

Corporate Sustainability and Financial Indexes

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Introduction

Investors increasingly see forward-looking nonfinancial metrics as key to understanding a company's true value, while stakeholders demand ever greater transparency from multinationals on how they are managing their responsibilities to society at large and the environment. These trends are manifested in the increasing impact sustainability is having on mainstream investors, as illustrated by the following:

- Since its launch in 1999, the Dow Jones Sustainability World Index (DJSI World)² has benchmarked the performance of the world's leading sustainability companies, enabling investors to track and adapt their products along sustainable guidelines. As of August 2001, 33 licensees have created financial products based on the DJSI World, with total assets under management amounting to more than 2.2 billion Euro. These investors are offering sustainability-driven mutual funds, equity baskets, certificates, and segregated accounts.

- Other leading organizations on both sides of the Atlantic have also been involved in supplying the investment community with indexes around this theme. For example, since 1990, KLD (KinderLydenbergDomini) has managed the Domini 400 Social Index³ with particular emphasis on the societal contribution of North American companies. Moreover, in July 2001, UK-based index provider FTSE (Financial Times Stock Exchange) launched the FTSE4Good⁴ series of indexes to provide a benchmark to the SRI (Socially Responsible Investment) community.
- Recent legislative changes in Europe and Australia have also confirmed the trend toward incorporating sustainability criteria in investment decision-making. For example, both the UK⁵ and Germany⁶ have passed laws obliging pension funds to disclose their investment policy with regard to environmental and social criteria. In August 2001, Australia's Senate⁷ passed an amendment to the Financial Services Reform Bill to require super funds and investment managers to disclose their policy on ethical investment.
- Significantly, the Swiss Federal Social Security Fund awarded State Street Global Advisors, the investment management arm of State Street Corporation, a 320 million Euro global equity index mandate based on the DJSI World in May 2001, the largest mandate of its kind.⁸

Previously, and despite high demand, the investment community was unable to rely on credible socioenvironmental data on which to base microeconomic decisions due to lack of availability of relevant data. Now, the ability to make macroeconomic decisions around socioenvironmental issues, which has been possible for many years, is complemented by a new ability to make associated microeconomic decisions due to recent developments in data provision around sustainability.

This paper outlines the challenges in assessing the sustainability performance of the world's largest companies and integrating the results into an index tracking the financial performance of leading companies. Following a definition of corporate sustainability, we focus on exploring the characteristics of traditional indexes and what implications these have on the challenge of indexing the performance of companies that embrace sustainability. Subsequently, we describe the process for developing the Dow Jones Sustainability World Index (DJSI World) as an introduction to the issue of how the specific challenges of assessing corporate sustainability have been addressed, with particular focus on the implications for indexes tracking the stock market performance of companies embracing sustainability. Finally, the risk and performance attributes of the DJSI World are explored to determine the value and validity of tracking the performance of corporate sustainability leaders in general.

Table 1

Sustainability Driving Forces

Ecological Forces	Sociocultural Forces	Economic Forces
Global climate changes and ecological instabilities	Global transparency in society through media and technological connectivity—corporate behavior is clear for all the world to see	Increasing speed-embracing innovation and product cycles, business relationships, and competition
Increasing ecological degradation with negative impact on human health and quality of life	Divergent demographic trends in developed and less-developed regions	Continuous scientific and technological progress
Loss of ecosystems and biodiversity	Wide social imbalances and inequalities in developed and less-developed regions (income, poverty, human rights, etc.)	Information is key factor
Lower capacity of natural sinks as carrying capacity is decreasing (soil, water, forests, etc.)	Urbanization and urban lifestyles	Technological connectivity and virtualization of (business) relationships
Scarcity of water in terms of both quality and volume	New lifestyles of self-organized groups with shared values	Globalization and liberalization of economic activities
	Consumer behavior changing due to awareness of inequalities, social imbalances, human rights, and unfulfilled development potential	Increasing power of multinational businesses compared to national states
	Consumer behavior changing due to awareness of ecological changes and social instabilities	Shift from supply-side to demand-side markets
	Healthy living as an important part of individual lifestyles	

Definition of Corporate Sustainability

One of the early attempts to define sustainability was presented by the Brundtland Commission⁹ at the United Nations General Assembly in 1987: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987).

If one considers businesses as living organisms, the need to behave in a way that avoids compromising societal and ecological systems is clear. Not compromising their ecological, societal, and economic environment in a wider sense is of vital interest to a company. As the environment in which economic activities are embedded becomes more unpredictable and fragile, higher-risk premiums are paid for increased volatility and uncertainty. Highly efficient economic systems (to ensure efficient resource allocation) require predictability and cannot afford to spend great resources on stabilizing the systems of the wider environment (for example, financing safety measures or remediation). Sustainability on a long-term basis requires businesses to satisfy the needs of their clients in a way that their products and the organization of their services (the value chain) follow the dynamic systems rules of ecological and sociocultural systems. Since societal, cultural, and ecological systems are not stable, their dynamic balances are in a state of permanent change.

Thus, businesses survive, not by maintaining a static business model, but by propagating their species, thereby indicating that sustainable business must be a dynamic state. Consistently reinventing a company in line with market, societal, and environmental realities and changes to ensure its own sustainability has proved the key to longevity and profitability of businesses (de Geus and Senge, 1997). The challenge of enabling sustainable economic growth, in the broad sense, offers new opportunities for companies to enhance their shareholder value by aligning with the emergent realities of the environment in which they operate. In line with this philosophy, *corporate sustainability* can be defined as:

a business approach to create long-term shareholder value by embracing opportunities and managing risks deriving from economic, ecological and social developments or changes.

These economic, ecological, and social developments or changes are trends that need to be considered and managed effectively, by maximizing the opportunities and minimizing the risks they present, if a company is to contribute to a sustainable future for itself and the parts of the systems in which the business is embedded. While a full discussion of these forces is beyond the scope of this paper, a summarized list of trends is illustrated in Table 1.

Increasing awareness of the trends highlighted above enhances the importance of a company's management of these developments. Companies that understand how these forces offer opportunities to enhance shareholder value, or pose risks to shareholder value, and adjust their corporate strategies and operational procedures accordingly, are on the road to achieving corporate sustainability. Probably one of the most important driving forces is the dramatic increase in transparency, caused by global media and connectivity. In turn, this increases the importance of brand integrity and the need to develop trust among all stakeholders.

Using Corporate Sustainability in the Investment Community

An index tracking the performance of companies addressing sustainability is valuable when it provides insight into the future financial prospects of a company or industry that conventional analysts are unlikely to incorporate, given a lack of focus on the potential for certain social, environmental, and economic issues in society to materialize and affect companies.

As traditional valuation metrics and historical corporate information increasingly concede importance to future-oriented, forward-looking indicators of the health of a company and its attractiveness to an investor, indexing the performance of companies addressing sustainability attempts to provide investors with the insights they are increasingly seeking (Funk, 2001). Thus, as an investment insight, equity research in relation to sustainability must be:

- forward-looking;
- based on industry-specific value drivers (as opposed to generic data);
- transparent and easily understood; and
- capable of adding value to existing valuation methods.

