusion?
- Changes to long term cost of capital?

Various estimates to show this is not only a short term effect

- Wait longer before enter exclusion portfolio
- Look at exclusion portfolio *before* oil funds exclusion
- Event study estimates $\approx 1.5\%$ (one time event).

→ The estimated return is chiefly due to long-term return differences.

Empirics I: Conclude: Green premium estimates

- The green premium is negative, in line with
 - a non-pecuniary explanation,
 - the majority of estimates in the literature.
- The point estimate of -5% is larger in magnitude than most other estimates
 - Possibly due to the sample being only the “worst offenders”

Empirics Part II: Firms deciding whether to improve to get exclusion revoked

Point when an exclusion is announced

– from potential to actual exclusion

→ Revision of expectations

– expected cost of capital increase?

Time to revisit the firm's evaluation of the tradeoff?

Sample: Exclusions revoked due to:

| Cause | no |
|-----------------------|----|
| Change of product mix | 11 |
| Cease of activity | 7 |
| Sale of subsidiary | 4 |
| Other reasons | 6 |
| Total | 28 |

Empirics II – Revoking exclusions – analysis

Actions to improve ESG leading to exclusion revoked

→ Endogenous action by firms

Trading off

- Cost of improving ESG (Cause of exclusion)
- Benefits from a lower cost of capital (cheaper to raise capital)

Motivate empirical investigations – proxies

- A. Costs of improving – ESG score when excluded.
- Benefits of low cost of capital –
 - B. Capital needs
(Revenue increase → Need for scale investments)
 - C. Actual capital raising.
- D. Result of action – cost of capital after exclusion revoked.

Empirics II.A: What determines time till exclusion is revoked?

Duration (survival) analysis of exit from Exclusion Portfolio.

Allows estimation of how e.g. cost of improvement affects time till exit.

Estimates

- ESG score when excluded – (negative coefficient)
 - Low ESG score when entering exclusion portfolio
 - lower time till exit.

Possible interpretation: Cost of improving ESG low when starting from a low (ESG) base.

Controls:

- Conduct based exclusion dummy (easier to fix conduct based than product based reasons for exclusion)
- Firm Market Capitalization

Empirics II.B: Benefits from cheaper cost of capital

Benefits of low cost of capital arise when firm needs to raise new external capital.

Argue: Higher likelihood of raising capital – increased benefits.

Empirically: Higher Revenue – Higher investment needs

Empirical formulation:

Probit - Model probability of having exclusions revoked as a function of

- Revenue growth – negative relation:
High revenue growth → higher probability of exclusion revoked.
- Earnings growth – no relation

Empirics II.C: Another estimate of benefit of low cost of capital

Actual equity deals – raising new equity capital

- High probability of raising capital after exclusion revoked

| | Firms raising capital | |
|------------------------------|-----------------------|---------|
| | Number | Percent |
| Firms still excluded | 56 | 37.1 |
| Firms with exclusion revoked | 11 | 57.9 |

Empirics II.D: Do cost of capital fall after exclusion revoked?

Estimates of alpha for the post-exclusion portfolio

| | (1) | (2) | (3) | (4) |
|-----------------------------------|---------------------|---------------------|---------------------|---------------------|
| Alpha | -0.002 (0.003) | -0.002 (0.003) | -0.001 (0.003) | 0.000 (0.003) |
| Rm-Rf | 1.080*** (0.077) | 1.085*** (0.073) | 1.061*** (0.073) | 1.033*** (0.076) |
| SMB | 0.335 (0.221) | | 0.250 (0.209) | 0.245 (0.208) |
| HML | 0.271 (0.215) | | 0.235* (0.123) | 0.128 (0.144) |
| RMW | 0.326 (0.292) | | | |
| CMA | 0.107 (0.345) | | | |
| WML | | | | -0.192 (0.136) |
| Annualized Alphas(percent) | -2.230 | -1.970 | -0.860 | 0.300 |
| Adj. R ² | 0.604 | 0.596 | 0.606 | 0.609 |
| Num. obs. | 149 | 149 | 149 | 149 |

Key takeaways

- ① *Green return premium* estimate $\approx -5\%$.
 - Negative in line with most of literature
 - *Magnitude* of the return difference linked to ESG higher than most estimates, possibly due to sample of “worst offenders.”
- ② *Dynamics* of corporate reactions to exclusion.
More likely to see exclusion revoked if
 - ESG “really bad” at exclusion (cheaper to rectify?)
 - Revenue growth high (investment needs?)

