

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.
- Of interest: Consequences of ESG-based portfolio exclusions on the expected returns of firms subject to exclusions?
- Theory: Tradeoff ESG/Cost of Capital
- Use: exclusions by the worlds largest fund.
 - What are the returns of the portfolio of excluded firms?
What are the implications for cost of capital?
 - Are firms reacting to their exclusions?
With consequences for cost of capital?

Exclusions in asset allocation

- Institutional investors
 - Need an opinion on the ESG characteristics of potential entrants to their portfolio
 - Dealing with low ESG ranking firms:
 - Dialogue – the most common.
Arguably a better way of achieving change
 - Exclusion: a reaction of last resort

Literature

- Equilibrium models – tradeoff ESG/Cost of Capital – Pástor et al. (2021) Pedersen et al. (2021)
- Uncertainty of ESG ranking : Muddle the tradeoff – (Avramov et al., 2022)
- Empirically, cost of equity capital decreases with ESG quality – Chava (2014), Ng and Rezaee (2015), Breuer et al. (2018)
- Institutional portfolios – are returns decreasing in quality of the funds ESG (Signing on to UN's Principles for Responsible Investment (PRI))?
Hedge funds → YES (Liang et al., 2022)
Mutual funds → Green-washing (Kim and Yoon, 2020)
Problem: Institutional portfolios additional layer
- “Sin stocks”
 - Booze, Guns, Tobacco → outperform (Hong and Kacperczyk, 2009).
 - Environment (Chava, 2014)
 - Carbon (Bolton and Kacperczyk, 2021)

Literature - ctd

- Analysis of the oil fund's exclusions
 - Event studies. (Atta-Darkua, 2022), (Eriksen et al., 2020)
 - Long term performance of excluded portfolio. (Hoepner and Schopohl, 2018)

Our Analysis – Preview

Construct portfolio of excluded firms.

- Does the portfolio have “too high” returns (alpha)?
→ **Yes**
- Is this due to short-term overreactions, or changes to long term cost of capital
→ **It is the long term cost of capital**

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**

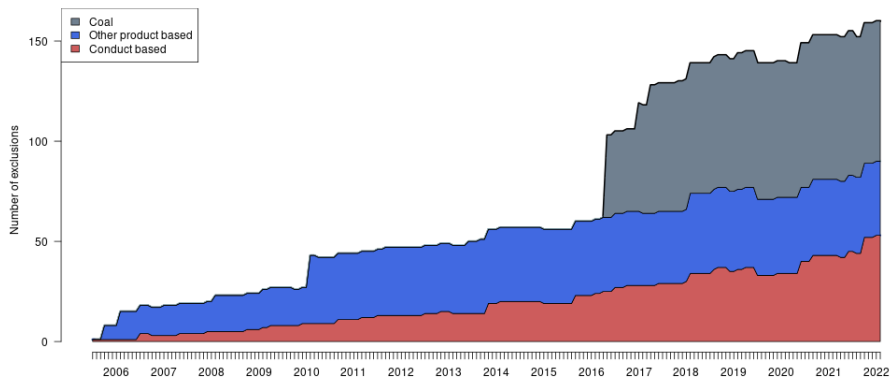
Norway's GPF (The Oil Fund)

- World's largest SWF. Market value of equity 1 trillion USD at the end of 2021.
- "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 \approx 10 thousand companies
 - \rightarrow exclusions are truly exceptional

The reasons for exclusions

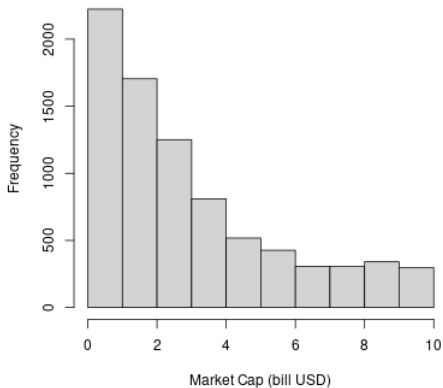
| Exclusion reasons | Events |
|--|--------|
| Conduct | 67 |
| Environmental damage | 28 |
| Individuals' rights in war or conflict | 12 |
| Violation of human rights | 12 |
| Environmental damage / Violation of human rights | 4 |
| Violation of ethical norms | 5 |
| Greenhouse gas emissions | 4 |
|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

