

Does investors' valuation of corporate environmental activities vary between developed and emerging market firms?

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Abstract

We compare the market reactions of developed and emerging market firms to reconstitutions of the FTSE Environmental Opportunities (FTSE EO) index. Our primary finding is that developed market firms that were added to or deleted from the FTSE EO experience significant increases in stock prices and trading volumes even after controlling for institutional ownership and size effects. In contrast, emerging market firms experience declines in both stock prices and trading volumes.

Keywords: Environmental sustainability; FTSE EO; Event study; Abnormal return; Trading volume; Institutional ownership.

JEL Classification: G11 · G12 · G14 · Q50 · Q56

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1. Introduction

Do investors' valuations of corporate environmental activities differ between developed and emerging market firms? To address this question, we examine the changes in stock prices, trading volumes, and institutional ownerships of developed and emerging market firms that were added to or removed from the FTSE Environmental Opportunities (EO) index during the period from 2009 to 2019.

We select the FTSE EO index for four reasons. First, the FTSE EO index consists of firms from both developed and emerging countries that are involved in environmental markets thereby allowing for cross-country comparison.¹ Second, in contrast to the long-studied Dow Jones Sustainability World Index, firms themselves do not provide any input data for membership in the FTSE EO thereby avoiding any self-selection bias. Third, compared to the majority of other sustainability indexes, addition to or deletion from the FTSE EO sends a clearer signal about a firm's commitment to environmental activities, because it is based on specific criteria, rather than best-in-class screening. Fourth, the FTSE EO is transparent and publicly available. The FTSE Russell publicly announces changes and publishes the latest index membership list.

We find that firms in developed markets which were added to or deleted from the FTSE EO experience significant increases in stock prices and trading volumes. Moreover, these

¹ The countries examined in this study cover a major segment of developed and emerging market economies. The developed market economies consist of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, the United Kingdom (UK), and the United States (US), while the emerging market economies are Brazil, Chile, China, Greece, India, Indonesia, Korea, Malaysia, Mexico, the Philippines, Russia, Taiwan, Thailand, Turkey, and the United Arab Emirates (UAE).

increases remain significant even after controlling for institutional ownership and size effects. In contrast, emerging market firms show declines in both stock prices and trading volumes.

2. Literature review

A common approach to examining the impact of corporate social responsibility (CSR)-related practices on shareholder value is to assess the reactions of share prices to news about firms whose membership status in a CSR or sustainability index changes.² The literature, however, focuses mainly on U.S. and European markets and reports inconsistent findings. For example, whereas Robinson et al. (2011) find a permanent price gain for U.S. companies that are added to the Dow Jones Sustainability World Index, Cheung (2011) reports only a temporary stock price reaction. In contrast, Doh et al. (2010) and Becchetti et al. (2012) find a marginal or no price reaction for U.S. companies that are added to the Calvert Social Index and Domini 400 Social Index, respectively. Similarly, Consolandi et al. (2009) find gains (losses) in stock prices for European firms that are added to (deleted from) the Dow Jones Sustainability Stoxx Index, whereas Lackmann et al. (2012) find a price change for deletions only. In contrast, Curran and Moran (2007) and Clacher and Hagendorff (2012) do not observe any strong reactions in the stock prices of UK firms that are added to or deleted from the FTSE 4Good UK 50 and the FTSE 4Good Index, respectively.

As other studies have largely focused on developed markets, such as the U.S. and Europe, and offer limited or no cross-country comparisons, we are particularly interested in comparing how investors value corporate environmental activities of developed versus emerging market

² CSR indexes – also known as sustainability indexes – typically include (exclude) companies that are considered to have “good” (“bad”) environmental and social practices. The first CSR index, the *Domini 400 Social Index*, was created in 1990. Since then, several indexes have emerged such as the *Dow Jones Sustainability Index* that was created in 1999, the *Calvert Social Index* in 2000, the *FTSE4Good* in 2001, the *Morningstar Socially Responsible Index* in 2003, and the *FTSE Environmental Opportunities All Share Index* in 2008, among others.