Extra tables and results

Extra material - data - Exclusions over time

| Year | New Exclusions | Exclusions Revoked | Re-exclusions |
|-------|----------------|--------------------|---------------|
| 2005 | 9 | | |
| 2006 | 11 | 1 | |
| 2007 | 2 | | |
| 2008 | 4 | | |
| 2009 | 5 | 2 | |
| 2010 | 21 | 1 | |
| 2011 | 5 | 1 | |
| 2012 | 1 | | |
| 2013 | 9 | 3 | |
| 2014 | 1 | 1 | |
| 2015 | 4 | | |
| 2016 | 61 | | |
| 2017 | 11 | 1 | |
| 2018 | 13 | 2 | 1 |
| 2019 | 5 | 6 | |
| 2020 | 15 | 3 | |
| 2021 | 12 | 5 | |
| Total | 189 | 26 | 1 |

Extra material - data - Exclusions by industry

| Industry | TRBC Code | Exclusions | Exclusions Revoked |
|--|-----------|------------|--------------------|
| Electrical Utilities & IPPs | 591010 | 56 | 2 |
| Aerospace & Defense | 521010 | 20 | 7 |
| Food & Tobacco | 541020 | 18 | |
| Coal | 501010 | 14 | |
| Metals & Mining | 512010 | 14 | 3 |
| Construction & Engineering | 522010 | 10 | 1 |
| Oil & Gas | 501020 | 9 | 3 |
| Chemicals | 511010 | 6 | 2 |
| Paper & Forest Products | 513010 | 5 | |
| Pharmaceuticals | 562010 | 5 | |
| Freight & Logistics Services | 524050 | 4 | 1 |
| Textiles & Apparel | 532020 | 4 | 1 |
| Consumer Goods Conglomerates | 544010 | 3 | 1 |
| Multiline Utilities | 591040 | 3 | |
| Real Estate Operations | 601010 | 3 | |
| Automobiles & Auto Parts | 531010 | 2 | 1 |
| Homebuilding & Construction Supplies | 532030 | 2 | 1 |
| Machinery, Equipment & Components | 521020 | 2 | |
| Professional & Commercial Services | 522030 | 2 | |
| Communications & Networking | 571020 | 1 | |
| Diversified Industrial Goods Wholesalers | 522020 | 1 | |
| Diversified Retail | 534020 | 1 | 1 |
| Food & Drug Retailing | 543010 | 1 | 1 |
| Hotels & Entertainment Services | 533010 | 1 | |
| Insurance | 553010 | 1 | 1 |
| Specialty Retailers | 534030 | 1 | |
| Total | | 189 | 26 |

Extra material - data - Exclusions by country

| Country | Exclusions | Exclusions Revoked |
|--------------------|------------|--------------------|
| United States | 51 | 10 |
| China | 27 | 2 |
| India | 13 | |
| United Kingdom | 11 | 5 |
| Israel | 10 | |
| Canada | 9 | 1 |
| Japan | 8 | |
| Malaysia | 8 | |
| South Korea | 7 | 1 |
| Brazil | 5 | |
| Australia | 4 | |
| Poland | 4 | 1 |
| South Africa | 3 | 1 |
| Taiwan | 3 | |
| Thailand | 3 | 1 |
| Chile | 2 | |
| Czech Republic | 2 | |
| France | 2 | 1 |
| Mexico | 2 | 2 |
| Netherlands | 2 | |
| Philippines | 2 | |
| Egypt | 1 | |
| Germany | 1 | |
| Greece | 1 | |
| Indonesia | 1 | |
| Ireland | 1 | |
| Italy | 1 | 1 |
| Peru | 1 | |
| Russian Federation | 1 | |
| Ci | 1 | |

Extra material - data - Sample of stocks

| Status | Events |
|----------------------------|--------|
| Total exclusions | 189 |
| Exclusion revoked | 26 |
| Excluded again | 1 |
| Not matched with Refinitiv | 5 |
| Total sample | 184 |
| Conduct-based exclusions | 67 |
| Product-based exclusions | 122 |

Overview of the exclusions, revocations and sample content. Data from the Ethical council, GPFG and Refinitiv.

