Performance of US Equity Mutual Funds in Different Economic Regimes

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Background

- *The debate on the appropriate role of Corporate Social Responsibility not a recent phenomenon*

  Dates back centuries

- *However, it has recently attracted a higher level of attention (due to well-publicized high-profile corruption allegations)*

  - *Practitioners &*
  - *Academics*

Earlier Work

(Strategy, Corporate Governance, Management, Business Ethics)

Historically, Two Opposing Views:

1. *CSR may or may not help other stakeholders but is not in the best interest of shareholders.*

   Friedman (1970), at least some interpretation of Jensen (2005), Jensen and Meckling (1976, 2005)

   "The only social responsibility of the manager is to serve the master (shareholder)"

2. *More normative stakeholders theorists who adopt a more critical stance towards the role of business in society. CSR is the right thing to do even if it comes at the expense of shareholders (Recent example, Paul Craig Roberts)*

   Both views imply conflict between CSR and Investor's interest

Earlier Work

(Strategic Corporate Governance, Management, Business Ethics)

Recently a converging view has emerged, recognizing a potential business case for CSR

Freeman (1984), Freeman & McVea (2001), Freeman et.al. (2004), John Roberts (2004):

"Firms are institutions created to serve human needs. It is also necessary that all the relevant interests (not just those of shareholders) are recognized and taken into account" John Roberts (2004)

"Shared Value" Porter & Kramer (2011), "Sustainable Value Creation" Fatemi & Fooladi (2013)

You can do well by doing good

Recent Work (Finance)

Research results on the business case for CSR are mixed

Higher Abnormal Return

- *Dimson, Karakas, and Li (WP 2012) (4%)*
- Fatemi, Fooladi, Wheeler (2009) (0.67%)

Lower cost of capital

- *Ge and Liu (WP 2012), El Ghoul, et al. (JBF 2011), and Plumlee, et al., (WP 2010)*

Non linear relationship

- *Barnia and Rubin (J. Bus Ethics2010)*
  - *At low levels of CSR expenditure, link between firm's value is positive, but negative beyond a certain level*
- *Goss and Roberts (JBF 2010)*
  - *Similar results with cost. Non-linear relationship on the cost of borrowing*

Recent Work (continued)

SRI portfolios outperform conventional portfolios or they do not under perform

- Statman and Glushkov (2009)
- Bauer, Koedijk, and Otten (2005)
- Leitw and Cortez (2014)
- Derwall et.al. (2011)

Recent Work (continued)

No material differences

- *Milevsky, et al. (2006)*
  - *Optimization algorithm to replace "socially undesirable stocks" from the TSX 60 with "socially responsible firms" => economically insignificant returns*
- *Zakri Bello (JFR 2005)*
  - *SRI funds do not outperform conventional ones*
- *Albuquerque, et al. (WP BU2011)*
  - *CSR firms exhibit lower systematic risk and expected returns*

Recent Work (continued)

Other reasons for the correlation

- *Meir Statman (SSRN WP 2005)*
  - *SRI indexes perform better than S&P 500 during 90s (not 2000s)*
- *Hong, et al., (NBER WP2012)*
  - *CSR activities rise with firms' performance*
  - *Firms that "do well" more likely to "do good" by engaging in CSR activities*
- *Servaes and Tamayo (Management Science 2012)*
  - *CSR activities enhance the value of the firm when they are accompanied by high public awareness*
  - *This is one reason why firms try to portray themselves as socially responsible*

Recent Work (continued)

Research results on SRI Portfolios are also mixed

Higher risk adjusted return for "sin" stocks

- Hong and Kacperczyk (2009)
- Fabozzi, Ma, and Oliphand (2008)
- Salaber (2013)

These could be considered as an evidence for underperformance of SRI funds

Recent Work (continued)

- Most studies in CSR and SRI do not distinguish between good and bad economic times
- One exception is Nofsinger and Varma (JBF2014)
- They investigate performance of socially responsible mutual funds for the period 2000-2011 and distinguish good times from the recent two financial crises.
- We investigate all bear and bull markets since 1967, applying regime switching process to capture probability of abrupt changes in macroeconomic variables.