firms. The international context of our study is important for at least three reasons. First, the literature argues that a global North-South “CSR divide” accounts for the differences that are evident between developed markets and emerging markets in terms of the conceptualization and approaches to CSR engagement (Gugler and Shi, 2009). More recent studies support this view and emphasize that indeed “there is a gap in social ideology and the perception of CSR in developed and developing countries” (Ullah and Sun, 2021 p. 1067). Several empirical studies also lend credence to this idea. For example, the results of Shen and Chang (2006), Soana (2011) and Wu and Shen (2013) suggest that banking firms in different geographic regions exhibit different relationships between CSR and financial performance (see also Chen et al., 2018; Finger et al., 2018). This variation may be attributed to country economic heterogeneity or differences in the level of national economic development (Jamali and Mirshak, 2007; Jones, 1999; Wu and Shen, 2013). Second, despite calls to account for such differences (Wu and Shen, 2013), comparative empirical studies on the effect of environmental responsibility on firm performance in developed versus emerging markets have generally remained limited (Finger et al., 2018). Third, our sample includes firms from emerging markets that extends the scant literature on market reactions to corporate environmental performance in those contexts (Ullah and Sun, 2021).

3. Sample

In June 2008, the global index company, the FTSE Group, launched the FTSE EO All-Share index that consists of firms that have a significant involvement in environmental markets and technologies. To be eligible for inclusion in the index, firms need to have at least 20% of their business derived from environmental business activities, which includes the seven

environmental sectors: Renewable and Alternative Energy, Energy Efficiency, Water Infrastructure and Technologies, Waste Management and Technologies, Pollution Control, Environmental Support Services, and Food, Agriculture and Forestry.³

Membership of the FTSE EO index is reviewed twice a year, in June and December, using data at the close of business on the Monday four weeks before the effective date.

Therefore, we consider three event days: the qualification day (QD) is the day at the end of which market data used to determine changes in index constituents become available; the announcement day (AD) is the day of the actual announcement of index constituent changes; and the effective day (ED) is the first trading day when index changes become effective. While the period between QD and ED has remained constant at 20 trading days, AD preceded ED by 6 trading days until December 2013, and by 11 trading days since then.

Our sample period starts with the first review in June 2009 and extends to December 2019. We use the *FTSE Russell Environmental Opportunities Index Series Review* announcements to identify 371 (152) firms from 22 developed and 15 emerging markets⁴ that entered (exited) the FTSE EO index during that period. This initial sample is reduced to a final, clean sample of 264 developed market firms (190 additions and 74 deletions) and 132 emerging market firms (99 additions and 33 deletions) after an application of six screens.⁵

³ The assessment to establish whether a business is included or excluded from the FTSE EO Index is carried out by independent research analysts based on the FTSE Environmental Markets Classification System, which includes the seven environmental sectors. The passing of the 20% threshold is normally determined through independent analysis of the following parameters: (i) environmental market revenues against total revenues, (ii) environmental market invested capital against total invested capital, and, (iii) environmental market EBITDA against total EBITDA. Companies' activities only count towards their environmental market percentage if the environmental market revenue or environmental market EBITDA is contained within their consolidated report and accounts. Environmental market invested capital is analysed using the book value for invested capital.

⁴ MSCI market classification is used to define developed and emerging markets: <https://www.msci.com/market-classification>.

⁵ The first screen removed 53 developed market firms (26 additions and 27 deletions) and 15 emerging market firms (8 additions and 7 deletions) that were simultaneously added to or deleted from both FTSE EO and FTSE EO 100 indexes. The second screen removed 10 US firms (8 additions and 2 deletions) that are classified as non-US firms according to the Institutional Brokers' Estimates System International, Inc. (I/B/E/S) country code. The third screen

Taken together, we analyze the following four groups of developed and emerging market firms:

1. Developed market additions consist of 190 firms from 22 developed markets added to the FTSE EO for the first time.
2. Emerging market additions consist of 99 firms from 15 emerging markets added to the FTSE EO for the first time.
3. Developed market deletions comprise 74 firms from 17 developed markets removed from the FTSE EO for the first time.
4. Emerging market deletions comprise 33 firms from 11 emerging markets removed from the FTSE EO for the first time.

Table 1 summarizes the distribution of these firms by country.