Assessing corporate sustainability aims to incorporate the characteristics mentioned above and offers insight across most equity asset classes and investment styles. The hypothesis for the business case for sustainability interpreted as a portfolio of stocks is that these stocks will be expected to outperform comparable portfolios, at least in the long run. The reasoning for this expectation is sound. Companies embracing global sustainability trends are likely to achieve a higher return on equity (ROE) and/or a lower required rate of return (RRR) than companies that ignore these trends. Higher ROE may result from a better understanding of investment opportunities or from lower non-operating cost, because of a better understanding of risks. Higher ROE may also result from social pressure groups channeling demand into sustainable products.

A lower RRR may result from a better understanding and management of risks. The RRR is a function of both operat-

ing and financial risks. Companies embracing sustainability trends may reduce their operating risks and, thereby, lower their equity costs. It presumably would also result in lower borrowing costs, leading to lower costs of capital, and, again, to higher ROE. Lower borrowing costs may also be the result of investors considering other parameters than just risk and return. High ROE and low RRR result in free cash flow that can be invested profitably when embracing sustainability trends. A portfolio, or an index composed of this type of company, thus will appreciate faster than a portfolio or an index of companies not embracing theoretically profitable investment opportunities. Investments in companies embracing sustainability thus promise higher returns and, due to lower business risk, better risk-return ratios. Based on this hypothesis, better performance can also be expected on a risk-adjusted basis.

Index Characteristics & Challenges for Sustainability

Characteristics of an Index

Security market indexes, or, more generally, security market indicator series, are designed to reflect valuation and changes in the valuation of a specific universe of securities (Reilly and Brown, 1997). They are intended to represent a universe or population of securities. Movements of the index's performance are supposed to allow inference to movements in the performance of the securities in the underlying universe. The universe targeted, together with the purpose of the indicator, determines which factors need to be considered in designing the index. Sample size, sampling method, and the weighting scheme are prominent examples of design elements.

The targeted universe can cover as much as the broad domestic economy or as little as some subset of a particular niche security market. The DJSI reflects changes in valuation of a universe of companies that are leaders in terms of corporate sustainability. The universe of companies embracing sustainability is broader than the DJSI, but the DJSI comprises the leaders in corporate sustainability, as judged by industry. Thus, the DJSI not only traces, but also implies, a universe of leading companies with regard to addressing sustainability.

Indexes are based on statistical information and calculation and, in general, have the following characteristics:¹⁰

- accurate and reliable data;
- clear, transparent, and replicable methodology;
- rules-based processes;
- objective and bias-free; and
- component data freely available.

An index tracking the performance of corporate sustainability leaders must have all the above-mentioned characteristics of a

traditional index. In addition, it must be flexible enough to meet changing indexing trends and investor demands, such as the demand for broader benchmarks.

Challenges for an Index Tracking Corporate Sustainability

Over recent years, increasing numbers of investors have been aligning their investment strategies along sustainability criteria. This growing number of new financial products integrating sustainability in their core investment strategy provided the impetus for a neutral, rigorous, transparent, and easily replicable measurement of corporate sustainability. The challenge facing the indexing industry has been how to measure and quantify corporate sustainability, and how to integrate the results into an investable index that meets the needs of the investment industry.

By incorporating this type of equity research into an index, very specific new challenges arise—namely, and in no particular order:

Development of relevant assessment criteria (generic and industry-specific)

An index tracking the performance of corporate sustainability leaders first needs to define corporate sustainability and relevant assessment criteria. Criteria representing the challenges deriving from sustainability trends have to be developed and quantified in such a way that the best-positioned companies can be measured and identified.

Gathering of corporate information

An important challenge is how to gather the correct and relevant information to measure economic, environmental, and social performance dimensions. While some global companies publish corporate sustainability reports, the majority of companies are only beginning to understand and, hence, report on the concept of corporate sustainability. More important, not all data are consistent, relevant, or comparable.

Quantification of corporate sustainability

A key challenge in developing an index tracking corporate sustainability is how to quantify corporate sustainability. In most cases, sustainability developments are qualitative in nature, so they may lack easy quantification. While assessing companies' environmental performance and emission targets seems relatively straightforward, a consistent and equally quantifiable method is not readily available for many aspects of social and economic developments.

Identification of sustainability leaders in each industry group

Given that sustainability trends affect each industry differently, industry-specific challenges arise. As a result, industry

leaders need to be identified for each industry group, known as a "best-in-class" approach. Sustainability leaders within each industry group need to be ranked according to their corporate sustainability performance relative to one another. Individual industry groups should not be excluded based on the perceived sustainability of the particular sector.

Constructing an index with appropriate selection rules

A further challenge is how to construct the index. While most indexes represent a group of stocks with a specific goal, it is imperative to define clear selection rules reflecting the particular focus of the specific index. The number of companies considered corporate sustainability leaders and how their stock should be weighted is the critical consideration and challenge when selecting final components. When identifying leaders for each industry group, minimum sustainability standards need to be set to clarify at what threshold a company should no longer be considered a sustainability leader.

Fulfilling traditional index requirements

A corporate sustainability index needs to fulfill all the characteristics of a traditional index—it should be accurate, reliable, transparent, and consistent.

The Dow Jones Sustainability Indexes,¹¹ a collaboration of Dow Jones Indexes and Sustainable Asset Management (SAM), were developed as a response to these needs and challenges and, since its launch in 1999, have grown in number of licensees and assets under management. The next section of this paper explores the process used to develop the DJSI World as an example of how these challenges are being met.

Construction of the Dow Jones Sustainability Index

The index construction process of the Dow Jones Sustainability World Index (DJSI World) provides a good introduction to how index providers address the challenge to produce indexes tracking the financial performance of sustainability leaders. A description of the general challenges and how these were solved in the most important process steps of the DJSI World is described below (with the exception of the assessment step, which is described in detail in the next section).¹²

Investable Universe and Industry Allocations

In determining the initial investable universe from which the final components of the index are selected, key issues to consider are the core purpose of the index, what the index should represent, the acceptable level of liquidity of the stocks, the acceptable level of tradability, and the optimal level of convergence of the currencies represented. The Dow Jones World Index of the 2,500 largest companies in market capitalization, of the total universe of more than 5,000 companies, is used as

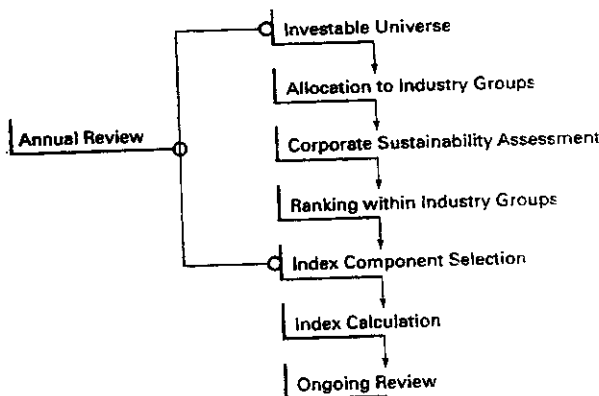
Figure 1

Overview of DJSI Construction Process

Dow Jones Sustainability Indexes

A cooperation of Dow Jones Indexes, STOXX Ltd. and SAM Group

Index Construction Process



a basis for the DJSI World investable universe. The targeted universe can cover as much as the broad domestic economy or as little as some subset of some niche security market.

