

ORIGINAL ARTICLE**EVALUATION OF STOCK MARKET REACTION TO THE INCLUSION OF FIRMS IN THE ISE SUSTAINABILITY INDEX***

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Abstract

This study examines the reaction of stock markets to the inclusion of companies in the Istanbul Stock Exchange Sustainability Index (ISESI). The Event study method is used to determine whether abnormal returns were obtained or not. Daily stock returns are used for the analysis of the event study, which ran from November 4, 2014, to April 29, 2016. The event date was also the announcement date November 4, 2015. Cumulative Abnormal Returns (CAR) in these event windows other than (+2,-2) event window for the two companies are not significant. It is important that the study is carried out on the sustainability index calculated for the first time.

Keywords

ISESI, Sustainability, Sustainability Index, Event Study, Efficient Market Hypothesis

JEL Classification

G14 - Q56

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1. INTRODUCTION

After the crisis of 2008-2009, short-termism is widespread in financial markets. Funds that were previously invested in stocks have started to trade in the short term. They are also expanding their international investments. The dominance of short-term currents in financial markets has made it difficult for investors and companies to focus on long-term economic indicators. Since the sustainability index is a long-term economic indicator, financial investors have not sufficiently considered the sustainability index.

The aim of this study is to raise awareness of sustainability and its relationship to the financial markets. In addition, general sustainability and financial sustainability similarities and differences are touched briefly. The terms “Socially Responsible Investment” (SRI) and “Corporate Social Responsibility” (CSR) are explained shortly. The historical development of sustainability is examined for Turkey and some of the large industrialized countries. To understand the importance of sustainability to investors, this study attempts to assess the stock market response to the inclusion of companies in the 2016 ISE Sustainability Index using the event study method.

In the literature, general studies (Curran & Moran (2006), Oberndorfer et al. (2013)) use event studies to measure the effect of including sustainability indices. The event study methodology is a good way to explain the daily effect. This method has also been used in the literature to explain the effects of stock splits or mergers. This method is based on the efficient market hypothesis. Efficient capital markets, according to the hypothesis, reflect all available and relevant information completely and instantaneously. Fama (1970) defined three types of efficiency. For detailed information on the random walk theory and the efficient market hypothesis, see Bodie, Kane, and Marcus (2013, Chap. 8). The first type is a weak form of efficiency; this form means that historical prices or returns are not sufficient to generate excess returns. Second is the semi-strong form of efficiency; No investor can achieve an excess return with publicly available information. And the last one is strong-form-efficiency; This form states that anyone can generate excess returns from any information publicly available or not.

The concept of financial sustainability is a new term for the world. After the 1990s, this topic started to attract people’s attention. Investors started to value companies that were financially stable. Sustainable businesses are essential to the future of our world, and people should be aware of this issue. Investors should not focus on short-term gains and should encourage companies to make sustainable investments. The concept of sustainability includes not only environmental issues, but also human rights, the supply chain, banking criteria, anti-bribery, biodiversity conservation, health and safety, and a board of practice. Overall, this concept is beneficial for people and for the future of our world.

2. LITERATURE REVIEW

Sustainability is one of the important concepts used in various fields such as environment, economy, and finance. In the Sustainable Development Plan, priority is given to environmental factors when an input turns into an output in the economy’s scarce resource. Therefore, sustainable development adds additional costs to companies’ production processes. However, these costs are perceived positively by consumers and other parties. In recent years, this interplay and this dynamic in on the financial markets have been extensively studied. For instance;

Berhelot, Coulmont, & Serret (2012) aim to determine whether or not independent sustainability reports on Canadian companies listed on the Toronto Stock Exchange are being considered by capital markets. Analysis results show that the publication of a sustainability report makes sense for investors.

Wai Kong Cheung (2011) analyzes the consequences of inclusion or exclusion from the Dow Jones Sustainability World Index. The researcher uses standard event study method with two different data sets which include the announcement date and switching date. The results show a significant positive abnormal return only in the event window (AD-2, AD+2).