Question We Try To Address in This Paper

- *How do SRI mutual funds perform relative to conventional funds in different economic regimes?*
- *We also checked to see how does our regime switching process predict future bear and bull markets.*

The Model

- *We assume fund returns depend on economic regimes that are characterized by a hidden Markov Chain.*
- *The regime switching process intends to determine the nature of link between abrupt changes in Macroeconomic variables and asset prices by considering the probability of transition from one regime at time t – 1to anther at time t.*

The Model

Hamilton (2005):

- "complete description of the probability law governing the observed data would then require a probabilistic model of what caused the change"
- $F_t = \alpha_{Mt} + \beta_{Mt} F_{t-1} + \gamma_{Mt} \varepsilon_t$ (1)
- $F_t = (F_{t1}, F_{t2}, \cdots, F_{tj})$ denote the a set of macroeconomics indicators that follow a vector autoregressive process (VAR)
- α_{Mt}, β_{Mt}, and γ_{Mt} are regime dependant

The Model

We assume there are *M* discrete regimes, which follow a first-order K-state stationary Markov chain with the following probability transition matrix:

$$P = \begin{bmatrix} p_{11} & p_{12} & \cdots & p_{1K} \\ p_{21} & p_{22} & \cdots & p_{2K} \\ \cdots & \cdots & \cdots & \cdots \\ p_{K1} & p_{K2} & \cdots & p_{KK} \end{bmatrix}$$

where $Pr(M_t=j|M_{t-1}=i, M_{t-2} = k, ...) = Pr\ (M_t = j|M_{t-1} = i)=p_{ij}$

conditional probability of transferring from regime i at time t-1to regime j at time t.

Seven macroeconomic indicators that drive the dynamics of the market regimes

- S&P500 Price Index (STX),
- U.S. Credit Spread (UCS),
- Treasury Yield Spread (TYS),
- Consumer Confidence Index (CCI),
- Leading Economic Index (LEI),
- Consumer Price Index (CPI) and
- U.S. Industrial Production Index (MIP).

Optimum Number of Regimes

- Applying “Bayesian Information Criterion” find out that the optimum number of regimes for our data is two regimes with the following transition matrix:

$$P = \begin{bmatrix} 0.9173 & 0.0827 \\ 0.0343 & 0.9657 \end{bmatrix}$$

Asset Pricing Models

- *CAPM*
- *3-factor Fama-French*
- *4-Factor Fama-French (Carhart)*
- *5-Factor Fama-French*

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{M_t}(R_{mt} - R_{ft}) + \varepsilon_t$$

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,Mt}\,(R_{mt} - R_{ft}) + \beta_{2,Mt}SMB_{t-1} + \beta_{3,Mt}HML_{t-1} + \varepsilon_t$$

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,Mt}\,(R_{mt} - R_{ft}) + \beta_{2,Mt}SMB_{t-1} + \beta_{3,_{Mt}}HML_{t-1} + \beta_{4,Mt}MOM_{t-1} + \varepsilon_t$$

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,Mt}\left(R_{mt} - R_{ft}\right) + \beta_{2,Mt}SMB_{t-1} + \beta_{3,Mt}HML_{t-1} + \beta_{4,Mt}RMW_{t-1} + \beta_{5,Mt}CMA_{t-1} + \varepsilon_t$$

Data

- CRSP survivorship bias-free monthly data on US Mutual Funds and ETF
- list of 240 US equity mutual funds in the SRI category from Nofsinger and Varma (2014)
- identified 56860 funds in the CRSP database, including 235 of our list of 240 SRI Mutual funds