The number of exclusions

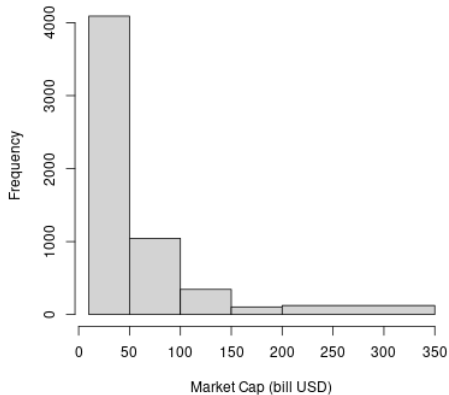


Equity data - Size distribution

B.1: Mkt Cap \leq 10 bill USD



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



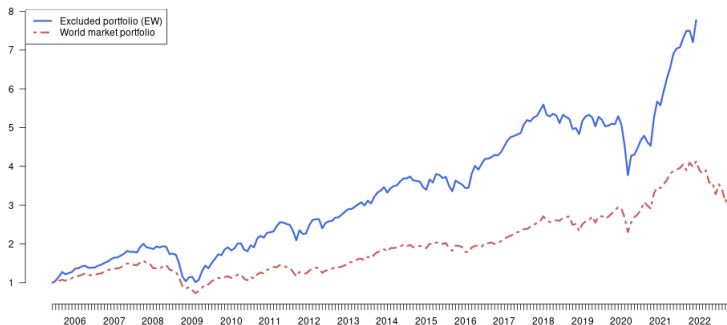
Construction Exclusion Portfolio

The exclusion portfolios represent the expected returns of stocks with low ESG rankings.

- Firms enter portfolio month after exclusion
- If exclusion revoked, firms leave exclusion portfolio.

Value evolution – exclusion portfolio vs market

- Exclusion portfolio perform better
- However, exclusion portfolio seem more exposed to crises ('08 and '20 covid)



Cumulative returns of equally weighted exclusion and global market portfolios

Testing for performance

- Investigate whether the exclusion portfolio has higher/lower returns than it “should have”.
- → Estimate the “alpha,” the risk-adjusted excess return. (Return that can not be explained by an asset pricing model).
- Asset pricing model: Fama-French international five factor model (but do check alternatives)

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

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 |

Estimates of alpha for Exclusion Portfolio

- Alpha: $> 5\%$ in annual terms — economically and statistically significant
- The exclusion portfolio substantial higher returns than it “should have”
- Finding robust to
 - asset pricing model
 - weighting scheme (equal, value weighted)
 - subportfolios: reason for exclusion, country (US).

Conclude:

The Excluded firms have a return premium.

Deconstructing alpha

Potential Explanations of the high alpha (5%)

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

Argue → The alpha too high to be explained by short term price corrections following an one-time price fall (event study return) in the region of 1.5 percent

Conclude:

Cost of capital has a substantial (bad) ESG premium.

Firm's reactions

How do firms react when they are excluded?

- No reaction.
- Reputational issue, some action in the press, but no real changes to firm's operations (green-washing).
- Firms act to reverse the exclusion.

Revoking exclusions

Firms remove cause of exclusions → Exclusions revoked
Exclusions revoked

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

Revoking exclusions – analysis

Actions to improve ESG leading to exclusion revoked

→ Endogenous action by firms

Trading off

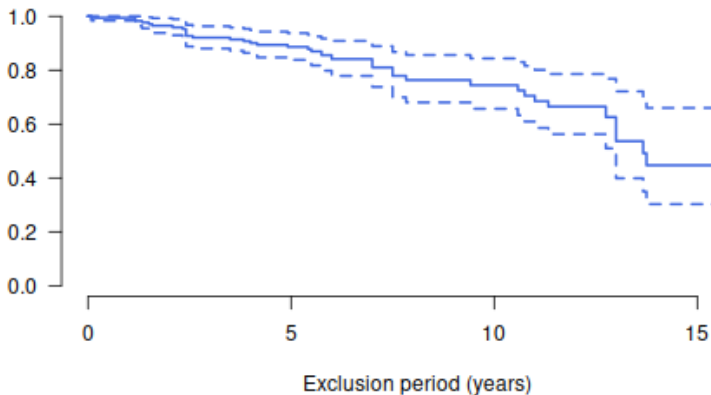
- Cost of improving ESG (Cause of exclusion)
- Benefits from a lower cost of capital (cheaper to raise capital)