In addition, there are some studies that inclusion in a sustainability index is negative perception and makes negative returns that are listed in the stock market. Oberndorfer, Schmidt, Wagner, & Ziegler (2013) and, Ziegler & Schröder (2009) indicate that investors eliminate being included in such indices may impose extra costs on companies in the short run. Oberndorfer, Schmidt, Wagner, & Ziegler (2013) examine the impact of the inclusion of German companies in the Dow Jones Sustainability World Index (DJSI World) and Dow Jones STOXX Sustainability Index (DJSI STOXX) on stock performance from 1999 to 2002 using daily stock returns. To get healthier results, they apply a short-term event study approach based on a modern asset pricing model by Fama & French (1993), a three-factor model that explains excess return better than a one-factor model. In addition, they use the t-GARCH (1, 1) model. The results show that the inclusion of a sustainability stock index has a negative impact on stock performance. The German stock market punishes sustainable companies. Similar to this study, Ziegler & Schröder (2009) conducted an empirical study. They examine the determinants of inclusion in the Dow Jones Sustainability World Index (DJSI World) and the Dow Jones Stoxx Sustainability Index (DJSI Stoxx) for 16 different European companies. Panel probit models are used to estimate equations. The results show that there is an effect of firm size, which was determined by sales, and a negative effect on of financial health, which was determined by a specific criterion, such as sales and total assets.

Curran & Morran (2006) examine whether corporate social performance (CSP) is influenced by sustainability performance reputation. The event study methodology is used to study the relationship between positive and negative announcements and stock performance. The results show that inclusion or deletion from FTS4Good UK makes no significant difference.

Renneboog, Horst, & Zhang (2008) review social responsible investment (SRI) and corporate social responsibility (CSR). The authors claim that SRI has made significant strides globally over the past decade, reflecting growing investor awareness of social, environmental, ethical, and corporate governance issues. Last but not least, the authors conclude their study with very valuable recommendations. One examines the incentive structures in the SRI industry, and the second conducts additional research to understand the impact of SRI on financial institutions.

Ahern (2009) creates a benchmark study. For example, Brown & Warner (1985) selected samples at random, but Ahern selected samples in a controlled manner to determine which method is most convenient to measure the effect of inclusion indices. For this purpose, many simulations were made. The data set includes daily returns from 1965 to 2003. The final conclusion of the study is that a generalization between a random sample from Brown & Warner (1985) and a non-random sample for the event studies is inappropriate.

Corrado & Zivney (1992) examine the sign test strength used in financial event studies. The study compares the two methods of event study, the parametric t-test, and the non-parametric rank test. The aim of this study is to make a comparison among event study methods, and as a consequence of extensive investigations, authors found that the sign tests and t-tests are overshadowed rank tests.

3. FINANCIAL SUSTAINABILITY

Sustainability has become more attractive over the last 30 years. When people realize that our world's bountiful resources are not unlimited, they try to find a way to a sustainable world. This attention sensitizes people to sustainability. As they invest, they begin to be curious as to whether the company's sustainability performance is sufficient to meet thresholds for membership in a sustainability index. The popular investment trend considers not only financially satisfying, but also ethical and social well-being. The general definition of corporate sustainability is a business approach that creates long-

term shareholder value by seizing opportunities and managing risks arising from economic, environmental, and social developments.

There are two main methods available for maximizing sustainability performance and financial performance. One is negative screening, and the other is positive screening. With the negative screening method, some industries are completely excluded from the indices. However, the positive screening procedure is much more sophisticated compared to negative screening. The purpose of this perspective is to create long-term value through the application of ethical and social strategies.

In the world, the Domini 400 Social Index (DSI) was the first known sustainability index. It was launched in 1990 by the North American rating agency. Floated in September 1999, the Dow Jones Sustainability World Index (DJSWI) is the first global sustainability index. The index is internationally recognized for its gauging and unbiased structure (Wai Kong Cheung, A. (2011). After the 2000s, sustainability is becoming increasingly attractive around the world. Robecosam, EIRIS and Sustainable Society Index are some of the independent research companies that compile rankings for countries worldwide.