[Table 1 about here]

4. Analyses

4.1. Abnormal returns

To examine and compare abnormal returns of developed and emerging market firms around FTSE EO index changes, we use a market model with a pre-event estimation period of 180 days from QD–210 to QD–31. Following Campbell et al. (2010), we use national value-

removed 6 developed market deletions that were excluded from the FTSE EO index following corporate spin-offs. The fourth screen removed 1 developed market firm (addition) and 5 emerging market firms (4 additions and 1 deletion) that were added to or removed from the index for the second time. Finally, the fifth screen removed 3 Chinese firms that were added as American Depository Receipts to the FTSE EO index and the only 3 Chinese firms (2 additions and 1 deletion) that were not traded in Hong Kong. Finally, to avoid confounding effects between developed (Hong Kong) and emerging (China) markets, the sixth screen removed all 31 Hong Kong firms (30 additions and 1 deletion), as they had headquarters or significant business operations in China.

weighted market-index returns in local currencies as proxies for the market returns of the respective countries.⁶

Panel A of Table 2 shows the abnormal returns for developed and emerging market firms added to the FTSE EO. Both groups experience significant and negative cumulative abnormal returns (CARs) in the 30-day period prior to QD. The developed market additions show an abnormal gain of 1.01% from QD–1 to QD+1. This gain is significant and indicates investors' anticipation of index changes. By contrast, the emerging market additions do not show any significant CARs around QD. However, they experience significant negative CARs of –0.63% and –0.75% on AD+1 and ED, respectively.

[Table 2 about here]

Panel B of Table 2 shows that developed market deletions have an abnormal gain of 1.02% from QD–1 to QD+1. Like additions, emerging market deletions do not experience any significant CARs from QD–1 to QD+1. Overall, this analysis shows that the stock prices of developed and emerging market firms behave differently.

4.2. Trading volume

To increase the power of the tests to detect market reaction, we analyze trading volume by following procedures similar to those in Chae (2005). Table 3 presents the abnormal trading volume for developed and emerging market firms added to (Panel A) or deleted from (Panel B) the FTSE EO. Panel A shows that the trading volume of developed market additions increases significantly on ED–2 and reaches its peak of 3.75%, which is significant at the 1% level under all three tests on ED–1. This pattern can be explained by the trading behavior of index fund

⁶ We obtain all security and market data required for the abnormal returns and the following analyses from the Thomson Reuters Datastream database. To estimate the significance of abnormal returns, we use a parametric *t*-test and two nonparametric tests: a sign test (Corrado and Zivney, 1992; Cowan, 1992) and a rank test (Corrado, 1989).

managers who delay their trades until ED–1 to minimize tracking errors.⁷ In contrast, emerging market deletions experience significant decreases in trading volume. The largest declines of –1.88% and –2.13% occur on AD+1 and ED+2, respectively.

[Table 3 about here]

The trading volumes of deletions in Panel B are similar. Specifically, developed market deletions show the largest increase of 2.86% on ED–1, which is significant at the 1% level under a *t*-test and rank test, whereas emerging market deletions have significant decreases in trading volume.

Consistent with the abnormal return analysis, this analysis provides additional evidence of the difference in market reactions between developed and emerging market firms. Specifically, developed market firms show significant gains around QD and significant increases in trading volume around ED. By contrast, emerging market firms have neither significant returns nor significant trading volumes on those days.

4.3. Institutional ownership

To examine if the observed differences in abnormal return and trading volume can be related to differences in institutional ownership, we compare changes in institutional ownership around the FTSE EO index reconstitution between developed and emerging market firms.⁸ Similar to Biktimirov and Li (2014) and Shankar and Miller (2006), we calculate the mean

⁷ Similar trading behavior is documented around reconstitutions of other indexes, such as S&P 500 (Kappou et al., 2010; and Geppert et al., 2011), Nasdaq 100 (Biktimirov and Xu, 2019a), Dow Jones Industrial Average (Biktimirov and Xu, 2019b), and FTSE EO 100 (Biktimirov and Afego, 2021).

⁸ The percentage of strategic share holdings of at least 5% held by investment banks or institutions and the total percentage of strategic holdings of at least 5% owned by government, institutions, individuals and foreign entities are obtained from Thomson Reuters Datastream database. Sample is reduced for the total percentage of strategic holdings due to missing data for some firms.

percentage of institutional ownership over the two months before and after the month of the index change to test for significant differences.