Motivate empirical investigations – proxies

- Cost – ESG score when excluded.
- Benefits
 - Capital needs
(Revenue increase → Need for scale investments)
 - Actual capital raising

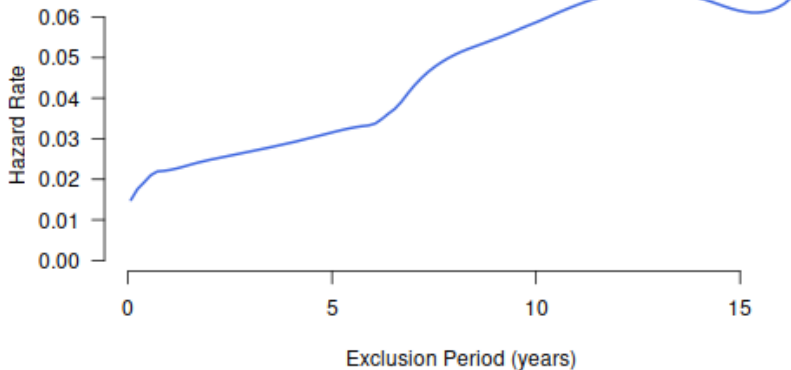
Duration (survival) analysis of exit from Exclusion Portfolio

Panel A. Survival curve



Duration (survival) analysis of exit from Exclusion Portfolio

Panel B. Instantaneous hazard curve (smoothed)



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 |

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

Duration (survival) analysis of exit from Exclusion Portfolio

Interpreting survival analysis

Explanatory variables:

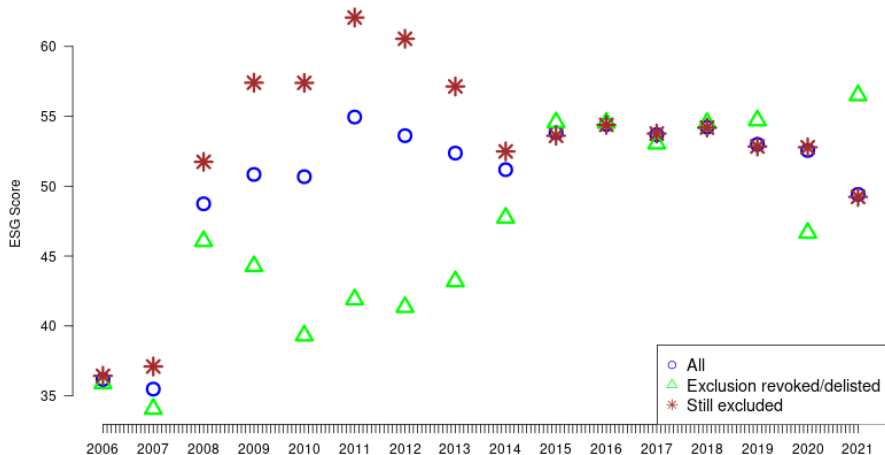
Of interest:

- 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 base.

Controls:

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

ESG Scores for firms with/without exclusion revoked



Benefits from cheaper cost of capital

Higher likelihood of raising capital – increased benefits?

Higher Revenue – Higher investment needs

To investigate:

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

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 |

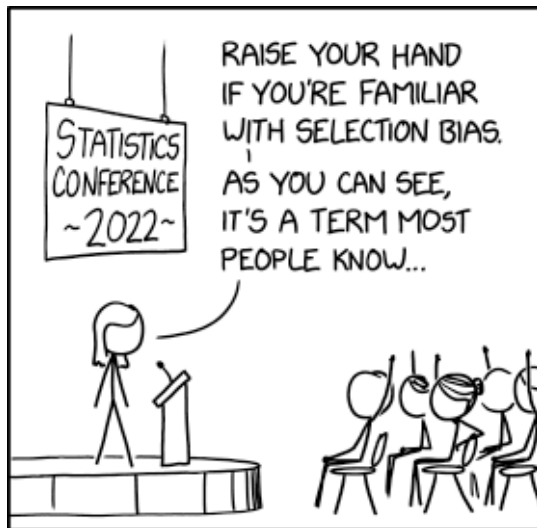
Revoking exclusions

Actual equity deals – raising new equity capital

- High probability of raising capital after exclusion revoked (albeit on a small sample).