In Turkey, Istanbul Stock Exchange Sustainability Index (ISESI) was launched on November 4, 2014. Ethical Investment Research Services Limited (EIRIS) Company and ISE signed a contract for evaluating the listed firms on the Stock Exchange. EIRIS evaluates companies under nine main headings: Climate Change, Human Rights, Supply Chain Management, Banking Criteria, Biodiversity, Anti-Bribery, Board Practices, Environment and Health & Safety. In 2015, ISE 50 firms and 13 volunteer companies (total 63) were evaluated, and the 29 of them were included in the sustainability index.

Table 1

Distribution of Sectors Percentage in Sustainability Index

Sector	Quantity	Percentage
Automotive industry	4	14%
Beverage	2	7%
Banking sector	6	21%
Energy	2	7%
Industrial	5	17%
General retailer	1	3%
Construction	1	3%
Multiple	2	7%
Transportation	2	7%
Telecommunication	2	7%
Food	1	3%
Gas and oil	1	3%
TOTAL	29	100%

Source: ISE

4. DATA AND METHODOLOGY

The event study is a method of measuring the impact of events on stock prices. The event study methodology assumes that the financial market is sufficiently efficient to interpret the impact of new information on firms' expected future returns (Dasgupta et al., 1998).

The definition of an efficient capital market is the market where stock prices fully and instantly reflect all available and relevant information. Fama (1970) defined three types of efficiency. The first one is weak-form efficiency which historical prices or returns are insufficient to generate excess returns. The second is the semi-strong form efficiency. No investor can achieve an excess return with the publicly available information in this form. And the last is the strong efficiency; This form states

that anyone can generate excess returns from any information whether publicly available or not.

A typical event study attempts to examine return behaviour for a defined group of companies that experience a common type of event, such as an announcement or stock split (Kothari & Warner, 2006). The event mentioned in the last sentence can occur at different times (announcement), or be accumulated at a certain point in time (regulation, index inclusion).

Here are the steps of the event study; The first step is to identify events and define the events window. For this study, the event date is November 3, 2015, and the event windows are (+2, -2) and (+5, -5) following Wai Kong Cheung, A. (2011). Second, set a criterion to select the companies to include in the analysis. In our study, for example, the companies are determined by the sustainability index. Third, predicting a “normal” return during the estimation window when an event does not occur. The only requirement is that the estimation window must be far from the event tag as it is not affected by the event. Ahern (2009) claims that using post-event data to estimate normal performance reduces specification error. Fourth, estimate the abnormal return within the event window, where calculated by subtracting the predicted return from the actual return Barr & Campbell (1997). There are several methods to predict an unexpected (abnormal) return or a normal (expected) return. Within these models, we benefited from the Market Model. The final step is testing whether an abnormal return is statistically significant.

Stock market data used for the event study comes from Yahoo Finance. The sample includes 29 companies, all included in the ISE Sustainability Index 2016. Daily stock returns are calculated from daily stock prices from November 3, 2014, to April 29, 2016. The formula used to calculate daily returns is shown below;

$$R_{jt} = \ln(P_{jt} / P_{jt-1}) \quad (1)$$

R_{jt} = the return of company j at day t , P_{jt} = the share price of company j at day t , P_{jt-1} = the before-day share price of company j at day t . The market variable used in the analysis is ISE100

5. RESULTS

Event study analysis is applied to our data. Our sample includes the daily returns of 29 companies from November 3, 2014, to April 29, 2016. The event date is assumed to be November 3, 2015. The estimation periods are (-2, -253) for the (+2) event window and (-5, -253) for the (+5) event window. To obtain cumulative abnormal returns, we followed several steps. First, we regressed the company's return on the market return using the following equation

$$\text{Return} = \text{constant} + \beta_0 * \text{market return} + \Theta_i \quad (2)$$