A further critical step is determining the allocation of industry groups for the investable universe. The homogeneity of the stocks allocated to each industry group must be fairly high because dependence on similar sustainability trends allows comparison among the relative performance of industry components, which are based on the 64 industry groups of the DJSI World.

Component Selection

Several challenges exist in the actual construction process. Regarding the ideal number of index components, the purpose of the index must be addressed. Decisions must be made about whether the index should provide an investment universe and benchmark for active asset managers or the direct basis for a financial product (such as an investment certificate). An active asset manager usually prefers to have a wide investment universe to have the possibility of choice in stock selections; however, a passive investor prefers a smaller universe to keep transaction costs low (for example, about 30 stocks for a certificate).

Moreover, the number of components has a major impact on the risk attribution of the index as a whole and depends on the overall sustainability score of companies that surpass a

minimum threshold of quality, the exact percentage of which is determined by specific assessor approaches. The DJSI decided to provide both a benchmark and an investment universe (DJSI in 2001–2002 contains approximately 300 components).

Setting the right threshold distinguishing the best-positioned companies from the others, and setting minimum standards to be applied should the overall level of quality within an industry be poor, is also a critical consideration regarding component selection. The threshold depends on the number of components needed per industry grouping because the “best-in-class” approach is not always applicable, given that there are industries in which few companies react to sustainability trends.

Component selection can be based on one of three possible approaches: market capitalization, numeric, or a mixture of both. Selection based on market capitalization has the major disadvantage of possibly being dominated by a single company with a very high market capitalization. Should the top-ranked company in terms of sustainability have a high market capitalization, no other companies embracing sustainability in that industry sector could qualify because the allocation of allowable market capitalization will already have been taken up by very highly capitalized stocks.

Selection based on the numeric approach would, for example, select the top 10 percent of companies based on the number of companies in the specific industry group. This method would select 250 companies from an industry group comprising 2,500 companies. This approach has the disadvantage of often not providing an ideal asset allocation per sector and, hence, a possibly limited risk spread.

Therefore, the DJSI World pursues a mixed approach incorporating both numeric and market capitalization-weighted elements,¹³ which allows for a good representation of an industry’s market capitalization while also assuring that the leading sustainability companies are included.

A further step in the selection of components is how the selected components should be weighted. With regard to traditional indexes, three methods are used to weight the components within indexes:

- market value-weighted (for example, NYSE Composite Index, Standard & Poor’s 500 Index, Nasdaq Composite Index, Wilshire 5,000, London FTSE, MSCI Indexes);
- price-weighted (for example, Dow Jones Industrial Average, DAX 100); and
- equal-weighted.

Regional and sector allocation, currencies, and the method of stock weightings need to be similar. In the case of the DJSI World, free-float price-weighted market capitalization was selected to reflect the DJGI's move to a similar basis.

In the next section, we examine how the DJSI World specifically addresses the challenges to assessing corporate sustainability and to developing an index to track the performance of companies addressing this issue.

Challenges of Measuring (Assessing) Corporate Sustainability and Developing an Index

The assessment of corporate sustainability performance forms the basis for an index tracking the performance of companies embracing sustainability. In this section, four specific challenges of corporate sustainability assessment are addressed:

- defining corporate sustainability criteria;
- gathering corporate sustainability information;
- quantifying corporate sustainability assessment results; and
- meeting requirements of traditional indexes.

Defining Corporate Sustainability Criteria

Selecting relevant and quantifiable criteria to assess corporate sustainability is a major challenge because the quality of the index components depends heavily on this aspect of the assessment process. Assessment criteria should be easy to measure, understandable, clear, and precise. Corporate sustainability is widely based on qualitative criteria, so the most significant challenge is to develop quantitative proxies for qualitative data and integrate these into a system that meets the major requirements of indexing (for example, the need for replicability and objectivity).

However, even quantitative data can be difficult to access for many reasons. First, as there are no standards for sustainability accounting (of environmental and sociocultural issues) and no legal obligation for accounting along these issues, data are not readily available. Second, accessing and comparing companies based on environmental and social information is difficult because companies are active in very different business lines even if they are considered to be part of the same industry group (for example, IBM and Dell are not comparable). Third, system borders may be defined differently by different companies because most use production sites as system borders, although some may include transport and storage sites as well. The only viable approach to defining corporate borders, therefore, would be to consider the whole life cycle of a product. However, companies often do not have the data since they

do not control the whole value chain. Fourth, there are no specific clear indicators from the investment community, and only very divergent standards for normalization and categorization (such as aggregating emissions according to global warming potential). Finally, many companies simply do not have any data to report on many of the issues that corporate sustainability assessments must cover, and when they do, there is very little historical information.

In the case of qualitative criteria, integration of qualitative issues into criteria with precisely defined parameters (for example, closed-end or multiple-choice questions to which a score is attributed) is the approach used in most assessment methodologies. However, a major challenge is defining the criteria parameters. For example, how many environmental policies/charters are considered the ideal number to be signed—two, five, or ten—when the real issue is the quality of the implementation of these charters?

Moreover, maintaining relevance of the criteria is another important challenge. Trends and industry challenges are in constant flux, which means that criteria must be updated constantly. For the DJSI World, assessment criteria are updated annually to keep them relevant. Furthermore, criteria should represent not only challenges deriving from global trends, but also regional challenges where possible. SAM's approach is based on the hypothesis that large-cap companies face similar challenges based on global social, environmental, and economic trends. The same rigorous approach applied worldwide for the DJSI World allows for clear comparisons despite geographic spread, and worldwide relevance of criteria.

Given the wide range of sustainability trends and driving forces, criteria must be selected geared to distinguish between sustainability leaders and laggards. In addition, criteria need to be interdependent to represent the systemic nature of companies. Studies have shown that companies that are leaders in one criterion are usually leaders in others as well.¹⁶ Therefore, it is important to select the right criteria, rather than a wide range of various unrelated criteria.

Table 2 provides an overview of the criteria used in the SAM Corporate Sustainability Assessment, which forms the basis for the DJSI World. This approach has been developed with the intention of addressing the challenges indicated above. In addition, criteria are derived from the sustainability trends highlighted in earlier sections and focus on factors such as industry value drivers and success factors in relation to managing the challenges of a changing environment. Each criterion listed is divided further into subcriteria that are not listed.

In essence, assessing a company by specific criteria incorporates evaluation of a number of issues, specifically:

- exposure of a company to a specific criterion (the challenge the company faces with regard to particular criterion);
- the company's policies and strategies to cover specific criteria;
- the management systems to implement policy/strategy;
- internal review processes to check progress in relation to specific criteria; and
- a company's track record—both quantitative (if released) and qualitative (documents, interviews, media, and stakeholders).

