



The Clean Techs equity indexes at stake: Risk and return dynamics analysis



Eduardo Ortas*, José M. Moneva

Faculty of Business and Economics, University of Zaragoza, C/ Gran Vía nº2, 50005 Zaragoza, Spain

ARTICLE INFO

Article history:

Received 2 September 2012

Received in revised form

17 March 2013

Accepted 18 March 2013

Available online 20 April 2013

Keywords:

Clean technologies

Energy companies

Environmental economics

Kalman Filter

State-space modeling

ABSTRACT

The goal of this paper is to measure the financial performance of 21 primary Clean Techs (CT) equity indexes, covering the primary energy markets worldwide. We use a modified state-space market model to recursively estimate the risk/return performance of each index, and two market benchmarks are considered, thus providing a more accurate picture of the financial outcomes of investing in these relatively new financial instruments. The main findings indicate that during periods of market stability, Clean Techs indexes outperform market portfolio in terms of returns. This superior performance is a consequence of the higher risk levels associated with Clean Techs indexes. This research also supports that CT indexes with a restricted investment universe underperform the market portfolio in terms of returns. Moreover, we find a structural change in the dynamics of the Clean Techs indexes' return/risk performance that coincides with the beginning of the financial crisis. Although the CT indexes are highly volatile financial instruments, even in bull market periods, they turn even riskier during the recent financial crisis. In addition, the CT provider portfolio allocation policy and the activities covered by these indexes influenced the risk/return performance of a limited number of CT equity indexes.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

An ancient Amerindian proverb has said, “*Earth is not a gift from our parents, it is a loan from our children.*” It is difficult to find other words to better describe that the planet resources are scarce [1,2]. However, humanity has survived for centuries partially ignoring this fact. Thus, it is not surprising that the poor condition of the planet is a result of a social development model that indiscriminately uses natural resources [3]. It is also interesting to note that not until the after the second half of the twentieth century did a responsible social initiative emerge, indicating the urgent need to preserve the planet [4]. This idea was further embraced by the widely known “sustainable development” concept, defined by the World Commission on Environment and Development (WCED) as a process of change in which the exploitation of resources, direction of investments, orientation of technological development, and institutional change are in harmony and enhance both the current and future potential to meet human needs and aspirations [5]. Consequently, this approach involves a pattern of resource use that aims to meet human needs while preserving the environment so

that these needs can be met not only in the present but also by future generations [6]. To achieve this goal, it seems crucial that institutions and corporations collaborate closely [7]. The companies' role in this process is especially important because they are among the primary users of natural resources [8]. The importance of corporate participation is reflected by the “triple bottom line” approach [9], indicating that companies should broaden their predominant concerns with economic issues, taking social and environmental factors into account.

However, development of domestic economies and improvements in social well-being imply an increase in energy consumption [10]. Thus, companies in the energy sector have a relevant function in that process — not only as energy providers but also as entities that significantly impact the environment [11]. This economic sector has witnessed a progressive transition from the exploitation of different fossil fuels to the development of the so-called Clean Techs (CT) [12,13]. Such technology is defined as any product, service, or process that delivers value using limited or zero non-renewable resources or creates significantly less waste than do conventional offerings [14]. Over the past 10 years, the renewable energy sector has become one of the fastest growing segments of the industry, due primarily to concerns about climate changes [15,16], energy security issues, and peak oil prices but also due to new technologies and environmentally conscious consumers

* Corresponding author. Tel.: +34 976761000x4915; fax: +34 974228549.
E-mail address: edortas@unizar.es (E. Ortas).

[17,18]. As a consequence of the increase in the number, volume, and relevance of companies that embrace development and the exploitation of clean energies [19], several CT equity indexes have been developed worldwide. These nonconventional indexes comprise companies involved in eight major clean technology sectors: (i) solar power, (ii) wind power, (iii) biofuels, (iv) green buildings, (v) personal transportation, (vi) the smart grid, (vii) mobile applications (such as portable fuel cells) and (viii) water filtration.

Although some research has attempted to assess the financial performance of CT or alternative energy firms, little is known about the performance of CT equity indexes performance [20–22]. In this context, the research presented here represents, to the best of our knowledge, the first attempt to measure the risk/return performance of the primary CT equity indexes. This work will provide important information that will contribute to the improvement of asset allocations in environmentally oriented portfolios, thus complementing recent research about socio-environmental portfolios [23]. To this end, we examine a novel database of 21 CT indexes, which cover the primary energy markets worldwide, thus increasing the relevance of the results. Moreover, this research uses different benchmarks (BMs) to assess the financial performance of the CT equity indexes, thus allowing for better generalization of the results. The BMs considered are the MSCI World Index (MSCI WI) and Standard and Poor's 500 Index (S&P 500 Index). These are the most common BMs used in finance to evaluate the performance of a global investment alternative. Specifically, the MSCI WI is a free float-adjusted market capitalization index designed to measure the equity market performance of developed markets.¹ The second BM used — the S&P 500 Index — is a free float capitalization-weighted index based on the common stock prices of the Top 500 publicly traded American companies² and is one of the most commonly followed indices. Many consider it the best representation of world market conditions.