Table 2
Event Study Results

Company name	(+5,-5)				(+2,-2)			
	Constant	β_0	Adj R ²	F-statistic	constant	β_0	Adj R ²	F-statistic
AEFES	-0.0001 [0.0012]	0,7261 [0.0881]	0,212	66,39 [0.0000]	-0.0000 [0.011]	0.7206 [0.0881]	0.2099	66.90 [0.0000]
AKBNK	-0.0000 [0.0005]	1.4124 [0.0416]	0.8251	1147.31 [0.0000]	-0.0021 [0.0022]	2.1407 [0.1618]	0.4115	175.09 [0.0000]
AKSEN	0.0005 [0.0013]	-0.1338 [0.1008]	0.0031	1.76 [0.1857]	-0.0019 [0.0030]	0.7795 [0.2198]	0.0444	12.58 [0.0005]
ARCLK	0.0009 [0.0008]	0.6247 [0.0651]	0.2724	91.97 [0.0000]	0.0138 [0.0137]	-3.9851 [0.9938]	0.0571	16.08 [0.0001]
ASELS	0.0018 [0.0012]	-0.0631 [0.0928]	-0.0022	0.46 [0.4972]	-0.0012 [0.0030]	0.9050 [0.2223]	0.0589	16.57 [0.0001]
BRISA	0.0000 [0.0010]	0.8999 [0.0780]	0.3520	132.97 [0.0000]	-0.0004 [0.0011]	1.0446 [0.0804]	0.4021	168.49 [0.0000]
CCOLA	-0.0010 [0.0009]	0.7224 [0.0677]	0.3173	113.92 [0.0000]	0.01795 [0.0198]	-5.9430 [1.4255]	0.0609	17.14 [0.0000]
DOAS	0.0008 [0.0016]	1.1207 [0.1222]	0.2548	84.10 [0.0000]	-0.0016 [0.0032]	2.0588 [0.2346]	0.2338	77.00 [0.0000]
EREGL	-0.0000 [0.0009]	0.7387 [0.0716]	0.3024	106.33 [0.0000]	-0.0023 [0.0025]	1.5559 [0.1869]	0.2152	69.26 [0.0000]
FROTO	0.0009 [0.0010]	0.7159 [0.0752]	0.2691	90.46 [0.0000]	0.0200 [0.0198]	-5.9421 [1.4302]	0.0613	17.26 [0.0000]
GARAN	-0.0008 [0.0018]	-0.2002 [0.1381]	0.0045	2.10 [0.1486]	-0.0040 [0.0039]	0.9772 [0.2873]	0.0407	11.57 [0.0008]
ISCTR	-0.0001 [0.0006]	1.3642 [0.0514]	0.7431	703.80 [0.0000]	0.0027 [0.0031]	0.34015 [0.2252]	0.0051	2.28 [0.1322]
KCHOL	0.0007 [0.0009]	-0.0058 [0.0740]	-0.0041	0.01 [0.9366]	0.0047 [0.0040]	-1.3261 [0.2910]	0.0735	20.75 [0.0000]
MGROS	-0.0006 [0.0008]	0.8291 [0.0627]	0.4170	174.79 [0.0000]	0.0011 [0.0019]	0.2433 [0.1416]	0.0078	2.95 [0.0869]
OTKAR	0.0015 [0.0016]	0.8752 [0.1166]	0.1855	56.35 [0.0000]	0.0088 [0.0079]	-1.7563 [0.5781]	0.0320	9.23 [0.0026]
PETKIM	0.0008 [0.0007]	0.6685 [0.0556]	0.3711	144.38 [0.0000]	-0.0027 [0.0036]	1.8940 [0.2659]	0.1665	50.72 [0.0000]
SAFGYO	-0.0003 [0.0011]	0.5091 [0.0852]	0.1249	35.68 [0.0000]	-0.0029836 [0.0028]	1.4075 [0.2088]	0.1514	45.43 [0.0000]
SAHOL	-0.0001 [0.0006]	1.0469 [0.0503]	0.6394	431.96 [0.0000]	0.0453411 [0.0472]	-14.8575 [3.4160]	0.0671	18.92 [0.0000]
TAVHL	0.0013 [0.0010]	0.4483 [0.0793]	0.1129	31.91 [0.0000]	0.0037301 [0.0028]	-0.4445 [0.2078]	0.0142	4.58 [0.0334]
TCELL	0.0001 [0.0008]	0.7062 [0.0618]	0.3473	130.28 [0.0000]	-0.0007 [0.0014]	1.1001 [0.1048]	0.3048	110.16 [0.0000]
THYAO	0.0006 [0.0010]	1.0665 [0.0748]	0.4539	203.00 [0.0000]	-0.0004 [0.0014]	1.4506 [0.1076]	0.4205	181.69 [0.0000]
TOASA	0.0015 [0.0011]	0.7039 [0.0858]	0.2141	67.18 [0.0000]	0.0047 [0.0034]	-0.3970 [0.2494]	0.0061	2.53 [0.0334]
TSKB	-0.0007 [0.0010]	-0.0036 [0.0806]	-0.0041	0.00 [0.9639]	-0.0046 [0.0037]	1.1959 [0.2705]	0.0693	19.54 [0.0000]
TTKOM	0.0002 [0.0009]	0.6966 [0.0681]	0.2987	104.52 [0.0000]	0.01627 [0.0168]	-4.9015 [1.2054]	0.0625	16.53 [0.0001]
TUPRS	0.0021 [0.0021]	0.7360 [0.0009]	0.3098	110.10 [0.0000]	0.0238 [0.0228]	-6.8968 [1.6417]	0.0664	17.65 [0.0000]
ULKER	0.0009 [0.0010]	0.59575 [0.0817]	0.1766	53.10 [0.0000]	-0.0018 [0.0030]	1.5692 [0.2214]	0.1683	50.19 [0.0000]
VAKBNK	-0.0003 [0.0006]	1.430427 [0.0518]	0.7576	760.42 [0.0000]	-0.0029 [0.0028]	2.3383 [0.2011]	0.3527	135.13 [0.0000]
VESTL	-0.0006 [0.0021]	1.458034 [0.1597]	0.2530	83.32 [0.0000]	0.0015 [0.0032]	0.6538 [0.2300]	0.0315	8.08 [0.0049]
YKBNK	-0.0010 [0.0005]	1.2290 [0.0389]	0.2530	83.32 [0.0000]	-0.0020 [0.0012]	1.5811 [0.0852]	0.5796	344.36 [0.0000]