Criteria used in the DJSI World corporate sustainability assessment are reviewed annually, and external experts are asked to provide insight and recommendations to improve criteria and the entire assessment methodology. Moreover, efforts such as the Global Reporting Initiative are taken into account to ensure that the criteria used are fully aligned with efforts to standardize corporate sustainability reporting and assessment.

Gathering Corporate Sustainability Information

Standards for corporate sustainability assessment and reporting, unlike financial reporting and analysis, have not been defined or standardized so new methods to gather relevant and applicable information have to be created. Many sources of information exist, including company reports, questionnaires, industry studies, interviews with companies, third-party opinions (stakeholder inputs), and various media. Some sources are used to access basic information and insight; others are used to check the validity and truthfulness of company responses to questionnaires and interviews.

Because companies have differing interpretations of how to report sustainability performance, many environmental, social, and/or sustainability rating agencies have created questionnaires to fill this void. However, people may read and understand questions in an assessment questionnaire differently because of language barriers, lack of guidelines, or

Table 2

SAM Corporate Sustainability Assessment Criteria

	Opportunities	Risks
Economic	<ul style="list-style-type: none"> • Strategic and financial planning • Organizational development • Intellectual capital management • IT management and IT integration • Quality management • Customer relationship management • Branding and brand management • Reporting and accounting Industry specific (for example) • R&D programs 	<ul style="list-style-type: none"> • Corporate governance • Risk and crisis management • Compliance systems • Corporate codes of conduct Industry specific (for example) • Specific risk management issues
Environmental	<ul style="list-style-type: none"> • Environmental policy and integration into overall strategy • Environmental charters • Responsible person for environmental issues • Environmental, health, and safety reporting Industry specific (for example) • Eco-efficient products and services (including strategy, R&D) 	<ul style="list-style-type: none"> • Environmental management systems • Environmental input and output performance • Environmental profit and loss accounting Industry specific (for example) • Hazardous substances • Environmental liabilities
Social	<ul style="list-style-type: none"> • Social policy and integration into overall strategy • Responsible person for social issues • Stakeholder involvement • Social reporting • Employee benefits • Employee satisfaction • Remuneration systems Industry specific (for example) • Community programs 	<ul style="list-style-type: none"> • Conflict resolution • Equal rights and nondiscrimination • Occupational health and safety standards • Freedom of employee organization • Standards for suppliers Industry specific (for example) • Personnel training in developing countries

cultural and regional differences. For example, there may be significant room for differing interpretations of questions by individuals within the company, and some companies may take an exaggerated rather than a more conservative approach to answering questions. Moreover, questionnaires are expensive for both parties, and feedback rates are usually low, leading to an inadequate assessment universe and information base.

Reporting documentation provided by the companies, language issues exist given the global coverage of the assessment. This issue is particularly acute with regard to Japanese companies, which often require the assessor to have all documentation translated from Japanese to English. Analysis of company documentation is also open to misinterpretation, and there is a high risk of error, exemplified by the fact that this part of the corporate sustainability assessment for the DJSI World has the highest potential for errors according to external reviews and auditor reports.¹⁶ In addition, there are cultural differences in how much information actually is recorded in company documentation.

Furthermore, conducting company interviews is very costly, and their effectiveness depends heavily on the availability and seniority of the interviewee. Thus, replicating this approach across different companies is very challenging.

The wider media and the opinion of stakeholders are used primarily to verify the truthfulness of feedback provided by companies. This process is highly efficient, given the use of modern databases and the Internet. For example, for the DJSI World, the Dow Jones Interactive database, which covers more than 45,000 media sources worldwide, is tracked daily. An important consideration for the assessment is to avoid one-sided interpretations of data.

A further challenge in gathering company information for corporate sustainability assessments is the issue of fair disclosure to all shareholders. Companies are required by law to provide all shareholders with exactly the same information so as not to give one shareholder an advantage over another. Many corporate sustainability assessments ask companies for information that they are not willing to provide to the wider financial markets, and this creates gaps in much of the feedback provided to assessors and rating agencies.

For each company in the DJSI World assessment, the input sources of information for the corporate sustainability assessment consist of the responses to an online corporate sustainability assessment questionnaire, submitted documentation, publicly available information, analysts' direct contact with companies, and/or their main clients and the media. Questionnaires specific to each DJSI World industry group are distributed via www.sasg-group.com to companies in the

DJSI World investable stocks universe. The questionnaire is designed to ensure objectivity by limiting qualitative answers through predefined multiple-choice questions. The completed company questionnaire, signed by two senior company representatives to ensure truthfulness, is the most important source of information for the assessment.

For the DJSI World, the questionnaire process has been streamlined to enable companies to answer the questions online. This interactive tool enables a company to update and change its most recent updates in the existing questionnaire and, in turn, facilitates efficient and accurate assessment by the analyst. The feedback rate of the corporate sustainability assessment questionnaire has improved from 15 percent in 1999 to 25 percent in 2001. Furthermore, the process helps to reduce the error margin of data input and interpretation by analysts.

Analyzed documents include sustainability reports, environmental, health and safety, social, and annual financial reports and all other sources of company information—for example, internal documentation, brochures, and websites. Analysts also review media, press releases, articles, and stakeholder commentary written about a company over the past year. Finally, each analyst personally contacts individual companies to clarify questions arising from analysis of the questionnaire and company documents.

Although corporate sustainability assessment information gathering depends heavily on a company's willingness to participate in the process (which is often determined by the incentive of being part of the index), the trend toward greater transparency in corporate reporting eventually will allow for more streamlined access to information and, hence, greater efficiency for both assessors and assessees.

Quantifying Corporate Sustainability Assessment Results

Quantification is clearly a major challenge in corporate sustainability assessment, the overall objective of which is to aggregate the performance of a company in terms of specific criteria into an overall sustainability performance score. Challenges exist regarding quantification of qualitative data, management of large volumes of company data, and consistent objective application of the assessment methodology

Qualitative criteria are measured via an ordinal metrics scheme, which allows the differences between companies' performances to be expressed in such a way that one company can be identified as better or worse than the next, rather than in absolute score terms. Subsequently, aggregation of the performance scores is done via the weighting of the criteria answers, the challenge being to bring the criteria into a meaningful relationship that represents the correct impor-

Table 3

Individual Criteria Weightings

Answer	Weight of Answer	Weight of Question (Question 45)	Weight of Theme (Environmental Charters)	Weight of Class Opportunities (Strategic Sustainability Opportunities)
Member of more than 3 accepted charters	100	.40	.25	.15
Member of 2-3 accepted charters	.66			
Member of 1 accepted charter	.33			
No charters signed	0			
No answer	0			

tance of a criterion relative to the overall system. Regarding the potential for subjectivity in this quantification, this is addressed by adopting the Delphi approach of accessing expert input.

Moreover, the increased use of information technologies may increase the quality of data management, capacity, and efficiency. For the DJSI World, approximately 1,000 companies are assessed yearly and monitored constantly, which requires massive data management skill to ensure effective data capture and analysis to ensure, in turn, effective quantification of corporate sustainability performance scores. Use of an extensive database and introduction of an online questionnaire enhances data security and helps to increase accuracy and data replicability and comparability.