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

Exclusion revoked → Selection problem?

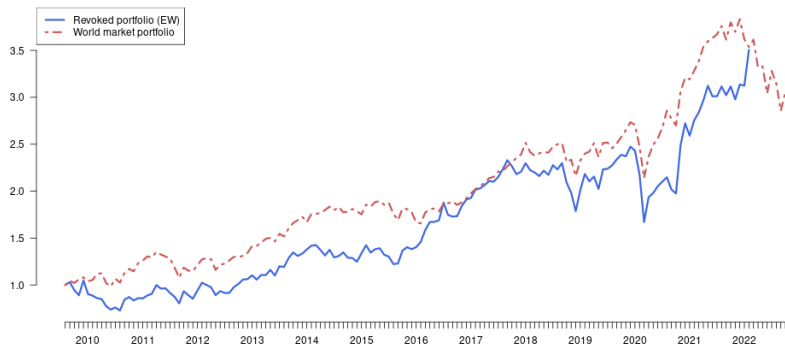


Exclusion revoked → Selection problem?

- 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?

The Post-Exclusion portfolio

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



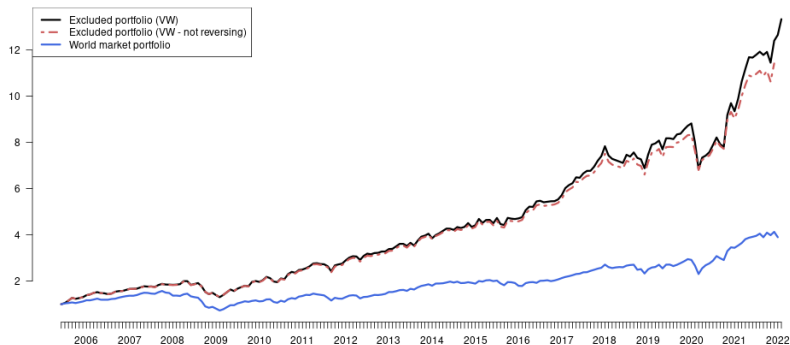
Cumulative returns for the Post-Exclusion Portfolio

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 |

Keeping the firms with exclusion revoked

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



Cumulative returns, Value Weighted portfolio

Conclusion

Prime contributions:

- ① Sheer *magnitude* of the return difference linked to ESG.
- ② *Speed* by which the increased cost of capital affects returns.
- ③ *dynamics* of corporate reactions to exclusion.

Interpretation

- Low quality ESG firms provide exceptionally high returns
- → The cost of capital for new investments for low quality ESG firms also exceptionally high.
- → To survive most low quality ESG firms have to move towards better quality ESG (“greener investments”) to lower their cost of capital
- From society’s point of view:
 - This is the desired outcome.
- To ponder:
 - Would this have happened without the exclusions?
 - Have the owners of the GPFM lost out?

Extra tables and results

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 |

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 |

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 | |

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.

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 |

Descriptives, exclusion portfolio returns

Panel A: Equally weighted exclusion portfolio

| | EW Exclusion Portfolios | | | | | |
|---------------------------|-------------------------|------|---------|---------|------|------|
| | Market | All | 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 |