We use the coefficients obtained from the equation (1) to calculate abnormal returns and cumulative abnormal returns. The results of the cumulative abnormal return (CAR) are shown in Table 5.2. Part A of the table provides results for the (+5,-5) window and Part B provides results for the (+2,-2) window. According to Panel A, the cumulative abnormal returns of 15 out of 29 companies are not significantly negative, and 14 companies are not significantly positive. Therefore, we reject the null hypothesis that the cumulative anomalous rate of return is zero for all firms between the window (+5, -5). In addition to t-statistics for the total cumulative anomalous return for all firms, they indicate rejection of the null hypothesis of zero cumulative anomalous rate of return for all firms. Field b of Table 5.2 provides results for the (+2, -2) window. Companies so-called GARAN and ULKER are just two companies showing significant negative cumulative abnormal returns. The other 11 companies have negative non-significant cumulative anomalous returns, and the remaining 16 companies have non-significant cumulative anomalous returns coefficients. Table 5.2 contains results for the cumulative abnormal rate of return for all companies. Again, panel A is for (+5, -5) windows, and panel B is for (+2, -2) windows. The results in Panel A show that the cumulative anomalous return of all companies is not significant. Therefore, we do not reject the null hypothesis. However, we reject the null hypothesis (Panel B). for a shorter window of events.