Extra material - data - Equity data - Descriptives

| | min | mean | med | max |
|--------------------------|-------|------|-----|-------|
| Monthly Return (percent) | -72.8 | 1.1 | 0.6 | 166.2 |
| Market Cap (bill USD) | 0.0 | 20.4 | 6.0 | 315.8 |

Extra material - exclusion portfolio - Descriptives

Panel A: Equally weighted exclusion portfolio

| | gmn | | | | | |
|---------------------------|--------|------|-------------------------|---------|------|------|
| | Market | All | EW Exclusion Portfolios | | | |
| | | | Conduct | Product | Coal | US |
| Average return (%) | 0.79 | 1.17 | 1.44 | 1.00 | 1.02 | 1.24 |
| Std.dev | 0.79 | 5.21 | 7.73 | 4.92 | 4.33 | 5.06 |
| Average excess return (%) | 0.01 | 1.07 | 1.35 | 0.91 | 0.94 | 1.14 |
| Sharpe Ratio | 0.15 | 0.21 | 0.17 | 0.18 | 0.22 | 0.23 |
| n | 199 | 199 | 199 | 196 | 69 | 199 |

Panel B: Value weighted exclusion portfolio

| | VW Exclusion Portfolios | | | | | |
|---------------------------|-------------------------|------|---------|---------|------|------|
| | Market | All | Conduct | Product | Coal | US |
| Average return(%) | 0.79 | 1.37 | 1.67 | 1.22 | 1.27 | 1.37 |
| Std.dev | 0.79 | 4.23 | 5.64 | 4.77 | 3.47 | 4.11 |
| Average excess return (%) | 0.01 | 1.28 | 1.58 | 1.13 | 1.19 | 1.28 |
| Sharpe Ratio | 0.15 | 0.30 | 0.28 | 0.24 | 0.34 | 0.31 |
| n | 199 | 199 | 199 | 196 | 69 | 199 |

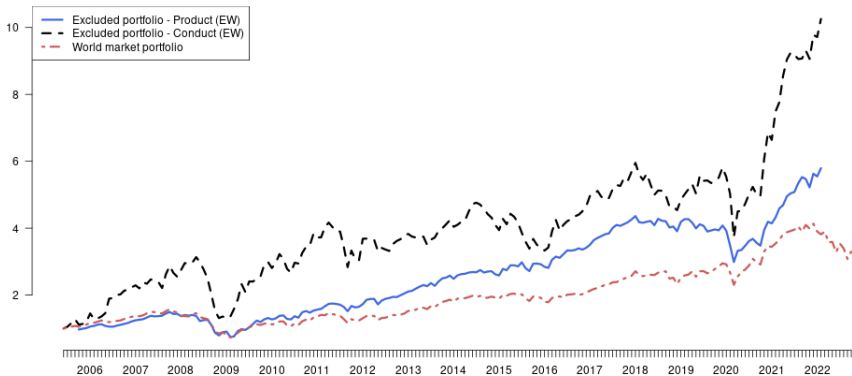
Describing portfolio returns for the various exclusion portfolios. All returns in USD. Returns and

Extra material - exclusion portfolio - Estimates of alpha for (VW) Exclusion Portfolio

| | (1) | (2) | (3) | (4) |
|-----------------------------------|----------------------|---------------------|----------------------|----------------------|
| Alpha | 0.006*** (0.002) | 0.007*** (0.002) | 0.007*** (0.002) | 0.007*** (0.002) |
| Rm-Rf | 0.871*** (0.040) | 0.801*** (0.038) | 0.809*** (0.037) | 0.817*** (0.038) |
| SMB | -0.313*** (0.113) | | -0.421*** (0.116) | -0.421*** (0.111) |
| HML | 0.183* (0.102) | | 0.264*** (0.078) | 0.287*** (0.100) |
| RMW | 0.340*** (0.143) | | | |
| CMA | 0.373*** (0.139) | | | |
| WML | | | | 0.036 (0.064) |
| Annualized Alphas(percent) | 6.850 | 9.000 | 9.010 | 8.810 |

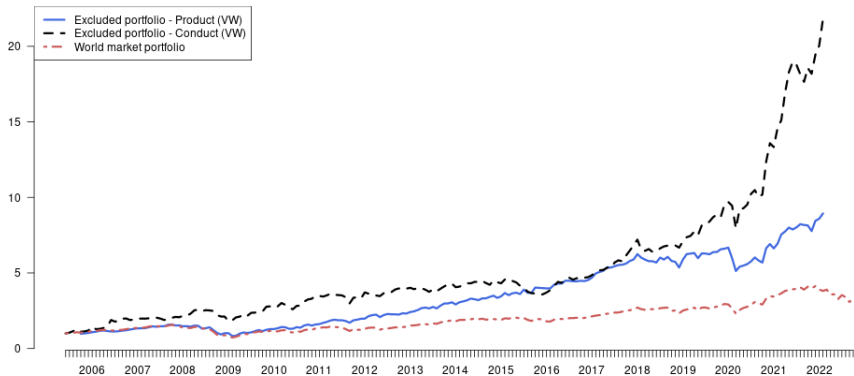
Extra material - exclusion portfolio - Conduct and product based value evolution (EW)

Panel A: Equally weighted exclusion portfolio



Extra material - exclusion portfolio - Conduct and product based value evolution (VW)

Panel B: Value weighted exclusion portfolio

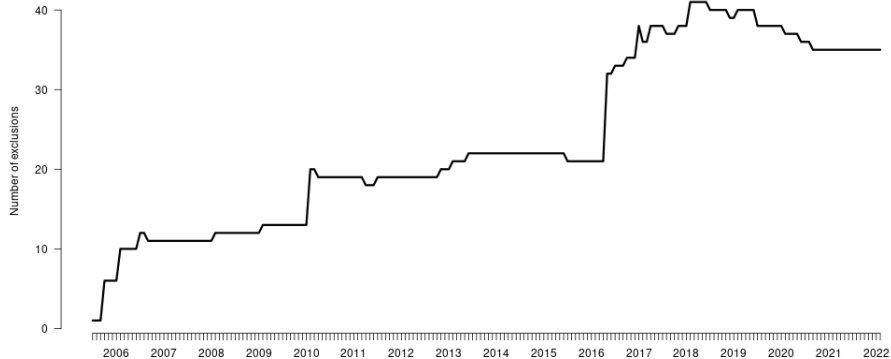


Extra material - exclusion portfolio - Conduct and product based exclusion

| | Conduct | | Product | |
|-----------------------------------|----------------------|---------------------|---------------------|---------------------|
| | EW | VW | EW | VW |
| Alpha | 0.007* (0.004) | 0.009*** (0.003) | 0.003 (0.002) | 0.004** (0.001) |
| Rm-Rf | 1.061*** (0.130) | 0.793*** (0.077) | 0.926*** (0.037) | 0.935*** (0.037) |
| SMB | 0.139 (0.293) | -0.269 (0.255) | 0.167 (0.136) | -0.280** (0.128) |
| HML | 0.967*** (0.214) | 0.293 (0.165) | 0.295*** (0.107) | 0.208* (0.107) |
| RMW | 0.231 (0.349) | 0.419 (0.285) | 0.164 (0.174) | 0.345* (0.211) |
| CMA | -1.241*** (0.412) | 0.306 (0.244) | 0.070 (0.167) | 0.305* (0.157) |
| Annualized Alphas(percent) | 8.540 | 11.310 | 3.370 | 4.680 |