Table 4 presents some descriptive statistics and test results for the percentage of strategic share holdings owned by investment banks and the total percentage of strategic holdings for additions to and deletions from the FTSE EO for the period from 1999–2019. As shown in Panel A, prior to index changes, the mean (median) of 7.35 (5.00) percentage of strategic shareholdings held by investment banks or institutions for developed market firms is six times as large as the mean (median) of 1.23 (0.00) percentage for emerging market additions. Although developed market additions show a 0.45% increase in the percentage of strategic shareholdings held by investment banks or institutions, it is only significant at the 8% level under the *t*-test.

[Table 4 about here]

The mean (median) of 30.08 (24.00) total percentage of strategic shareholdings for developed market firms is about 50% smaller than the mean (median) of 44.65% (44.50%) for emerging market additions. Neither developed nor emerging market additions show significant changes in the total percentage of strategic shareholdings.

Panel B shows that the mean of 5.14% of strategic shareholdings held by investment banks or institutions for developed market deletions is two times larger than the one for emerging market deletions. The percentage of strategic shareholdings by investment banks or institutions and the total percentage of strategic shareholdings show an increase of 0.79 and 0.77%, respectively, but these increases are significant at the 10% level only under one test. Emerging market deletions do not show any statistically significant changes in strategic shareholdings around the index changes.

A growing number of studies suggest a connection between size and CSR activities (e.g., Baumann-Pauly, 2013; Drempetic et al., 2020). Therefore, we also compare the sizes of developed and emerging market firms by using three proxies: market value, sales, and total assets.⁹ Not presented here to save space, we find that the market value and total sales of developed market firms are significantly larger than those of emerging market firms.

4.4. Regression analysis

To examine if the differences in abnormal returns and trading volume around QD and ED, respectively, between developed and emerging market firms still remain in the presence of institutional ownership and firm size as controlling factors, we run cross-sectional regressions of CARs and CAVs on two dummy variables. They are equal to one if a firm is from a developed market or an index addition, respectively, and zero otherwise. As controls, we use the pre-event percentage of strategic shareholdings held by investment banks or institutions; the change in the percentage of strategic shareholdings held by investment banks or institutions; and three proxies for firm size: market value, sales, and total assets.

To allow for different proxies for firm size, Table 5 presents six regressions. Positive coefficients for the developed market dummy, which are significant at least at the 5% level in all regressions, indicate significantly larger gains in stock prices and trading volumes for developed market firms even after controlling for institutional ownership and size factors.

[Table 5 about here]

⁹ Dang et al. (2018) find that different measures capture different facets of firm size. All three proxies are collected from the Thomson Reuters Datastream database for day QD-30.

5. Conclusion

A growing body of literature examines how CSR activities effect firm value. However, the reported results are inconsistent and focus mainly on North American and European countries. This study finds significant differences in the market reactions to changes to the FTSE EO between developed and emerging market firms. Both added and deleted developed market firms experience increases in stock prices and trading volumes around the qualification day and around the effective day, respectively. In contrast, emerging market firms show decreases in stock prices and trading volumes. We also find that developed market firms are bigger in size and have larger institutional ownership by investment banks. As a limitation, however, this study does not examine why developed market firms deleted from the index still gain in value. This question is left for future research.

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Table 1

Country distribution of additions to and deletions from the FTSE EO

Panel A: Developed markets				
Country	Additions		Deletions	
	Number of firms	Percent	Number of firms	Percent
Australia	10	5.3%	5	6.8%
Austria	1	0.5%	1	1.4%
Belgium	2	1.1%	2	2.7%
Canada	11	5.8%	1	1.4%
Denmark	2	1.1%	0	0.0%
Finland	1	0.5%	3	4.1%
France	3	1.6%	2	2.7%
Germany	5	2.6%	2	2.7%
Israel	1	0.5%	0	0.0%
Italy	4	2.1%	2	2.7%
Japan	29	15.3%	13	17.6%
Netherlands	7	3.7%	1	1.4%
New Zealand	2	1.1%	0	0.0%
Norway	3	1.6%	0	0.0%
Portugal	0	0.0%	0	0.0%
Singapore	7	3.7%	2	2.7%
Spain	3	1.6%	3	4.1%
Sweden	5	2.6%	1	1.4%
Switzerland	7	3.7%	3	4.1%
UK	12	6.3%	5	6.8%
USA	75	39.5%	28	37.8%
Total	190	100%	74	100%
Panel B: Emerging markets				
Brazil	8	8.1%	1	3.0%
Chile	3	3.0%	1	3.0%
China	26	26.3%	5	15.2%
Greece	1	1.0%	2	6.1%
India	9	9.1%	7	21.2%
Indonesia	1	1.0%	0	0.0%
Malaysia	5	5.1%	2	6.1%
Mexico	1	1.0%	0	0.0%
Philippines	4	4.0%	1	3.0%
Russia	2	2.0%	1	3.0%
South Korea	10	10.1%	9	27.3%
Taiwan	21	21.2%	3	9.1%
Thailand	6	6.1%	0	0.0%
Turkey	1	1.0%	0	0.0%
UAE	1	1.0%	1	3.0%
Total	99	100%	33	100%

Table 2

Average cumulative abnormal returns (CARs) for firms added to or deleted from the FTSE EO

Panel A: Additions

	Developed market firms ($N = 190$)				Emerging market firms ($N = 99$)			
	CARs (%)	t test	Rank test	Sign test	CARs (%)	t test	Rank test	Sign test
QD-30, QD-1	-4.00	-3.87***	-2.54**	-2.97***	-5.06	-3.79***	-1.69*	-2.95***
QD-2	-0.11	-0.59	-1.27	-1.52	-0.21	-0.88	-0.92	-0.52
QD-1	0.33	1.74	1.26	1.53	0.05	0.22	1.17	0.89
QD	0.69	3.65***	1.98**	1.53	0.09	0.36	-0.01	-0.32
QD+1	-0.01	-0.05	-0.37	0.22	-0.11	-0.46	0.27	0.28
QD+2	-0.06	-0.33	0.15	-0.07	-0.05	-0.22	-0.44	-1.13
QD-1, QD+1	1.01	3.08***	1.66*	2.54***	0.03	0.07	0.83	0.08
AD-2	-0.23	-1.22	-0.83	-0.66	-0.43	-1.75*	-1.69*	-2.13**
AD-1	-0.35	-1.85*	-1.10	-0.81	0.40	1.65*	0.80	-0.52
AD	0.01	0.06	0.81	0.79	-0.08	-0.32	0.01	-0.92
AD+1	-0.32	-1.72*	-0.66	0.21	-0.63	-2.61***	-1.71*	-1.93*
AD+2	0.10	0.53	1.29	1.23	-0.31	-1.29	-0.86	-0.52
AD-1, AD+1	-0.66	-2.03**	-0.55	-0.23	-0.31	-0.74	-0.52	-0.72
ED-2	-0.23	-1.19	-0.71	0.05	-0.19	-0.79	-0.87	-1.32
ED-1	0.13	0.67	-0.13	0.19	0.29	1.20	1.09	1.29
ED	-0.11	-0.60	-1.39	-1.98**	-0.75	-3.08***	-3.29***	-3.94***
ED+1	-0.07	-0.39	-0.64	-1.84*	0.06	0.25	0.63	0.29
ED+2	0.08	0.42	-0.01	-1.55	0.29	1.19	1.04	0.89
ED-1, ED+1	-0.06	-0.18	-1.25	-0.39	-0.40	-0.94	-0.91	-0.52
ED+1, ED+30	-1.14	-1.10	-0.56	-0.24	-2.75	-2.06**	-0.43	-0.52
QD, QD+5	1.25	2.70***	1.16	1.53	0.04	0.06	-0.06	-1.13
QD, QD+10	0.55	0.88	-0.15	1.24	0.30	0.37	0.66	0.69
QD, QD+20	0.91	1.05	0.42	1.38	-2.00	-1.79*	-1.27	-0.93
QD, QD+30	1.05	1.00	0.62	1.53	-1.71	-1.26	-0.07	0.28
QD-30, QD+50	-4.28	-2.52**	-1.70*	-2.39**	-10.83	-4.94***	-2.06**	-3.36***