Table 3
Cumulative Abnormal Returns

Symbol of the Firm	Name of the Firm	Sector	Panel A (+5,-5)	Panel B (+2,-2)
			CAR	CAR
AEFES	Anadolu Efes Biraçılık ve Malt Sanayi A.S	Beverage	-0.0566	-0.0315
			[-0.9578]	[-0.6269]
AKBNK	Akbank A.S	Financial	0.0070	-0.0402
			[0.2207]	[-0.9927]
AKSEN	Aksa Enerji Üretim A.S	Energy	0.0098	-0.0998
			[0.1227]	[-1.4222]
ARCLK	Arçelik A.S	Industrial	-0.0134	0.2234
			[-0.1994]	[0.8612]
ASELS	Aselsan Elektronik Sanayi ve Ticaret A.S	Industrial	-0.0174	-0.01876
			[-0.2734]	[-0.2369]
BRISA	Brisa Bridgestone Sabancı Lastik San. ve Tic. A.S	Industrial	0.01720	-0.0132
			[0.4896]	[-1.6530]
CCOLA	Coca-Cola İçecek A.S	Beverage	0.0370	0.3127
			[0.5935]	[0.7942]
DOAS	Doğuş Otomotiv Servis ve Ticaret A.S	Automotive	0.0473	-0.0064
			[1.2200]	[-0.0808]
EREGL	Eregli Demir ve Çelik T.A.S	Industrial	-0.0304	-0.0696
			[-0.4279]	[-0.8014]
FROTO	Ford Otomotiv Sanayi A.S	Automotive	-0.0144	0.2550
			[-0.3194]	[0.7124]
GARAN	T.Garanti Bankası A.S	Financial	0.1326	-0.0888*
			[0.9610]	[-1.7203]
ISCTR	T.İs Bankası A.S	Financial	-0.0119	0.0405
			[-0.4347]	[0.5549]
KCHOL	Koç Holding A.S	Multiple	0.0475	0.0863
			[1.1604]	[1.2460]
MGROS	Migros Türk T.A.S	Basic Materials	0.0459	0.0989
			[0.6530]	[1.1415]
OTKAR	Otokar Otomotiv ve Savunma Sanayi A.S	Automotive	-0.0083	0.0951
			[-0.2033]	[0.7001]
PETKM	Petkim Petro-Kimya Holding A.S	Energy	0.0329	-0.0127
			[1.2588]	[-0.2020]
SAFGY	Saf Gayrimenkul Yatırım Ortaklığı A.S	Construction	-0.0025	-0.0417
			[-0.0868]	[-0.7709]
SAHOL	Hacı Ömer Sabancı Holding A.S	Multiple	-0.0120	0.6461
			[-0.3573]	[0.7136]
TAVHL	Tav Havalimanları Holding A.S	Transportation	-0.0457	0.0098
			[-1.0720]	[0.1287]
TCELL	Türkcell İletişim Hizmetleri A.S	Telecommunication	-0.0029	-0.0361
			[-0.0665]	[-0.6460]
THYAO	Türk Hava Yolları A.O	Transportation	0.0464	0.0340
			[1.4424]	[1.1092]
TOASO	Tofaş Türk Otomobil fabrikası A.S	Automotive	0.0295	0.0413
			[0.4525]	[0.4248]
TSKB	Türkiye Sınai Kalkınma Bankası	Financial	-0.0186	-0.0580
			[-0.2884]	[-0.8215]
TTKOM	Türk Telekomunikasyon A.S	Telecommunication	-0.0363	0.2461
			[-0.8229]	[0.7814]
TUPRS	Tupras- Türkiye Petrol Rafinerileri A.S	Gas and Oil	-0.0375	0.2753
			[-0.6932]	[0.6907]
ULKER	Ülker Bisküvi Sanayi A.S	Food	-0.0400	-0.1083***
			[-0.8563]	[-3.3524]
VAKBN	Türkiye Vakıflar Bankası T.A.O	Financial	0.0591	0.0080
			[1.3063]	[0.3468]

Note: z-test statistics are provided in brackets.***, ** and * Significance at the 1%, 5%, and 10% levels respectively

6. CONCLUSION

This study examines the reaction of stock markets to the inclusion of companies in the Istanbul Stock Exchange Sustainability Index (ISESI) in 2016 on daily basis. Results indicate that at the (+5, -5) event window, there is not a significant CAR for any of the companies. When we examine at the firm basis, even though there is a strong positive influence at the cumulative abnormal returns across all companies at the (+2, -2) event window, only two companies are considerably impacted. At the (+2, -2) window, these companies' cumulative abnormal returns are negative. Oberndorf et al. (2013) find similar results. Accordingly, becoming a part of the 2016 ISE Sustainability Index has a short-term announcement effect, but this effect vanishes during the (+5, -5) event window. The findings that are obtained from the event study analysis are in the same way as Çıtak and Ersoy (2016), Curran & Morran (2006) and in contrast way with the aspect of Berhelot et al.(2012).

It is possible to expand this study in many ways. A growing number of companies will be selected for the ISE Sustainability Index in the future. Therefore, more event dates and more companies can be added to the study. It is also possible to conduct an event study with these two different types of events since some companies are excluded from the index. There is no limit to the number of inclusions or exclusions that can be evaluated simultaneously.

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