Data

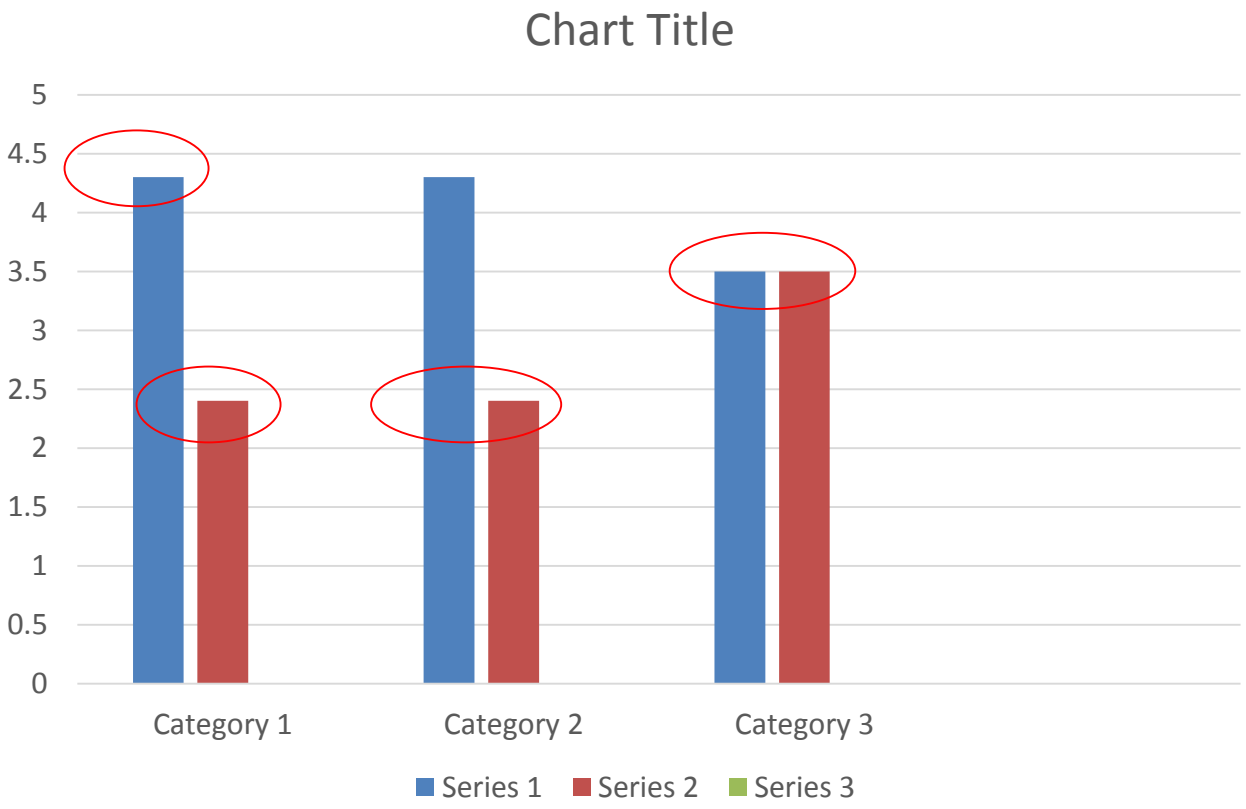
	Full period	1967.3	2000.1	2006.1	2010.1	2011.1	2014.1
# Fund	235	1	71	106	176	179	159
TNA		NA	7158.1	23139	22420	26661	49454
Fund type(#of funds)							
Non-indexed	185	0	59	80	140	147	128
index-based	19	1	7	8	11	11	11
ETF Pure index based	12	0	0	2	11	7	6
Non-ETF Pure index based	16	0	2	13	11	11	11
Index Fund enhanced	3	0	3	3	3	3	3

Matching criteria

- *Type (open versus close fund)*
- *Objective code*
- *Classification code*
- *Total net asset value*
- *Three ways to compare TNA*

For every SRI fund, we pick three companies based on the first three criteria that have closest amount of asset under management. We repeat that three times with three different approaches.

Criteria For Matching TNA



Test Results

1. *For each SRI fund and their matches, we find abnormal returns based on CAPM, Fama-French 3-factor, 4-factor (Carhart) and 5-factor models.*
2. *We calculate equally-weighted and Value weighted average of these abnormal returns for SRI funds and for each of their matches*
3. *Compare the average SRI abnormal return with the best match and the average of the three matches*

Sample Results: AVG Abnormal Return Matching Based on Last year TNA

Panel a: Equally Weighted				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.0651	-0.0825	-0.1795	-0.23911
Best Matching	-0.2947***	-0.2411**	-0.2837**	-0.3339*
Average 3 Matches	-0.212***	-0.1931**	-0.2604**	-0.3534**
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.1417	-0.1146	-0.1475	-0.1075
Best Matching	-0.2099*	-0.192**	-0.1866	-0.1794**
Average 3 Matches	-0.1737	-0.146	-0.1423	-0.1332
Panel b: Value Weighted,				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	0.0666	-0.0397	-0.1065	-0.137
Best Matching	-0.0562	-0.0458	-0.1531*	-0.1193
Average 3 Matches	-0.0208	-0.037	-0.1349	-0.1452
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.0684	-0.0452	-0.0361	-0.0399
Best Matching	-0.0229	-0.0339	-0.0387	-0.0217
Average 3 Matches	-0.0554**	-0.059	-0.0576	-0.0469