Corporate sustainability assessment data are open to wide misinterpretations from both the assessed company and the assessor. It is vital to ensure that subjectivity is minimized while developing a company's quantified score. Using the same analyst for an entire industry group facilitates a coherent application of views. Constant internal assessor training, clear working procedures, and cross-checking by different analysts foster objectivity and accuracy of results. External audit reviews also may be used to ensure objectivity and replicability, both of which are critical factors for an index.

The corporate sustainability assessment enables calculation of a sustainability performance score for each company. Reviewing, assessing, and scoring all available information in line with corporate sustainability criteria determines the overall sustainability score for each company in the DJSI World investable universe and, subsequently, allows comparison of performance and identification of leading companies to be included in the index. In the DJSI World, corporate sustainability assessment and subsequent quantification and scoring is conducted in three stages: questionnaire assessment, quality and public availability of

information, and verification of information. This process is described briefly below:

Stage 1: Questionnaire Assessment

All answers provided in the questionnaire receive a score. Each question has a predetermined weight for the answer, the question, and the theme and class within the question.¹⁷ The total score for the question is the combination of these weights. For example (see also Table 3):

Question 45: Has your company signed environmental charters, or is it committed to the principles of sustainability councils/coalitions?

- Yes, please specify _____
- No charters signed

The weighting of each answer is automatically calculated by the SAM Information Management System and totaled to give a score for the questionnaire.

The weight of the questionnaire as an information source depends on whether the questionnaire and answers provided have been approved—in other words, signed by at least one senior management member of the company. If the questionnaire is not signed, less weight is given to the questionnaire and, accordingly, more weight is assigned to Stage 2.

Stage 2: Quality and Public Availability of Information

Company documents and publicly available information about a company are scored according to their scope, coverage, and ease of access.

The *scope and coverage* of a company's documentation is evaluated for each dimension: economic, environmental, and social. In this stage, the analyst assesses how well implementation of policies and management systems is documented across the entire company. The evaluation is scored based on the scale portrayed in Table 4.

Table 4

Level of Scope and Coverage

Level of Scope and Coverage	Score	Criteria
Low	0	No documentation or only few case studies without context or lack of worldwide coverage
Medium	1	Acceptable quality of documentation. Description of policy/management system/activity, and information about coverage in a systematic way
High	2	Good quality of documentation. Strategy, implementation of management systems, performance against targets described in detail

The *ease of access* to a company's publicly available information and documentation is evaluated for economic, social, and environmental dimensions (see Table 5). This evaluation covers all publicly available documentation as well as information provided to SAM Research for the assessment.

Stage 3: Verification of Information

Information provided in the corporate sustainability assessment questionnaire is verified to ensure that quantification of a company's sustainability performance reflects reality. The verification process assesses whether a company implements and commits to its stated policies and management practices. The verification process begins with cross-checking a company's answered questionnaire with documents provided by the company and publicly available documents, which are considered in addition to the issue of public availability of information mentioned above. In addition, the company's record is verified by reviewing media and stakeholder reports. If necessary, direct interaction and clarification with the company are also undertaken by the analyst to verify selected parts of the assessment.

For each dimension, a sample of company answers is analyzed in depth to verify truthfulness. If the answers provided by the company cannot be validated or are contradicted by information found in company documents or other publicly available documents, this is reflected in a lower truthfulness factor, which results in a lower allocation of performance scores.

Within this context, the consistency of a company's behavior and management of crisis situations is reviewed in line with its stated principles and policies. Issues such as commercial practices (for example, tax fraud, money laundering, antitrust issues, balance sheet fraud, and corruption cases), human rights abuses (for example, cases involving discrimination, forced resettlements, child labor, and discrimination against indigenous people), workforce conflicts (for example, exten-

Table 5

Level of Public Availability

Level of Public Availability	Score	Criteria
Low	0	No public information
Medium	1	Most information is for internal use, some public information exists
High	2	Most information is publicly available

sive layoffs and strikes), and catastrophic events or accidents (for example, fatalities, workplace safety issues, technical failures, ecological disasters, and product recalls) are included in this part of the corporate sustainability assessment.

In the internal review, SAM research weighs the severity of the crisis in relation to the company's reputation and crisis management quality. If the company fails to meet its stated policies and management practices as found through the review, scores may be reduced or deleted entirely for whole criteria or specific individual questions. In extreme cases, the verification process may exclude companies from the eligibility list (decided by the DJSI Index Design Committee).

Based on the three stages outlined above, a company's total corporate sustainability score is calculated. According to predefined scoring and weighting structures, answers provided on the questionnaire by the company are weighted against scores for quality and public availability and for truthfulness of information. The resulting corporate sustainability score is verified through review of a company's involvement in critical issues. A company's total corporate sustainability score at the highest aggregated level is then calculated.

Corporate Sustainability Assessment Score Formula:

- $TS = \sum [CLW * CRW * QUW * \sum AS * (QAW + DAW * DAS)] - QVS$ for all questions
- TS = Total Score
- CLW = Class Weight
- CRW = Criteria Weight
- QUW = Question Weight
- QAW = Questionnaire Assessment Weight
- DAW = Weight of Quality/Public Availability, and Truthfulness of Information
- DAS = Score for Quality/Public Availability, and Truthfulness of Information
- AS = Answer Score
- QVS = Questionnaire Verification Score

The results of the calculation outlined above are based on ordinal metrics, which means that the scores can only be used for comparison and ranking purposes, not to determine a company's absolute performance score. It is not possible furthermore to use the scoring for weighting purposes.

The calculation of the score for corporate sustainability assessment is the basis for selection of components for the DJSI World. A key focus in the future will be on how to reconcile this score with shareholder value creation or destruction.

Meeting Requirements of Traditional Indexes

An index tracking the performance of companies embracing sustainability has to meet the requirements of traditional financial indexes as far as possible, especially with regard to accuracy and reliability of data; transparency and replicability of the methodology; and processing based on rules, objectivity, and independence. In the following section, we discuss these requirements with respect to the sustainability component and information included in the DJSI World. The traditional index requirements (such as data quality for the index calculation) are not discussed at this stage because we assume they are subject to the same rigorous scrutiny as all other indexes of the DJSI index family.

To ensure *accurate and reliable data*, the DJSI World is reviewed quarterly and annually to ensure that the index composition accurately represents the top 10 percent of leading sustainability companies in each of the DJSI World industry groups. Various Information Technology (IT) systems help to increase data quality, verification systems are used as described earlier, and quantified proxies of qualitative information are designed to enable data accuracy and reliability.

Moreover, to ensure quality and objectivity, an external audit and internal quality assurance procedures, such as cross-checking information sources, are used to monitor and maintain the accuracy of the input data, assessment procedures, and results. In addition to quarterly and annual reviews, the DJSI World is continually reviewed for changes to the index composition necessitated by extraordinary corporate actions—for example, mergers, takeovers, spin-offs, initial public offerings, delistings, and bankruptcy—affecting the component companies and their corporate sustainability performance. Finally, corporate sustainability monitoring is part of the ongoing review process. Once a company is selected as a member of the DJSI World, its corporate sustainability performance is monitored continuously.

With regard to *transparency and replicability of the methodology*, each of the Dow Jones Sustainability Indexes is accompanied by publication of a guidebook¹⁴ outlining all of the decisions that have been made in development of the

DJSI, especially in terms of meeting all of the challenges mentioned in this paper. It includes the corporate sustainability methodology, index features and data dissemination, periodic and ongoing review, the calculation model, and the management and responsibilities of all parties involved. In addition, the primary research of the DJSI World is based on a consistent rule-based methodology, the details of which are transparent via web publication.

To ensure *objectivity and freedom of bias toward companies and investors* for an independent and accurate corporate sustainability assessment and index construction, all processes are reviewed by an external, independent auditor for the DJSI World. An average error margin for the corporate sustainability performance assessment is determined by reviewing a representative random sample of 25 companies among the upper half of the companies that were not selected because of relatively low corporate sustainability performance scores and the lower half of companies selected for the DJSI World. The average error margin in 1999 was 0.55 percent, 0.72 percent in 2000, and in 0.74 percent in 2001.

Free availability of data is assured by publication of all details related to the corporate sustainability questionnaires, criteria groups, weightings used for scoring aggregation purposes, overall results, and index components.

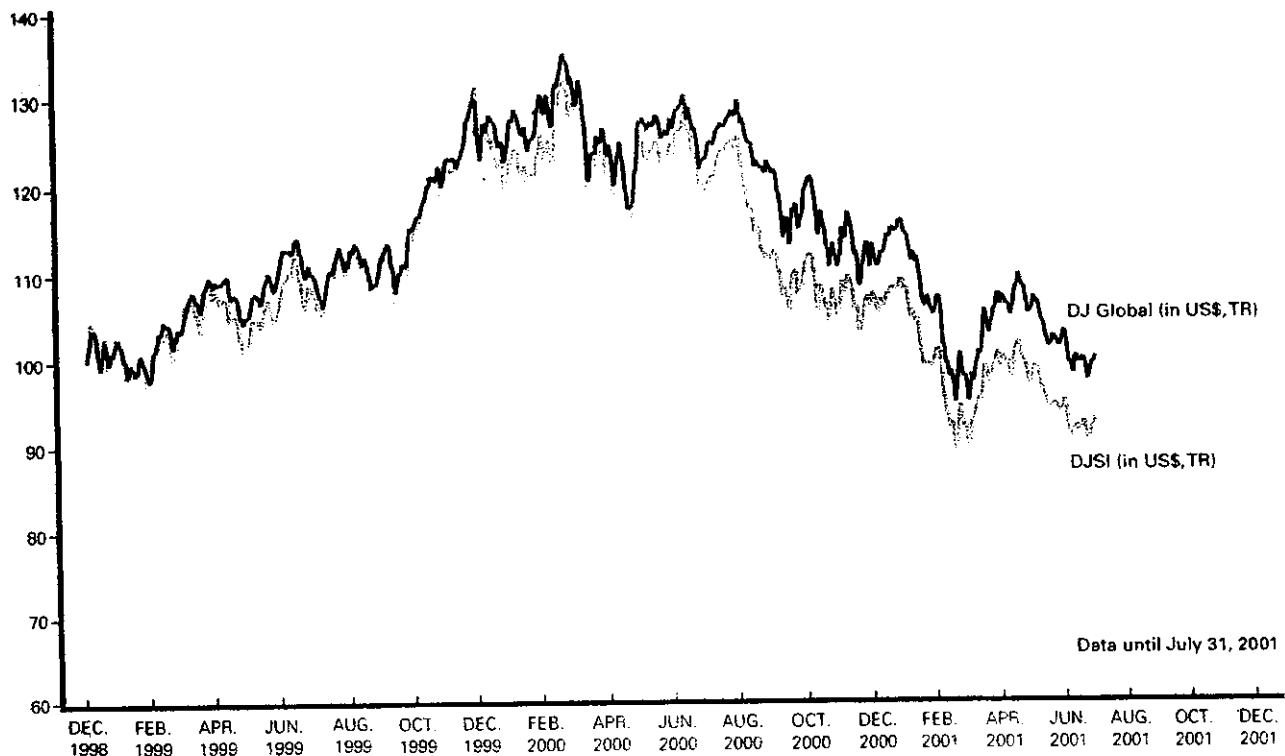
Finally, to ensure that the index assessment is *independent and objective*, the DJSI World has established two important committees. First, the DJSI World Index Design Committee is solely responsible for all decisions on the composition and accuracy of the DJSI World. In particular, the DJSI World Index Design Committee is solely responsible for all changes to the index methodology, which is detailed in the current DJSI World Index Guide. Second, the DJSI World Advisory Committee is composed of independent, third-party professionals from the financial sector and corporate sustainability performance experts. The Advisory Committee advises the DJSI World Index Design Committee on index composition, accuracy, transparency, methodology, and the corporate sustainability performance assessment in line with the latest DJSI World Index Guide.

Thus, there are many challenges in assessing, measuring, and quantifying corporate sustainability, and the DJSI World approach has been devised expressly to address these challenges.

In the next section, we examine the risk and performance attributes of the DJSI World to determine the value and viability of developing an index tracking the financial performance of sustainability leaders as a whole.

Figure 2

Performance of the DJSI World and the DJ Global



Risk and Performance Attribution of the Dow Jones Sustainability World Index

The Dow Jones Sustainability World Index was launched in 1999 to track the performance of companies that lead in corporate sustainability. According to the DJSI World, an investment in the companies leading in corporate sustainability would have yielded a cumulative negative return of -6.9 percent, or -2.7 percent per year in U.S. dollars. Volatility hovered at around 18 percent for the first 14 months, before dropping to some 16 percent for the last 10 months. As could have been expected, the sustainability leaders thus were not immune to the general downturn in equity prices the world has experienced since mid-2000.¹⁶

Aggregate performance is generally of less interest than a detailed analysis of its causes. After all, the negative performance may be due to factors unrelated to sustainability. Performance attribution, as it is called, is usually most revealing when compared to some other universe's indicator. It is tempting to compare the DJSI World to some general global indicator, such as the Dow Jones Global Index (DJ Global), a broad index comprising more than 5,000 companies around the world. We will use it for comparison here because the broader an index is, the less overlap there is. This may help in distinguishing sustainability factors from other factors. In addition, the DJ Global is calculated using free-

float adjustments that are comparable to the methods used for the DJSI, making it a more suitable partner than the MSCI World Indexes.

Comparing Performance

Figure 2 indicates how the two indexes have fared in comparison. From inception of the DJSI World until the end of July 2001, the DJ Global has fared better than the DJSI, losing all, but not more than, its interim gains.

Relative performance needs to be compared on an all-things-being-equal basis, if any specific claim is to be judged. Portfolio theory answers the question of what makes such comparisons by adjusting historic returns for the risks incurred. Since 1999, the DJSI World has displayed an annual volatility of 17.12 percent, while the DJ Global has had an annual volatility of 15.27 percent (see Table 6). The DJSI World has thus been more volatile. If this volatility is an unbiased reflection of the risks incurred, then the difference in volatility is big enough to warrant risk-adjusted return measurement. One risk-adjusted measure of performance is the Sharpe ratio, which relates the return a portfolio earned, above what an appropriate risk-free alternative could have earned, to the volatility experienced. Since 1999, the annual returns of the DJSI World and the DJ Global have been -2.7 percent and 0.0 percent, respectively. We assume the average

Table 6

Return and Risk Comparison

since 1999, total returns in US\$

	DJSI	DJ Global	Difference
Volatility	17.1%	15.3%	1.8%
Return	-2.7%	0.0%	-2.7%
Risk-free rate*	4.0%	4.0%	—
Excess return	-6.7%	-4.0%	-2.7%
Sharpe ratio	-0.39	-0.26	-0.13

*Average of global eurocurrency rates.

risk-free rate to have been 4 percent, which yields a Sharpe ratio of -0.39 for the DJSI World and of -0.26 for the DJ Global.

Yet, calculating Sharpe ratios alone does not provide for a true all-things-being-equal basis. Nor is a comparison of Sharpe ratios sufficient to draw conclusions about the sustainability case. Three aspects need to be considered when dealing with relative performance. They are differences in exposure to common factors, differences in exposure to specific factors, and pure chance.

Exposure to Common Factors

Over any period, two indexes will be influenced to different degrees by common factors unless their composition is completely equal. Comparison of the composition of DJSI World with that of the DJ Global as of July 31, 2001, reveals that they were far from equal (see Table 7). First, companies in the Eurozone make up 23 percent of the DJSI World, compared with some 13 percent in the DJ Global. U.K. companies account for 19 percent of the DJSI World, but less than 10 percent of the DJ Global. In turn, Japanese companies account for only 6 percent in the DJSI World, while they account for 10 percent in the DJ Global. U.S. companies account for less than 40 percent in the DJSI World, but 60 percent in the DJ Global. There is thus a strong representation of European companies in the DJSI World, at the expense of Japanese and US companies.²⁰

The excess weight of some 10 percent in Eurozone companies implies that the Euro has greater influence on DJSI World's return than on the DJ Global's return. Indeed, some 2 percent of the DJSI World's cumulative underperformance of 6.9 percent can be attributed to the Euro's 25 percent decline during that period.

Currency impacts can be controlled for, in part, by calculating indexes on a hedged basis. Other unequal impacts of common factors are much more difficult to control for. One

Table 7

Country Allocation of Dow Jones Sustainability Index

Country/Currency Allocation (without Emerging Markets)

as of July 30, 2001

	DJSI	DJ Global	Difference
Australia/New Zealand	1.03%	1.40%	-0.37%
Canada	2.24%	2.19%	0.05%
Denmark	0.38%	0.27%	0.11%
Euroland	22.78%	12.83%	9.95%
HK/Singapore	0.51%	1.14%	-0.63%
Japan	6.42%	10.02%	-3.60%
Norway	0.23%	0.13%	0.10%
Sweden	0.98%	0.83%	0.15%
Switzerland	8.13%	2.53%	5.60%
U.K.	18.91%	9.81%	9.10%
U.S.	38.38%	58.85%	-20.47%

example is the overweight in large-cap companies. The DJSI World has a much higher percentage of companies with large market capitalization than does the DJ Global. This difference in composition can hardly be controlled for. The significant overweight of large-cap stocks is caused by the assessment process, which starts from a universe of the 2,500 largest companies worldwide. Some 2,500 small caps that are members of the DJ Global are not assessed. Over periods during which large-cap companies do relatively better than small caps, the DJSI World does relatively better than the DJ Global. The opposite is true as well: there are periods where small caps do relatively better than large caps, as has been the case since January 1999, so the DJSI World will do worse than the DJ Global. At least 1.8 percent of the cumulative underperformance of the DJSI World since its inception can be attributed to this difference in composition.

The DJSI World also has an above average number of "growth" companies—that is, companies that tend to reimburse investors in capital gains rather than in dividends (see Table 8). Whether "growth" is a true characteristic of the sustainability universe is hard to assess. It is tempting to attribute the overweight in "growth" companies to the notion that sustainability companies are embracing global change and seeking opportunities to profit from it, so they find investment opportunities where companies not integrating sustainability considerations do not. This would justify an above average number of "growth" companies. Yet, this explanation is not necessarily the only one possible. In any case, in times when "value" companies outperform "growth" companies, the DJSI will lag the DJ Global. The small overweight in growth stocks has caused another 20 basis points of cumulative underperformance since inception.

Table 8

Risk Factors in the Index

Allocation According to Aegis Global Equity Risk Model™ Factors (without Emerging Markets) percent of standard deviations of developed markets universe, as of July 30, 2001

	DJSI	DJ Global	Difference
Size	19.80%	-39.80%	59.60%
Success	0.00%	5.20%	-5.20%
Value	2.60%	4.10%	-1.50%
Variability in Markets	9.80%	14.60%	-4.80%

Aegis Global Equity Risk Model™, Barra Inc.

Exposure to Specific Factors

The "best-in-class" approach applied to the sustainability universe leads to a small number of companies comprising the index. On July 31, 2001, the DJSI World comprised 225 companies, while the DJ Global comprised 5,029. Thus, each company included in the DJSI World carries considerably more weight than in the DJ Global. This makes the DJSI World a less diversified universe and, thus, more vulnerable to specific factors.

Mispricing of companies and corrections of their mispricing is one such factor. The DJSI World is composed as a price index, as equity indexes usually are. Value-based indexes are rare because of the difficulty of assessing intrinsic value. Examples of value-based indexes are trade-weighted currency indexes based on purchasing power parities. Price indexes by definition cannot consider valuation. In addition, the DJSI World selects the leading companies with regard to their market capitalization. If the market capitalization is affected by severe mispricings, and there is no reason why leading companies embracing sustainability should be shielded from mispricings, the DJSI will tend to include the more severely mispriced companies within an industry, as long as the sustainability rating is comparable. The impact of a correction of the mispricing of these companies on the DJSI, therefore, is larger than the impact of the industry-wide correction on the broader index.

Mispricings and their subsequent corrections on the stock level have indeed been affecting the DJSI World. Lucent Technologies and EMC Corp. are two examples. In the 22 months of its membership in the DJSI World, Lucent alone accounted for a cumulative underperformance of 1.9 percent. EMC Corp. accounted for 2.9 percent of the relative underperformance during its nine months of membership alone. The performance of Lucent Technologies and EMC Corp. was not related to their sustainability rating, but to the recent IT bubble, so the DJSI World had no means of excluding them, regardless of their mispricing.²¹

Chance

As an unbiased measure of valuation and performance of the sustainability sector, the DJSI World is inevitably prone to be taken as "evidence" for or against the hypothesis of a sustainability business case. Interpreted as a portfolio, it will be expected to outperform comparable portfolios, at least in the long run. The reasoning behind this expectation is sound, as mentioned earlier. A portfolio or index of leading companies that embrace sustainability can be expected to appreciate faster than a portfolio or an index of companies that do not address profitable investment opportunities. Investments in such companies promise higher returns and, due to lower business risk, better risk-return ratios. Better performance can thus be expected on a risk-adjusted basis.

Unfortunately, the DJSI World will never be able to prove this reasonable expectation in relation to a comparable index. First, the issue of comparability will remain unsolvable. Different exposures to common factors can never be fully controlled for, and the influences exerted can take many years to even out. Second, specific factors come into play when index membership is restricted to the leaders within a universe. Third, the impact of pure chance, inherent in any investment, can override a sound investment case. As soon as chance has to be taken into account, statistical methods have to be used to decide for or against a case. The usual expectation is that the underlying value-added will persist sooner or later and will override all adverse chance influences, and perhaps even different exposures to common factors. Little consideration is given to the amount of time and the number of observations needed to make statistical methods applicable and enable them to detect significant differences in performance.

In fact, the number of observations needed for supporting any claim of "value-added" is uncomfortably large. For the moment at least, the index cannot help to determine whether investing in companies embracing sustainability is worthwhile. It may never do so. Nevertheless, the overall rationale behind this investment thesis is sound. Sustainability may be claimed to produce higher-than-average returns on a risk-adjusted basis. On a before-the-fact basis, portfolios comprising sustainable companies thus may be labeled "better" investments, with "better" defined in risk-return space, even when the index or the portfolio fails to deliver on the promise after a relatively short period of time.

Conclusion

To assess the importance and success or failure of sustainability indexing and investing, it is crucial to keep the primary goal of sustainability investing in mind—the identification of companies that are best positioned to profit from trends that are redefining the basis for business success. Clearly, the competitive rules affecting industries and businesses are shifting to the company's management of risk and

opportunity derived from economic, social, and ecological trends. Leading companies addressing sustainability therefore derive competitive advantage while also reinforcing the likelihood of these trends becoming reality. Sustainability investing and indexing's "best-in-class" approach aim to identify the leaders. Promoting the fact that competition, in the Schumpeterian sense, is healthy and a driver for continuous innovation shows that this approach addresses one of the basic tenets of our market economy. Therefore, sustainability investing and indexes tracking the performance of leading companies in terms of sustainability are particularly appropriate as an investment hypothesis, compared with negative screening approaches designed to allow investors a direct expression of their personal ethical values.

Concerning the methodology for assessing corporate sustainability, there are a number of key challenges. Assessment of corporate sustainability is a very new concept, a lengthy history on which to base judgments is lacking. The assessment methodology described in this paper is a work in progress, and improvements must be made to align the content toward criteria that better reflect companies' performance and risk attributions. Furthermore, regional particularities will be given increasing prominence as specialized regional and emerging market assessment approaches are developed.

Moreover, there is a distinct dearth of scientific evidence to support the tenets of the sustainability investing hypothesis and approach. Increased collaboration among academia, science, and business should be promoted to close this gap. This cooperation between the sciences and the private sector will also provide the background for the much-needed standardization of corporate sustainability reporting.

Finally, it is premature to draw definitive conclusions regarding the business case for sustainability. As discussed, a much longer time frame is needed to attribute index or fund performance to particular sustainability criteria or strategies. Evidence regarding a positive impact of sustainability on outperformance of an index is not conclusive. However, available empirical evidence supports the view that sustainability investing has not led to a long-run-adjusted underperformance versus a conventional approach. Measured over shorter periods, risk-adjusted sustainability performance deviates from a conventional approach. Currently, investment biases (such as a regional bias or a slight growth tilt) are potentially the dominating driver of risk-performance differences. Therefore, it is possible to attest that companies that pursue sustainability do not underperform the wider market in the longer run, although they very clearly deliver major benefits to society and the environment as well as contributing positively to the vibrancy of the overall economic system. The fact that an index

incorporating companies that lead in their approach to sustainability shows no negative effects on risk performance and may in fact, highlight hidden social, ecological, and economic value, explains the dramatic increase in interest in sustainability investing in recent years.

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Endnotes

- 1 With assistance from Erica Tucker-Bassin and Colin le Duc.
- 2 www.sustainability-index.com
- 3 www.kid.com/benchmarks/dsi.html
- 4 www.ftse4good.com
- 5 Under the terms of Pensions Act amendments that took effect on July 3, 2000, Britain's pension funds will be required to disclose whether they take full account of the environmental, social, and ethical impact of their investments.
- 6 As promulgated in the Federal Law Gazette, *Gesetz zur Reform der gesetzlichen Altersversicherung und zur Förderung eines kapitalgedeckten Altersvorsorgevermögens (Altersvermögensgesetz AvvM/G)*, Bundesgesetzblatt Teil I, 29.06.2001, 1310.
- 7 Australian Senate Table Office, *Senate Bills List 2001*, p. 40.
- 8 SSGA, *State Street Global Advisors announces CHF 500 million SRI mandate win from Swiss Federal Social Security Fund*, press release, May 21, 2001.
- 9 The United Nations General Assembly established the World Commission on Environment and Development in 1984, also known as the Brundtland Commission (after chair Gro Harlem Brundtland).
- 10 www.stoxx.com
- 11 The DJSI World is produced by SAM Indexes GmbH, a collaboration between Sustainable Asset Management and Dow Jones Indexes. The main function of SAM is to provide the research, while Dow Jones Indexes conducts the calculation and distribution functions for the DJSI.
- 12 www.sustainability-indexes.com/djsi_world/guidebook.html
- 13 www.sustainability-indexes.com
- 14 SAM internal studies to assess the efficiency of the corporate sustainability assessment methodology.
- 15 www.sustainability-indexes.com
- 16 PricewaterhouseCooper's audit letter of August 31, 2001, at www.sustainability-index.com
- 17 www.sustainability-indexes.com for full disclosure of questions and weightings in the assessment process.
- 18 www.sustainability-indexes.com/djsi_world/guidebook.html
- 19 This section has been contributed by Mr. Thilo Goodall.
- 20 It is unlikely, however, that U.S. companies lag others in sustainability to the degree indicated by these figures. Indeed, the construction process may account for part of the U.S. underweight.

The "best-in-class" approach, with "class" defined as an industry or industry group, is one of the characteristics distinguishing sustainability from other approaches. The approach clearly stresses industry specifics, allowing for a fair comparison within industries, while acknowledging the difficulties of comparing companies across industries. Focusing on industry strata can have an impact on country strata, if sustainability is distributed unevenly across industries within a country. Therefore, no direct inference should be made to the regional distribution of leading companies embracing sustainability.

- 21 Relative price movement across strata can thus shift the composition of the index if the relative movements are more pronounced in the index than in the entire universe. This has been the case and experience to date with the DJSI World. Large caps have corrected more than small caps since August 2000, and information technology and telecommunication companies have seen their prices slashed much more than those of companies from other sectors. U.S. companies provide large percentages of both large caps and of technology companies, so that about 6 percent of the current underweight in U.S. companies can be attributed to relative price movements since inception of the DJSI.