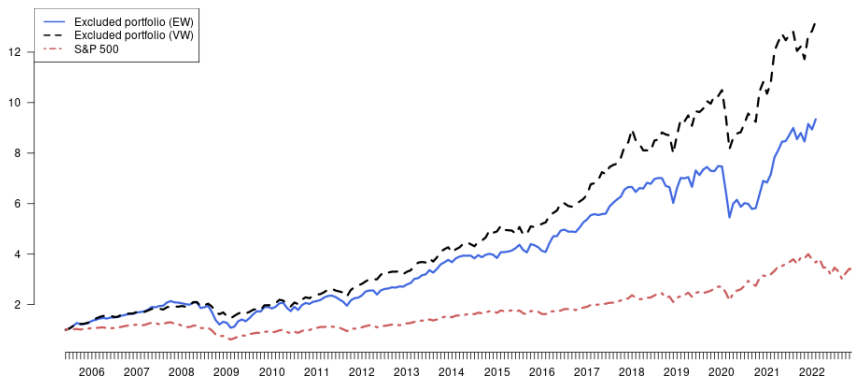
Extra material - exclusion portfolio - US Exclusion Portfolio

Panel A: Number of exclusions



Extra material - exclusion portfolio - US Exclusion Portfolio

Panel B: Cumulative returns



Extra material - exclusion portfolio - US Exclusion Portfolio

| | Equally Weighted | Value Weighted |
|-----------------------------------|---------------------|----------------------|
| Alpha | 0.004* (0.002) | 0.006*** (0.002) |
| Rm-Rf | 0.925*** (0.050) | 0.783*** (0.045) |
| SMB | 0.012 (0.089) | -0.280*** (0.080) |
| HML | 0.239*** (0.081) | 0.168*** (0.073) |
| RMW | 0.050 (0.117) | 0.258*** (0.106) |
| CMA | 0.073 (0.146) | 0.173 (0.132) |
| Annualized Alphas(percent) | 4.870 | 7.200 |
| Adj. R ² | 0.710 | 0.644 |
| Num. obs. | 200 | 200 |

Extra material - exclusion portfolio - Alpha estimation for Subperiods

Panel A: Equally weighted exclusion portfolio.

| | (2005–15) | (2016–21) |
|-----------------------------------|----------------------|---------------------|
| Alpha | 0.006*** (0.002) | 0.003 (0.002) |
| Rm-Rf | 0.955*** (0.057) | 0.930*** (0.071) |
| SMB | 0.070 (0.130) | 0.372* (0.165) |
| HML | 0.331** (0.188) | 0.231 (0.145) |
| RMW | -0.027 (0.297) | 0.197 (0.176) |
| CMA | -0.623*** (0.154) | 0.458* (0.252) |
| Annualized Alphas(percent) | 7.860 | 3.320 |

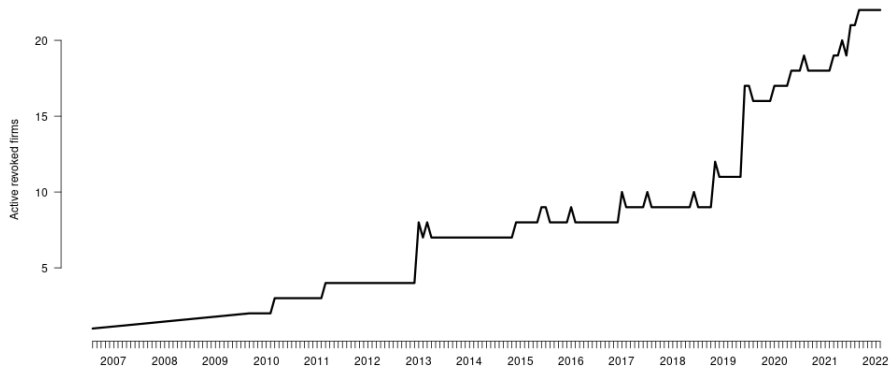
Extra material - exclusion portfolio - Alpha estimation for Subperiods

Panel B: Value weighted exclusion portfolio.

| | (2005–15) | (2016–21) |
|-----------------------------------|----------------------|---------------------|
| Alpha | 0.007*** (0.002) | 0.004* (0.001) |
| Rm-Rf | 0.840*** (0.040) | 0.958*** (0.046) |
| SMB | -0.402*** (0.134) | -0.317* (0.161) |
| HML | -0.064 (0.141) | 0.128 (0.178) |
| RMW | 0.274 (0.195) | 0.183 (0.203) |
| CMA | 0.168 (0.144) | 0.704*** (0.264) |
| Annualized Alphas(percent) | 8.440 | 5.010 |