Sample Results: AVG Abnormal Return Matching Based on Equal Lives

Panel a: Equally Weighted				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.0603	-0.0791	-0.1530	-0.2412
Best Matching	-0.0362	-0.0577	-0.1624	-0.2808
Average 3 Matches	-0.0271	-0.0692	-0.1672	-0.2356
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.1327	-0.1111	-0.1082	-0.1059
Best Matching	-0.1350	-0.1246	-0.1195	-0.1002
Average 3 Matches	-0.1367	-0.1301	-0.1222	-0.1099
Panel b: Value Weighted,				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	0.2114	0.1198	0.0935	-0.0142
Best Matching	0.0534	0.0037	-0.0572*	-0.1297*
Average 3 Matches	0.0398**	0.0075	-0.0663	-0.0912
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	0.0018	-0.0051	0.0119	-0.0373
Best Matching	-0.0480*	-0.0749**	-0.0674**	-0.0901**
Average 3 Matches	-0.0319	-0.0518	-0.0440	-0.0646

Summary of Results

1. *Regardless of the asset pricing model used, both SRI and their matches underperform their benchmarks, except a value-weighted portfolio of SRI fundsthat over perform CAPM benchmark*
2. *SRI funds do either better or the same as conventional funds regardless of whether we measure the equally-weighted or value-weighted average.*
3. *The difference is more pronounced in bear markets.*
4. *Comparing by equally-weighted averages show a slightly higher difference in abnormal returns for SRI funds relative to conventional funds that comparing by value-weighted average.*
5. *For other matching approaches the results are more or less the same with minor differences.*

Summary of Results

1. *When we match TNA based on the last year of SRI funds the results are almost identical*
2. *When we find matches based on equal lives results are more or basically the same but less pronounced*

Bear and bull markets as identified by the NBER

- *To test our regime switching approach, we also conducted our tests of abnormal returns using bear and bull markets as identified by NBER.*
- *Our predicted bull and bear markets have over 94% overlap with those of NBER*
- *The results confirms our previous findings with all three matching approaches, which is not a surprise, given 94% overlap.*

Sample Results: AVG Abnormal Return Matching Based on Last year TNA, NBER

Panel a: Equally Weighted				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	0.0965	-0.0248	-0.2149	-0.1525
Best Matching	-0.0499*	-0.0323	-0.2008	-0.3692**
Average 3 Matches	-0.0337*	-0.0801	-0.6253**	-0.3457**
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.1554	-0.1293	-0.1282	-0.1186
Best Matching	-0.2145*	-0.1851*	-0.1923**	-0.1766*
Average 3 Matches	-0.1755	-0.1392	-0.1450	-0.1305
Panel b: Value Weighted				
Bear Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	0.1802	0.0137	-0.0848	-0.1288
Best Matching	0.0319	0.0240	-0.2546	-0.1900
Average 3 Matches	0.0756*	0.0270	-0.1815	-0.1450
Bull Regime				
Average	CAPM	3-factor	4-factor	5-factor
SRI	-0.0735	-0.0476	-0.0364	-0.0416
Best Matching	-0.0259	-0.0308	-0.036	-0.0199
Average 3 Matches	-0.0592**	-0.0552*	-0.0569	-0.0433*