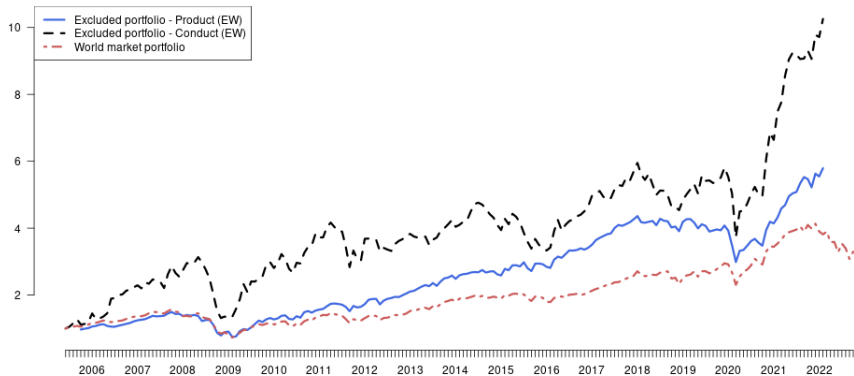
Describing portfolio returns for the various exclusion portfolios. All returns in USD. Returns and Excess returns in monthly percentage returns. Sharpe Ratio is $\text{avg}(r_i - r_f) / \text{sd}(r_i - r_f)$. The first column in each table describes the market portfolio where the market is provided by the Global

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 |
| Adj. R ² | 0.785 | 0.735 | 0.773 | 0.772 |

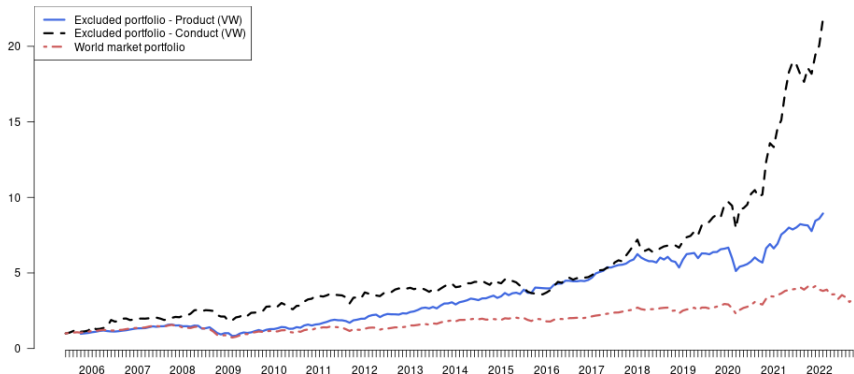
Conduct and product based value evolution (EW)

Panel A: Equally weighted exclusion portfolio



Conduct and product based value evolution (VW)

Panel B: Value weighted exclusion portfolio

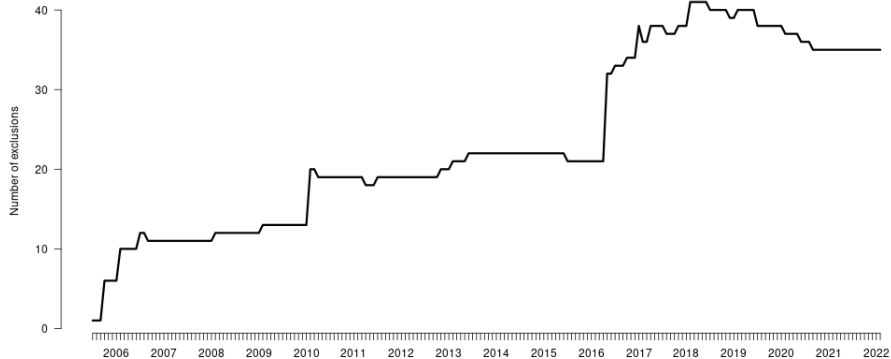


Conduct and product based exclusion

| | Conduct | | Product | |
|-----------------------------------|--------------|---------------|--------------|--------------|
| | EW | VW | EW | VW |
| Alpha | 0.007* | 0.009*** | 0.003 | 0.004** |
| | (0.004) | (0.003) | (0.002) | (0.001) |
| Rm-Rf | 1.061*** | 0.793*** | 0.926*** | 0.935*** |
| | (0.130) | (0.077) | (0.037) | (0.037) |
| SMB | 0.139 | -0.269 | 0.167 | -0.280** |
| | (0.293) | (0.255) | (0.136) | (0.128) |
| HML | 0.967*** | 0.293 | 0.295*** | 0.208* |
| | (0.214) | (0.165) | (0.107) | (0.107) |
| RMW | 0.231 | 0.419 | 0.164 | 0.345* |
| | (0.349) | (0.285) | (0.174) | (0.211) |
| CMA | -1.241*** | 0.306 | 0.070 | 0.305* |
| | (0.412) | (0.244) | (0.167) | (0.157) |
| Annualized Alphas(percent) | 8.540 | 11.310 | 3.370 | 4.680 |
| Adj. R ² | 0.579 | 0.371 | 0.766 | 0.731 |
| Num. obs. | 199 | 199 | 196 | 196 |