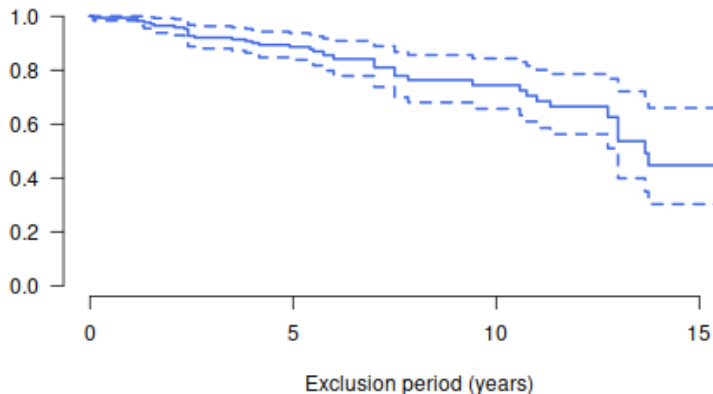
Extra material – Revoking exclusion – Post-Exclusion portfolio

Panel A: Number of stocks with exclusions revoked and still listed



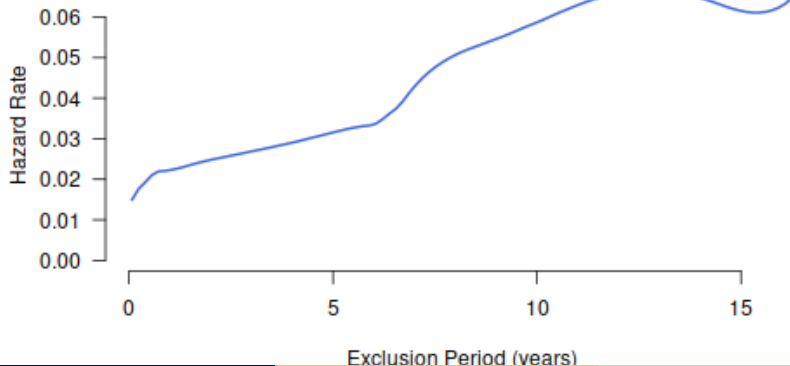
Extra material – Revoking exclusion – Duration (survival) analysis of exit from Exclusion Portfolio

Panel A. Survival curve



Extra material – Revoking exclusion – Duration (survival) analysis of exit from Exclusion Portfolio

Panel B. Instantaneous hazard curve (smoothed)



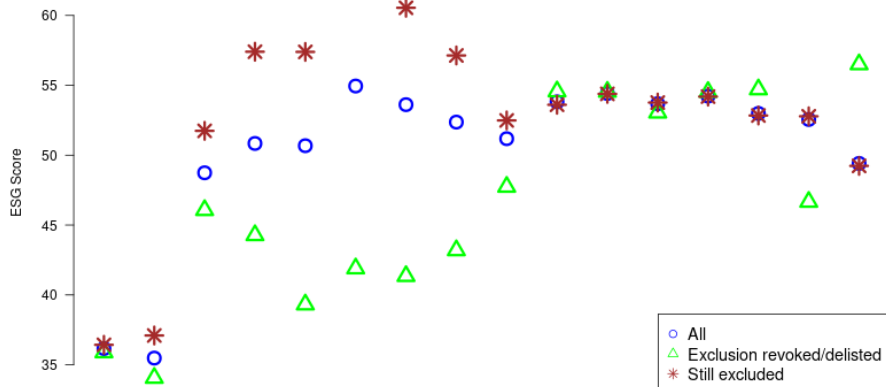
Extra material – Revoking exclusion – Duration (survival) analysis of exit from Exclusion Portfolio