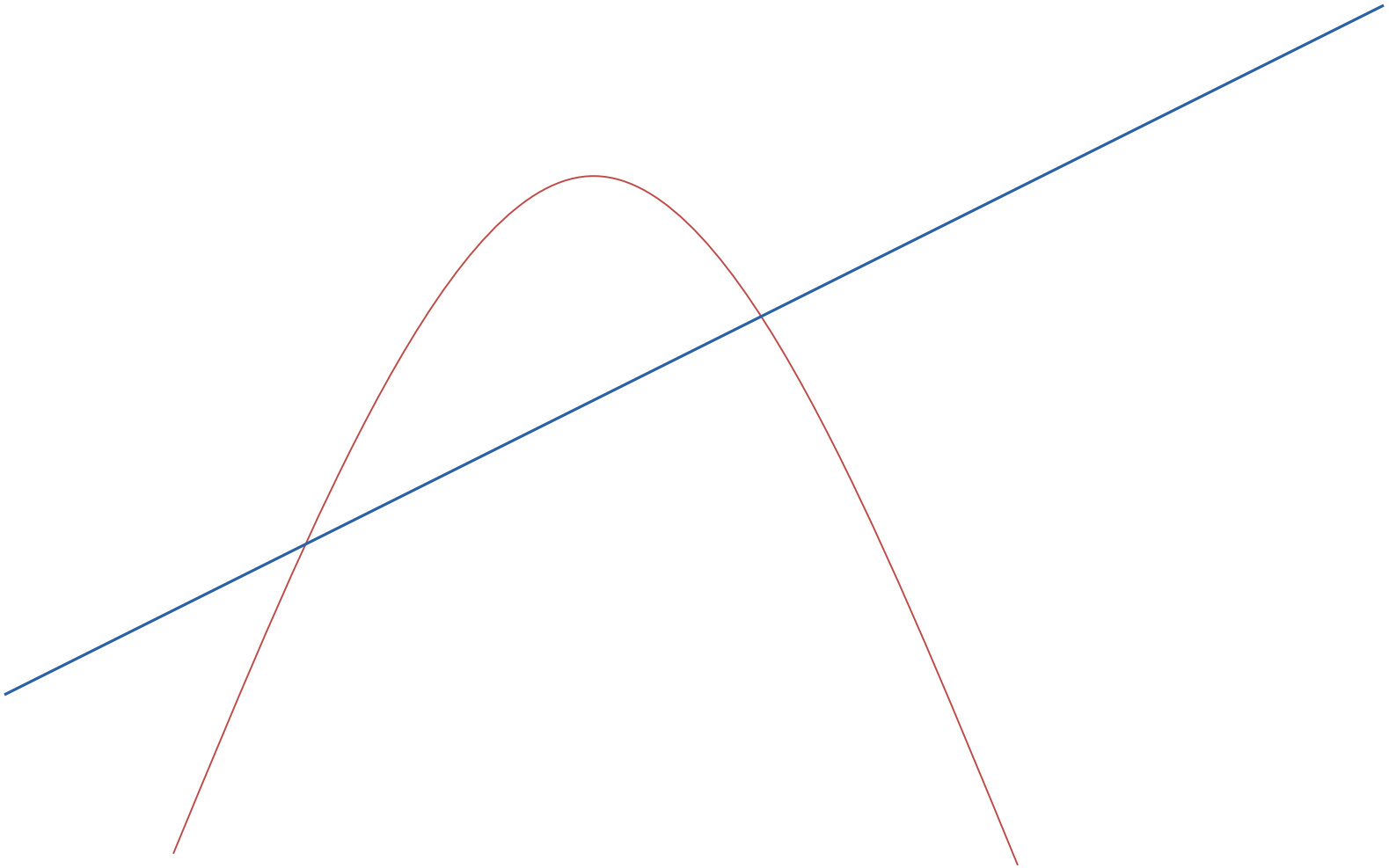
Concluding remarks

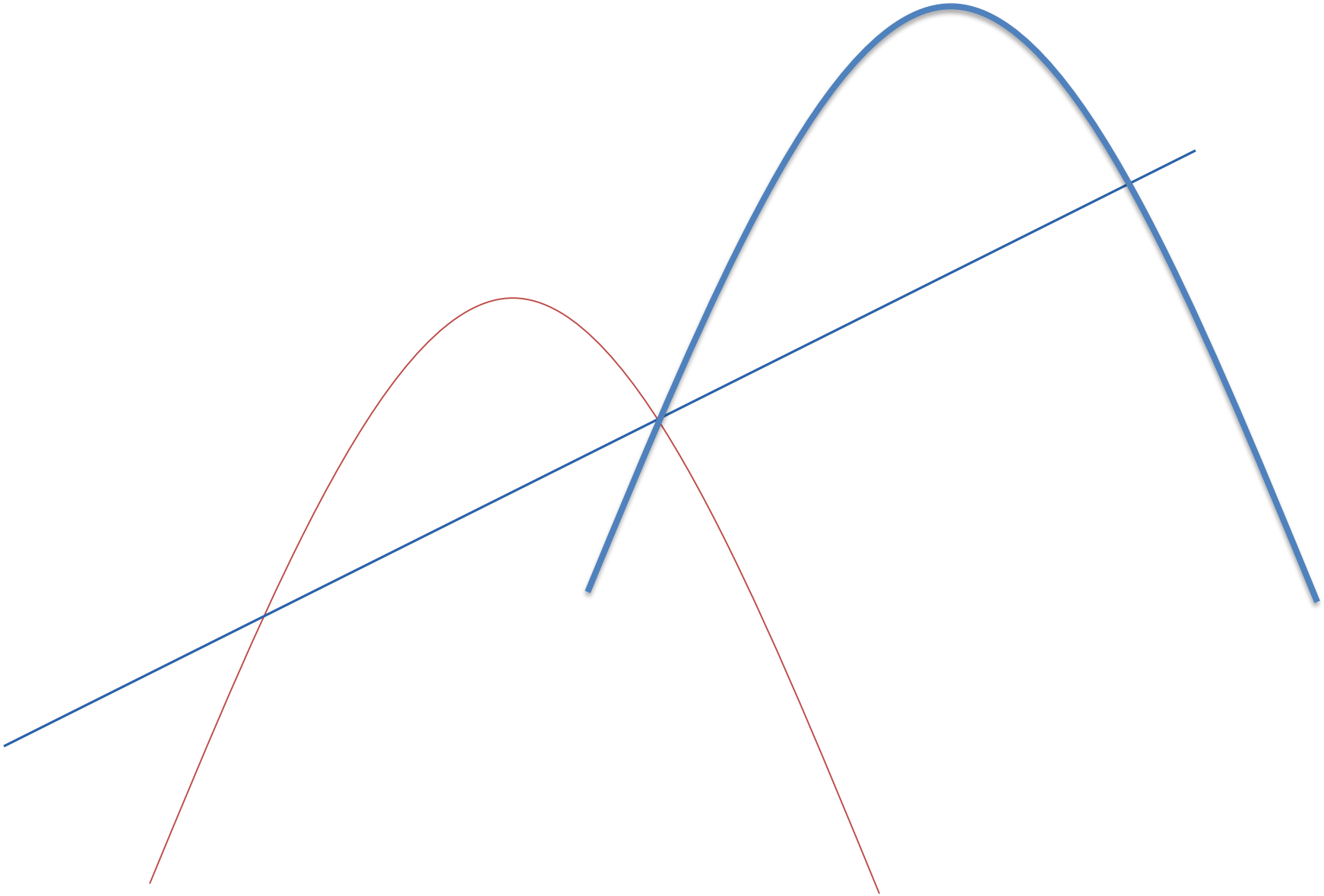
- *Although (as we did in this paper and earlier publications) one can offer logics as to why firms that constrain themselves to be socially responsible could create higher profits, in an efficient market, it is hard to offer similar logics for portfolios and explain why fund managers who constrain themselves to just pick CSR firms do better.*
- *This is because the higher profits will make SRI firms more expensive.*
- *Also, "conventional managers" have a larger set of choices.*

Concluding remarks

- *Nevertheless, our results show the SRI mutual funds often do better or the same as conventional funds in both bear and bull markets.*
- *The degree of overperformances (sometimes) depends on the asset pricing model used to measured abnormal returns.*
- *These results do not change, when we use bear and bull markets as identified by the NBER*

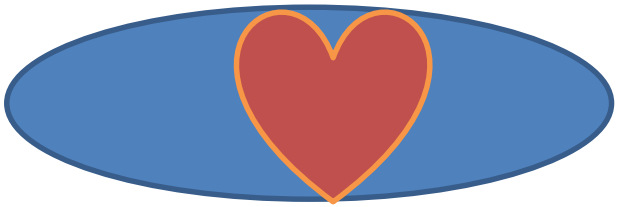
- *Is the "turnover" answer to our question?*
- *Could it be "managers' skill"?*





A Related Questions: Funds' Return

- *Can an investor form a portfolio of socially responsible firms and have a better performance than investors without this constraint who have a broader selection base that also include SRI stocks? Are we comparing apple with apple?*



- *Could the potential outperformance be attributed to other factors?*

Thank You