Panel B: Deletions								
	Developed market firms ($N = 74$)				Emerging market firms ($N = 33$)			
	CARs (%)	t test	Rank test	Sign test	CARs (%)	t test	Rank test	Sign test
QD-30, QD-1	1.44	0.74	-0.24	-0.48	4.86	1.72*	1.72*	0.79
QD-2	-0.54	-1.51	-1.80*	-2.12**	-0.53	-1.02	-0.28	-0.96
QD-1	0.42	1.19	0.92	0.22	0.38	0.74	0.02	-0.61
QD	0.30	0.83	1.09	1.62	1.13	2.19**	0.32	0.44
QD+1	0.30	0.83	0.85	-0.25	-0.19	-0.37	-0.29	-1.31
QD+2	-0.04	-0.11	0.13	-0.48	0.02	0.03	-0.03	0.44
QD-1, QD+1	1.02	1.65*	1.65*	0.69	1.33	1.48	0.03	1.14
AD-2	-0.07	-0.19	-1.46	-1.92*	-0.77	-1.49	-1.88*	-1.94*
AD-1	0.55	1.56	1.73*	0.89	0.75	1.45	-0.91	-2.29**
AD	0.05	0.13	1.02	0.89	-0.43	-0.82	-1.04	-0.89
AD+1	0.31	0.88	2.27**	0.66	0.26	0.50	1.23	-0.19
AD+2	0.48	1.37	0.59	0.19	-0.56	-1.09	-1.81*	-1.94*
AD-1, AD+1	0.90	1.48	2.90***	1.59	0.58	0.65	-0.41	0.16
ED-2	0.03	0.08	-0.09	-0.59	-0.50	-0.98	0.53	0.54
ED-1	0.19	0.53	-0.55	-0.59	-0.36	-0.70	-0.95	-0.85
ED	0.23	0.65	0.00	-0.36	-0.96	-1.85*	0.19	0.54
ED+1	0.18	0.52	0.98	0.57	0.11	0.21	1.21	0.54
ED+2	0.55	1.56	1.12	0.81	-0.23	-0.45	-0.88	-0.51
ED-1, ED+1	0.60	0.98	0.25	1.04	-1.21	-1.35	0.26	-0.16
ED+1, ED+30	2.38	1.22	0.18	0.34	2.23	0.79	0.27	0.19
QD, QD+5	0.09	0.11	0.25	-0.95	1.21	0.95	-0.17	-0.61
QD, QD+10	1.53	1.30	1.63	1.62	1.36	0.79	-0.32	0.09
QD, QD+20	3.56	2.18	1.49	2.09**	-1.79	-0.75	-1.45	-0.96
QD, QD+30	4.83	2.44**	1.99**	1.39	-0.62	-0.22	-0.51	-0.26
QD-30, QD+50	6.53	2.04**	0.76	0.69	6.01	1.29	0.42	0.44

Notes: Abnormal returns are estimated using a market model and a 180-trading day pre-event estimation period that runs from QD - 210 to QD - 31. Datastream country value-weighted market indexes are used as proxies for the market return. QD is the qualification day (the day at the close of which market data is used to determine next index changes), AD is the announcement day (the day of the public announcement about index changes), and ED is the effective day (the first trading day when index changes become effective).

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using a two-tail test.

Table 3

Daily abnormal trading volume for firms added to or deleted from the FTSE EO

Panel A: Additions								
	Developed market firms ($N = 190$)				Emerging market firms ($N = 99$)			
	AV (%)	t test	Rank test	Sign test	AV (%)	t test	Rank test	Sign test
QD-2	0.05	0.13	-0.11	-0.15	-1.05	-1.71*	-0.70	-1.78*
QD-1	0.42	1.04	0.52	3.77***	-1.45	-2.35**	-1.16	-2.18**
QD	0.27	0.67	0.05	0.29	-1.73	-2.81***	-1.31	-1.98**
QD+1	0.80	1.99**	0.49	0.00	-0.98	-1.59	-0.49	-1.98**
QD+2	1.12	2.78***	0.91	0.29	-0.93	-1.51	-0.33	-1.58
AD-2	0.20	0.51	0.48	0.14	-0.91	-1.47	-0.50	-1.89*
AD-1	0.39	0.97	0.42	0.29	-1.50	-2.41**	-1.25	-2.29**
AD	-0.44	-1.10	-0.49	-0.44	-1.23	-1.98	-1.07	-2.89***
AD+1	0.43	1.08	0.45	0.58	-1.88	-3.03***	-1.81*	-2.69***
AD+2	0.63	1.57	0.45	0.29	-1.41	-2.27**	-1.12	-2.69***
ED-2	1.35	3.35***	1.68*	1.56	-0.98	-1.60	-0.42	-0.88
ED-1	3.75	9.31***	4.47***	6.05***	-0.98	-1.59	-0.40	-1.48
ED	0.60	1.49	0.84	0.83	-1.40	-2.26	-1.30	-2.89***
ED+1	0.12	0.29	0.24	0.98	-1.57	-2.55***	-1.56	-1.89*
ED+2	-0.44	-1.08	-0.54	-1.20	-2.13	-3.45***	-1.79*	-2.29**

Panel B: Deletions								
	Developed market firms ($N = 74$)				Emerging market firms ($N = 33$)			
	AV (%)	t test	Rank test	Sign test	AV (%)	t test	Rank test	Sign test
QD-2	1.66	2.14**	0.00	-0.74	-2.75	-2.54***	-1.18	-2.77***
QD-1	0.64	0.83	-1.65*	-1.90*	-2.37	-2.18**	-0.84	-2.42**
QD	0.19	0.25	-1.61	-2.13**	-2.64	-2.43**	-0.90	-1.36
QD+1	-0.03	-0.04	-1.14	-1.90*	-3.26	-3.00***	-1.60	-3.47***
QD+2	0.13	0.17	-1.18	-1.67*	-4.17	-3.84***	-2.24**	-4.53***
AD-2	1.86	2.50**	0.50	-0.75	-2.29	-2.09**	-1.37	-2.74***
AD-1	1.72	2.32**	0.23	-0.28	-2.35	-2.14**	-0.84	-2.74***
AD	1.98	2.66***	0.74	-0.05	-1.68	-1.53	-1.05	-3.44***
AD+1	1.11	1.49	-0.16	-1.67*	-2.33	-2.12**	-0.84	-2.38**
AD+2	0.83	1.12	-0.75	-0.98	-2.39	-2.18**	-0.72	-1.68*
ED-2	1.16	1.53	1.38	-0.11	0.08	0.08	0.50	-0.55
ED-1	2.86	3.76***	3.12***	1.52	0.07	0.06	0.86	-0.20
ED	1.76	2.31**	1.46	0.59	0.84	0.77	0.97	-0.55
ED+1	0.39	0.52	0.42	-0.11	-3.41	-3.10***	-1.73*	-3.71***
ED+2	-1.75	-2.30**	-1.77*	-1.96**	-1.03	-0.94	-0.79	-0.55

Notes: The abnormal trading volume is computed as the difference between the log turnover and average log turnover estimated from AD -210 to AD -31, where turnover is the share trading volume divided by the number of shares outstanding. QD is the qualification day (the day at the close of which market data is used to determine next index changes), AD is the announcement day (the day of the public announcement about index changes), and ED is the effective day (the first trading day when index changes become effective).

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using a two-tail test.

Table 4

Changes in institutional ownership for firms added to or deleted from the FTSE EO

Panel A. Additions							
Measure	Pre-Event	Post-Event	Change	Increases/ Decreases/ No Change	<i>t</i> test (<i>p</i> -value)	Sign test (<i>p</i> -value)	Wilcoxon signed- rank test (<i>p</i> -value)
Developed markets							
Percentage of strategic shareholdings held by investment banks or institutions (<i>N</i> = 190)							
Mean	7.35	7.80	0.45	44 / 33 / 113	1.74* (0.08)	1.14 (0.25)	1.48 (0.14)
Median	5.00	6.00	0.00				
Total percentage of strategic shareholdings (<i>N</i> = 170)							
Mean	30.08	30.52	0.44	48 / 50 / 72	1.00 (0.32)	-0.10 (0.92)	0.56 (0.58)
Median	24.00	25.50	0.00				
Emerging markets							
Percentage of strategic shareholdings held by investment banks or institutions (<i>N</i> = 97)							
Mean	1.23	1.22	-0.01	6 / 6 / 85	-0.04 (0.98)	0.00 (1.00)	-0.12 (0.91)
Median	0.00	0.00	0.00				
Total percentage of strategic shareholdings (<i>N</i> = 88)							
Mean	44.65	45.06	0.41	17 / 18 / 53	0.81 (0.42)	0.00 (1.00)	0.28 (0.78)
Median	44.50	45.25	0.00				

Table 4 continues

Table 4 continued

Panel B. Deletions							
Measure	Pre-Event	Post-Event	Change	Increases/ Decreases/ No Change	<i>t</i> test (<i>p</i> -value)	Sign test (<i>p</i> -value)	Wilcoxon signed- rank test (<i>p</i> -value)
Developed markets							
Percentage of strategic shareholdings held by investment banks or institutions (<i>N</i> = 73)							
Mean	5.14	5.93	0.79	18 / 11 / 44	1.63* (0.10)	1.11 (0.27)	1.58 (0.11)
Median	0.00	0.00	0.00				
Total percentage of strategic shareholdings (<i>N</i> = 54)							
Mean	28.80	29.57	0.77	15 / 10 / 29	1.42 (0.16)	0.80 (0.42)	1.66* (0.10)
Median	25.50	28.50	0.00				
Emerging markets							
Percentage of strategic shareholdings held by investment banks or institutions (<i>N</i> = 32)							
Mean	2.53	2.31	-0.22	4 / 3 / 25	-0.75 (0.46)	0.00 (1.00)	0.51 (0.61)
Median	0.00	0.00	0.00				
Total percentage of strategic shareholdings (<i>N</i> = 31)							
Mean	46.34	47.48	1.15	11 / 5 / 15	1.29 (0.21)	1.25 (0.21)	1.11 (0.27)
Median	49.00	49.00	0.00				

Table 5.

Regressions on cumulative abnormal return (QD–1, QD+1) and cumulative abnormal volume (ED–1, ED+1) for firms added to or deleted from the FTSE EO

	CAR (QD–1, QD+1)			CAV (ED–1, ED+1)		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.000 (0.93)	0.000 (0.99)	–0.001 (0.89)	–0.054** (0.04)	–0.046* (0.08)	–0.056** (0.04)
Developed market dummy	0.133** (0.03)	0.125** (0.04)	0.117** (0.05)	0.306*** (0.00)	0.321*** (0.00)	0.313*** (0.00)
Addition dummy	0.001 (0.98)	–0.006 (0.91)	0.003 (0.96)	–0.046 (0.40)	–0.057 (0.30)	–0.043 (0.44)
Institutional ownership						
Holdings of investment banks	0.029 (0.61)	0.026 (0.65)	0.024 (0.67)	0.125 (0.11)	0.136* (0.08)	0.123 (0.12)
Δ Holdings of investment banks	0.011 (0.86)	0.011 (0.87)	0.013 (0.84)	0.063 (0.26)	0.061 (0.27)	0.063 (0.26)
Size						
Market value	–0.080* (0.08)			0.034 (0.45)		
Sales		–0.055 (0.22)			–0.055 (0.30)	
Total assets			–0.027 (0.55)			0.040 (0.44)
<i>N</i>	383	382	382	340	339	339
<i>R</i> ²	1.9%	1.5%	1.3%	8.2%	8.4%	8.2%

Notes: The cumulative abnormal return from QD–1 to QD+1 is estimated by using a market model and a 180-trading day pre-event estimation period that runs from QD–210 to QD–31. Datastream country value-weighted market indexes are used as proxies for the market return. QD is the qualification day (the day at the close of which market data is used to determine next index changes). The cumulative abnormal volume from ED–1 to ED+1 is calculated as the difference between the long turnover and average log turnover estimated from AD–210 to AD–31, where turnover is the share trading volume divided by the number of shares outstanding. ED is the effective day (the first trading day when index changes become effective). Developed market dummy and addition dummy are equal to one if a firm is from a developed market or an index addition, respectively, and zero otherwise. Regression coefficients are standardized. Two-tailed robust *p*-values adjusted for heteroskedasticity appear in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, using a two-tail test.