Contributions to survival of exclusion

| | (1) | (2) | (3) | (4) |
|---------------------|--------------------|--------------------|-------------------|-------------------|
| ESG Score | -0.03*** (0.01) | -0.03*** (0.01) | -0.02** (0.01) | -0.03** (0.01) |
| Ind(Conduct) | | 0.85** (0.39) | | 0.98*** (0.44) |
| ln(Mkt Cap) | | | -0.05 (0.09) | -0.11 (0.10) |
| AIC | 219.27 | 217.21 | 221.05 | 218.16 |
| R ² | 0.03 | 0.06 | 0.04 | 0.07 |
| Max. R ² | 0.77 | 0.77 | 0.77 | 0.77 |
| Num. events | 28 | 28 | 28 | 28 |
| Num. obs. | 150 | 150 | 150 | 150 |
| PH test | 0.47 | 0.76 | 0.55 | 0.68 |

*** $p < 0.025$; ** $p < 0.05$; * $p < 0.1$

Extra material – Revoking exclusion – ESG Scores for firms with/without exclusion revoked

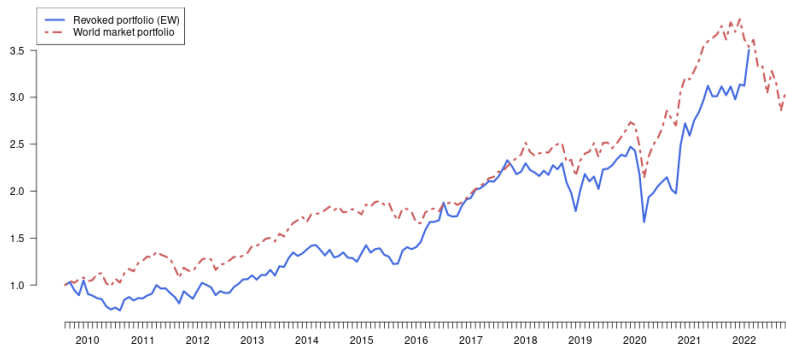


Extra material – Revoking exclusion – Probit estimation of determinants of discontinuation of exclusion

| | (1) | (2) | (3) | (4) |
|----------------|--------------------|--------------------|--------------------|--------------------|
| (Intercept) | -3.53*** (1.12) | -2.26*** (0.13) | -2.24*** (0.13) | -3.38*** (1.13) |
| Growth EPS | -0.02 (0.02) | -0.02 (0.02) | | |
| Ind(Conduct) | 0.69*** (0.19) | 0.66*** (0.19) | 0.52*** (0.19) | 0.54*** (0.19) |
| ln(Mkt Cap) | 0.06 (0.05) | | | 0.05 (0.05) |
| Growth Revenue | | | 0.46* (0.26) | 0.45* (0.26) |
| Log Likelihood | -97.86 | -98.51 | -99.08 | -98.55 |
| Num. obs. | 981 | 981 | 969 | 969 |

Extra material - The Post-Exclusion portfolio

Firms enter the post-exclusion portfolio month after exclusion is revoked.



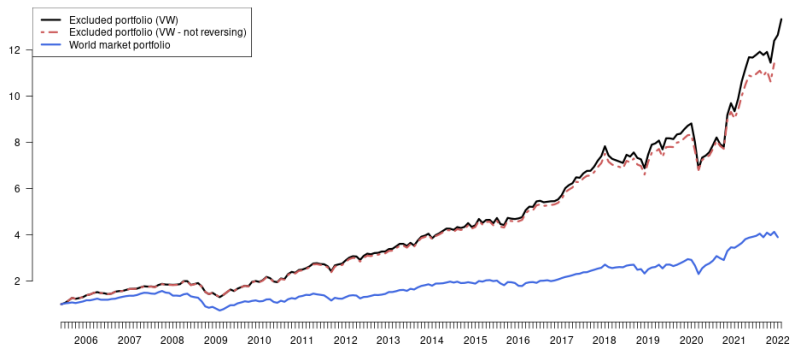
Cumulative returns for the Post-Exclusion Portfolio

Extra analysis - Is revocation a selection issue?

- The Exclusion portfolio – firms only in portfolio *while* excluded.
- Remove firms *post* exclusion. Selection problem?
 - What is the return on the portfolio of post-excluded firms?
 - What if we keep firms in the portfolio even if the exclusion is revoked?

Extra analysis - Is revocation a selection issue? – Keeping the firms with exclusion revoked

Compare Exclusion Portfolio with corresponding portfolio where firms whose exclusion is revoked is kept



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