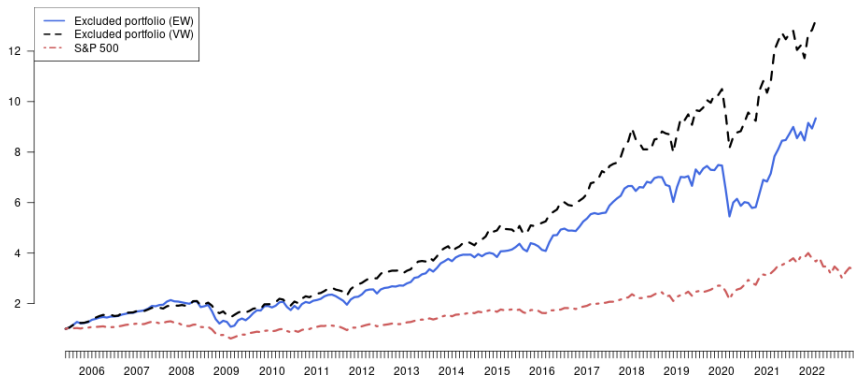
US Exclusion Portfolio

Panel A: Number of exclusions



US Exclusion Portfolio

Panel B: Cumulative returns



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 |

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 |
| Adj. R ² | 0.833 | 0.800 |
| Num. obs | 126 | 73 |

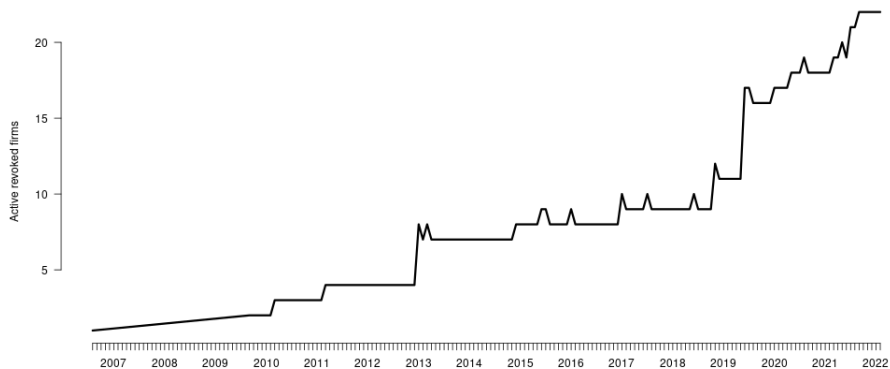
Alpha estimation for Subperiods

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 |
| Adj. R ² | 0.782 | 0.825 |
| Num. obs | 126 | 73 |

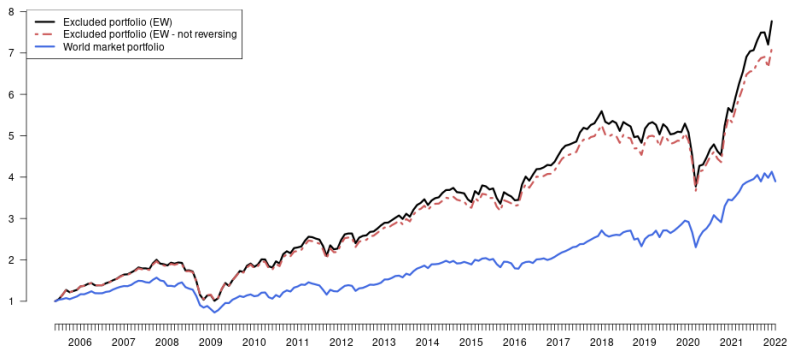
Post-Exclusion portfolio

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



Keeping the firms with exclusion revoked (EW)

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



Cumulative returns, Value Weighted portfolio

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