This research examines a timeframe that covers the financial downturn in mid2007. This period is of special interest because we can determine whether it influenced the risk/return performance of the CT equity indexes considered. Furthermore, this research employs dynamic econometric models to assess the different CT equity indexes' performance, providing a more accurate picture of the financial outcomes of investing in these relatively new financial instruments. This is of special relevance because this approach will allow investigation of the robustness of the CT indexes; that is, testing whether the CT indexes' risks/returns present different behaviors across bull and bear market periods. Finally, we use daily market data instead of the monthly data, making our estimates comparatively more robust.

The rest of the paper is organized as follows. Section 2 introduces a thorough review of previous research in the field. Section 3 presents the methods and a descriptive study of the data. The performance analysis is described in Section 4. Finally, conclusions, implications and future research opportunities are provided in the last section.

2. Literature review

During the last several decades, there has been a significant increase in the number of both individual and institutional investors

seeking to invest in well-governed, environmentally friendly firms that strive to be socially responsible [24]. As a consequence, a large body of literature emerged that has examined the financial outcomes of investing in these companies [25,26]. Specifically, some research on this topic has attempted to investigate the relationship between environmental stewardship [18,27] and the financial performance of several companies and traded funds. In general, these works test whether the firms that actively undertake environmentally friendly strategic policies can obtain future cost savings and increased levels of profitability by increasing efficiency and reducing compliance costs [28–31]. Some of the pioneering works in this field have shown that better pollution performance has improved profitability [32] and reduced risks [33]. Other studies have shown no significant link between measures of environmental performance and profitability [34,35] or between environmental performance and corporate disclosure practices [36,37]. However, Stevens [38] and Thomas [39] find evidence of the existence of a positive link between the adoption of environmental sustainability policies by several companies and their financial performance. Moreover, Holman et al. [40] find that federal compliance liability costs and profitability were negatively related, and Roberts [41] indicates that those large Fortune 500 companies more active in disclosing social and environmental reports obtain better returns. The opposite relationship — profitability positively influences the environmental disclosure phenomenon — is also supported [41]. Moreover, Blacconiere and Patten [42] and Freedman and Patten [43] have shown that investors rewarded those companies that disclosed environmental reports in their annual financial statements. The literature also contains studies arguing that companies that adopt green measures are forced to invest significantly in technology as a consequence of regulation compliance, with the magnitude of the necessary investment leading to negative returns [44]. Further research, such as that provided by Klassen and McLaughlin [29], finds that significant positive returns are associated with strong environmental performance. This correlation is more remarkable when environmental are linked to increases in companies' market valuation. Similarly, Chan and Milne [45] conclude that those firms that invest in reducing their impacts on the environment are positively valued by stakeholders and especially by investors. Furthermore, Hughes [46] shows that investors penalize polluting companies more than they do nonpolluting companies. Likewise, Lorraine et al. [47] show that the stock market responds to publicity about fines for environmental pollution. Moreover, Moneva and Ortas [48] find evidence for the existence of a positive correlation between environmental and financial performance. Recently, Boulatoff and Boyer [49] examined a sample of more than 300 green companies and found that Nasdaq firms outperform green firms. However, Chia et al. [31] find that a sample portfolio of renewable energy stocks outperformed both a global market index and a sub-index consisting of traditional energy stocks.

As derived from the analyses of previous literature, in general, little effort has been made toward assessing the risk/return performance of CT indexes. The present research aims to contribute to the existing literature by examining financial characteristics of a wide range of CT equity indexes that represent the most relevant CT companies globally. In fact, these CT companies are considered to have better levels of environmental performance than conventional energy firms operating with fossil fuels. Specifically, the literature provides several reasons for this performance difference: (i) CT companies generate lower levels of Greenhouse Gas Emissions (GHG) [50,51], (ii) they are expected to generate lower negative externalities to the environment [52], (iii) they are placed in the first positions of less polluters rankings [53], and (iv) they are less exposed to economic penalties derived from environmental rules violations [54,55].

¹ The MSCI World Index covers the stock markets of the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, The Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. This link to the Morgan Stanley Capital International has further details: <http://www.msci.com/products/indices/tools/index.html#WORLD>.

² See, for instance, this link for further details about composition, methodology and other issues related to the S&P 500: <http://eu.spindices.com/>.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات