

**Indexation: Securities Indices and Index Derivatives**



**IOSCO**

**Report of the Technical Committee  
of the  
International Organization of Securities Commissions**

**February 2003**

## **Executive Summary**

In this report, the Technical Committee reviews the issues raised for market regulators by the increased influence of index-related investment strategies and index-related products on the orderliness and efficiency of secondary markets and considers whether current IOSCO recommendations in this area require modification.

The Technical Committee approved this report during its 17 and 18 February 2003 meeting. This project originated when the Technical Committee mandated in May 2002 its Standing Committee on the Regulation of Secondary Markets (SC2) to prepare a report on the indexation of securities indices and index derivatives. The report reviews the continuing relevance and adequacy of IOSCO's 1992 recommendations in respect of index derivative contract design and, additionally, its observations on possible measures to address the interaction between index derivative and underlying cash markets in periods of market stress. It also considers other key market issues relating to indices, in particular the index rebalancing process and the methodologies for arriving at the expiry price for index derivative contracts. Finally, it notes the issue of whether the significant increase in index-related investment strategies may be having any more general influence on the orderliness of the cash markets and the quality of pricing of equity securities.

The Technical Committee's main conclusions are as follows.

- The increased use of indices, and the significant dependence of markets on information relating to indices, requires the maintenance of adequate levels of transparency, including effective contact between market operators and, where separate, index providers and active disclosure by market operators of relevant information they obtain from index providers.
- Market operators should, where possible, actively pursue, through information-sharing, discussion and co-operation with relevant parties, including regulatory authorities, other market operators and index providers, the development of any microstructure measures that would reduce the risk of disorderly markets flowing from trading activity relating to index events.
- The 1992 contract design criteria for index derivatives continue to provide an appropriate and flexible framework for the development of stock index products. but they would benefit from a number of revisions to stress the importance of transparency of information relating to indices and index events, to clarify the application of the recommendations on the dispersion and numbers of component stocks in an index, to emphasise the likely need for

enhanced surveillance where design criteria are not fully met, and to add clarity to the recommendations on clearance and settlement.

- The growth in the use of index derivatives emphasizes the need for regulators to ensure that there are satisfactory arrangements for monitoring related activity in cash and derivative markets and effective information-sharing and cooperation between markets and market authorities.
- The increasing development and use of less diversified indices and indices based on securities from multiple markets add a further dimension to the matters outlined above and require market regulators to ensure the sufficiency of surveillance arrangements.
- In considering the broader implications of the increasing use of index-tracking and index derivatives, the Technical Committee has found no substantive evidence of developments that raise issues of systemic concern but recognises that indexation has become a significant factor in today's markets and one that market authorities should monitor and continue to analyse.

## A. Introduction

### Background and purpose

Indices and index-related products have come to play an increasingly significant part in today's market-place. While they provide valuable tools for market users, they also raise a number of issues for regulators.

In light of the introduction of new products, the adoption in some member jurisdictions of new legislation and rules to address the use of these products and the increased interest in the impact of index products on financial market stability<sup>1</sup>, the Technical Committee considers it an opportune time to review IOSCO's current recommendations in this area and address any related issues of concern to regulators that have arisen since.<sup>2</sup>

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<sup>1</sup> The Financial Stability Forum ('FSF'), following requests by certain of its membership to include the impact of indexation in its work on financial vulnerabilities, invited IOSCO to express its views on issues raised by indexation. Responding on behalf of the Technical Committee, the Standing Committee on the Regulation of Secondary Markets (SC2) agreed with the proposition that the use of indices presents issues that regulators and market authorities responsible for securities market surveillance and oversight should continue to study.

<sup>2</sup> SC2's mandate appears in Appendix 1. In respect of index derivatives, the project is limited to derivatives (i.e., futures and options) products based on indices comprised of equity securities, similar products related to equity indices (e.g. covered warrants), and exchange-traded funds ("ETFs") that track the performance of equity indices. It does not include derivative contracts or other products based on indices comprised of debt securities or other instruments.

A central part of the Technical Committee's recommendations in this area are the two papers forming its 1992 report on 'Coordination between Cash and Derivative Markets' (*the 1992 Report*). The first paper, 'Contract Design of Derivative Products on Stock Indices' (*Contract Design Paper*), focused on the characteristics of stock indices underlying related derivative products that regulators and market authorities should consider in assessing stock index contracts. The second paper, 'Measures to Minimize Market Disruption' (*Market Disruption Paper*) addressed concerns about interactions between cash and derivative markets and described measures undertaken by the member countries to address rapid market declines.<sup>3</sup>

The focus of this project is therefore on market issues arising from the design and maintenance of indices, from the design and operation of derivative contracts and other new products related to indices, from the interaction of derivative and cash markets and from the more general impact of indexation on market dynamics. It addresses issues only as they impact markets.

Readers of this report should bear in mind that in the jurisdictions of most members index provision is not a regulated activity and that no SC2 members are currently proposing any change in that position.

### **Survey and literature review**

As a first step, SC2 surveyed members'<sup>4</sup> current regulatory frameworks and practices with respect to contract design and market coordination measures, collated responses and noted similarities and differences. The survey also sought both to identify any systemic or other supervisory issues raised by indexation, by the rebalancing of indexes and by the trading of derivative products based on securities indices, and to assess the use of the regulatory measures available to minimize market disruption. Survey responses, together with a number of case studies prepared by members, are included in the appendices to this report.

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<sup>3</sup> The chairman of SC2 responded to the FSF on behalf of the Technical Committee in a letter dated 19 March 2002. (See Appendix 2).

<sup>4</sup> The Standing Committee members are: Australian Securities and Investments Commission; Comissao de Valores Mobiliarios, Brazil; Commission des valeurs mobilières du Québec, Québec, Canada; Ontario Securities Commission, Ontario, Canada; Commission des Operations de Bourse, France; Bundesanstalt für Finanzdienstleistungsaufsicht, Germany; Deutsche Bundesbank, Germany; Securities and Futures Commission, Hong Kong; Commissione Nazionale per le Società e la Borsa, Italy; Financial Services Agency, Japan; Securities Commission, Malaysia; Comision Nacional Bancaria y de Valores, Mexico; Securities Board of the Netherlands; Monetary Authority of Singapore; Comision Nacional del Mercado de Valores, Spain; Finansinspektionen, Sweden; Swiss Federal Banking Commission, Switzerland; Commodity Futures Trading Commission, United States of America; Securities and Exchange Commission, United States of America; Financial Services Authority, United Kingdom.

SC2 also involved the IOSCO Self-Regulatory Organizations' Consultative Committee ('the Consultative Committee') to ensure that it covered, amongst other things, current market design and coordination practices and benefited from the latter's experience in this area. A synopsis of replies from Consultative Committee members is provided in Appendix 8.

Additionally, SC2 has conducted a review of the academic literature addressing the impact of index products on cash market volatility. This is reviewed in section C of the report.

### **Structure of paper**

The remainder of this report is organized as follows:

**Section B** describes the evolution and main uses of indices, discusses index-linked trading in today's markets and lists the main issues that arise for regulators.

**Section C** considers issues around index design and process management, including index rebalancing procedures.

**Section D** examines the development of index-driven investment strategies, including new products related to indices, and considers whether this poses new issues for market regulation.

**Section E** focuses on index derivatives, reviews IOSCO's 1992 recommendations on contract design and measures to minimise market disruption.

**Section F** contains the report's conclusions and recommendations.

Attached to the report are a number of appendices. These are as follows:

Appendix 1 sets out the mandate for this report;

Appendix 2 is the letter sent by the SC2 chairman to the chairman of the Financial Stability Forum;

Appendix 3 contains the 1992 reports

Appendix 4 provides a list of the main domestic and international indices in use in SC2 member jurisdictions;

Appendix 5 presents a summary of the relevant regulatory framework in SC2 member jurisdictions;

Appendix 6 provides case studies on index rebalancing and index expiry issues;

Appendix 7 is a compilation of the survey responses from SC2 members;

Appendix 8 presents a synopsis of responses provided by IOSCO Consultative Committee members;

Appendix 9 provides academic literature references;

Appendix 10 provides some statistics.

## **Terminology**

The word ‘regulator’ is used in this report to refer both to statutory market regulators and other officially-recognised bodies that may have regulatory responsibilities for market regulation without being market operators themselves. ‘Market operators’ generally have responsibility for rule-setting and monitoring in the markets they operate, but in a few jurisdictions some of these responsibilities are, at least in part, separated from the market operator. The words ‘market’ and ‘exchange’ are used in a broadly synonymous sense to market operator.

## **B. The growing role of indices and index products**

### **B. 1. Introduction**

Stock market indices - essentially a method of measuring the changing value of a group of securities over time<sup>5</sup> - have existed since the late nineteenth century, when they were first developed as relatively simple measurement tools for groups of securities. In 1896, Charles Dow created one of the earliest U.S. stock market indices, the Dow Jones Industrial Average (“DJIA”). At its inception, the DJIA comprised 12 industrial stocks. Currently, it comprises the stocks of 30 actively traded industrial, financial, and service companies. A number of other countries developed indices during the 1930s and most have had indices since the 1950s or 1960s.

Today, exchanges, brokerage firms, rating services, and other index providers develop and maintain a large range of stock market indices. These include national stock market indices, multi-country regional and global indices, indices that represent broad market sectors (e.g., industrials), and indices that represent particular industries (e.g., electronics). There are also indices that measure segments of markets, e.g., the markets for large-, middle-, and small-capitalization

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<sup>5</sup> The level of a stock market index is expressed in relation to a base determined when the index is established. Index calculation methodologies and changes to index constituents (‘rebalancing’) are described in greater detail in section C.

stocks, as well as style indices.<sup>6</sup> In addition to widely published and disseminated indices, some index providers create customized indices for internal use by fund managers and some financial firms operate their own indices to support the development of index-related products. A list of the major indices in SC2 member jurisdictions can be found in Appendix 4.

This growth in indices, particularly over the past two decades, has given them a significant role in today's market-place. No longer are they simply measures of the performance of particular markets. As described in the rest of this section, they have become central to asset allocation and performance measurement among investors and provide the basis for a vast range of investment funds and derivative instruments.

## **B. 2. Main roles of indices**

Indices perform several functions. In addition to measuring stock market performance, indices may, among other things, serve as a performance benchmark for active fund managers, assist in asset allocation, and provide a basis for various investment vehicles, including index-based mutual funds ("index funds") and exchange-traded funds ("ETFs"). In addition, indices can underlie futures and options.

### **a. Index funds**

An index fund is a type of mutual fund whose investment objective is typically to achieve the same return as a particular market index. The first index funds appeared in Japan, in the late 1960s. An index fund attempts to achieve its investment objective primarily by investing in the securities of companies included in the index. Some index funds invest in all of the companies in the index, while others invest in a representative sample. The management of funds that fully replicate an index is essentially "passive" in that the fund manager's objective is solely to hold the securities comprising the index in the same weightings in which they are represented in that index.. This translates into low trading activity – which is concentrated at index rebalancings - and lower fees and expenses than for actively managed funds. However, pure passive index fund management is not the most common type. Active index fund managers aim at improving on index performance by holding securities forming the index being replicated but with a different weighting and supplemented with additional securities. This entails higher trading activity than a passive indexation strategy.

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<sup>6</sup> There are two primary types of style indices: growth and value indices. In general, value indices are comprised of stocks that are priced relatively cheaply based on their current earnings, while growth indices are comprised of stocks with relatively high prices (compared with current earnings) that are expected to grow strongly. The criteria for classifying a stock as "value" or "growth" varies among index providers. Style indices may be used for asset allocation purposes or as a benchmark for active fund managers with a value or growth investment style.

Investment in index tracking strategies has grown significantly in recent years - though there are signs that this has slowed through the recent bear market<sup>7</sup> - and in many countries now represents a material proportion of total investment. In the U.S., for example, inflows into equity index funds grew from \$1.8 billion (14% of total equity fund inflows) in 1990 to \$54.3 billion (28.9% of total equity fund inflows) in 1999.<sup>8</sup> In 2000, the inflows dipped to \$21.63 billion (7.0% of total equity fund inflows).<sup>9</sup> The total assets held by index funds are even more significant. For example, according to a Standard & Poor's survey of institutional investors, assets passively invested in the S&P 500 Index totalled approximately \$870 billion in 2000 and fell to approximately \$695 billion in 2001. Other research indicates that as of June 30, 2000, U.S. institutional tax-exempt investors had \$1.68 trillion in domestic and global indexed assets, and that, as of June 30, 1999, continental European managers had over \$90 billion in European indexed assets.<sup>10</sup>

## **b. Exchange Traded Funds**

ETFs are funds that hold portfolios of securities designed to track the performance of various indices. Unlike a typical open-ended mutual fund or unit investment trust, an ETF issues shares that are redeemable only in large blocks. Individual ETF shares trade on securities exchanges, which allows investors to purchase and sell individual ETF shares at market prices throughout the day.<sup>11</sup> As a result, ETFs provide investors with the diversification benefits of a fund and the trading flexibility of stock. Investors may purchase ETF shares as a long-term investment for asset allocation purposes or as part of a market timing investment strategy.<sup>12</sup> In addition, institutions may purchase ETF shares to facilitate hedging strategies or because of investment restrictions that preclude investment in index derivatives.<sup>13</sup> They may also prefer ETF shares to index futures because ETF shares do not expire or have the margin requirements of futures contracts.

The assets invested in ETFs have grown significantly since the first ETF was launched on the Toronto Stock Exchange in 1989. For example, in the U.S., the

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<sup>7</sup> Trends may also be affected by changes in the investment mix, e.g. some switching into newer products such as exchange-traded funds.

<sup>8</sup> See Jim Wiandt, *Passive Investing Trends: Chasing Returns or Investing on Merit?*, indexfunds.com, October 5, 2001, at [http://www.indexfunds.com/PFarticles/20011005\\_inflow\\_iss\\_gen\\_JW.htm](http://www.indexfunds.com/PFarticles/20011005_inflow_iss_gen_JW.htm).

<sup>9</sup> Id.

<sup>10</sup> See John Spence, "Index Fund Popularity Waning?," indexfunds.com, February 28, 2001, at [http://www.indexfunds.com/articles/20010228\\_EatonVance\\_iss\\_gen\\_JS.htm](http://www.indexfunds.com/articles/20010228_EatonVance_iss_gen_JS.htm).

<sup>11</sup> It is also possible to open a short position in an ETF.

<sup>12</sup> See Securities Exchange Act Release No. IC-25258 (November 8, 2001), 66 FR 57614 (November 15, 2001) (concept release regarding actively managed ETFs).

<sup>13</sup> Id.



total net assets of ETFs grew from \$1.05 billion in 1995<sup>14</sup> to \$100.73 billion as of October 2002.<sup>15</sup> In Europe, where ETFs arrived more recently, the estimated figure at end August 2002 was \$8.7 billion<sup>16</sup>. As of October 2002, the total net assets of ETFs in Australia, Japan and Singapore stood at A\$389 million, \$19.1 billion and S\$86 million respectively.<sup>17</sup>

### **c. Stock index futures and options**

Stock index futures and options began trading on U.S. exchanges in the early 1980s and shortly thereafter in other markets. Market participants use stock index futures and options for a variety of purposes, including, among other things, hedging, speculation, asset allocation, and arbitrage.

Stock index futures and options allow market participants to hedge against market risk. For example, a portfolio manager may sell index futures, reducing the overall exposure of his or her portfolio to stock price movements and shifting that risk to a market participant more willing to accept it. This is particularly useful in enabling a fund manager to cover large exposures without needing to sustain (the often higher) costs of dealing in the underlying.

Because an index option or future is a single instrument that can be used as a surrogate for a portfolio of stocks, a portfolio manager may also use stock index futures or options to adjust stock and debt portfolios quickly and at relatively low commission costs. For example, a manager can convert a debt portfolio to equity by simultaneously selling bond futures and buying stock index futures.

Speculators, who assume risk in an attempt to profit from changes in the values of derivatives or the underlying instruments, may use derivatives as a more affordable way to attempt to profit from anticipated price movements. A further active participant in this market is the arbitrageur, who seeks to lock in profits when the price of the index derivative and the securities underlying it move out of line with each other.<sup>18</sup>

In many countries trading volumes in exchange-traded equity index futures and options have become significant. For example, the year-to-date trading volume for equity index options in the U.S., as of October 2002, was 59.3 million contracts.<sup>19</sup> For the same period, the trading volume for equity index options (including equity index futures options) was 4.6 million contracts in Spain, 1.4

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<sup>14</sup> ETFs began trading in the U.S. in 1993. Futures on ETFs began trading in 2002.

<sup>15</sup> See Appendix 10.

<sup>16</sup> Morgan Stanley research.

<sup>17</sup> See Appendix 10.

<sup>18</sup> Typically, an arbitrageur will lock in a profit by selling the dearer of an index future and the underlying securities and simultaneously buying the cheaper of the two.

<sup>19</sup> See Appendix 10.

million contracts in Brazil, and approximately 803,000 contracts in Hong Kong.<sup>20</sup> Similarly, as of October 2002, the year-to-date trading volume for index futures was 8.5 million contracts in Singapore, 4.9 million contracts in Brazil, and 3 million contracts in Australia.<sup>21</sup> In addition, there is significant trading of OTC index derivatives in some countries.

#### **d. Other index related products**

Recent years have also seen growth in other derivative products based on indices. These include covered warrants, a form of derivative issued by banks or other approved institutions over shares or a basket of different shares, a share price index, currencies, or commodities. Covered warrants may replicate the functioning of basic call and put options and more complex options. In addition, financial institutions have also issued certificates (as securities) that allow an investor to invest in indices (or other assets) by simply replicating the price of the underlying assets. Covered warrants and certificates are usually listed on stock exchanges and traded and settled as securities. In some jurisdictions, these products are not considered as derivative instruments.

In Canada, sponsored options are a financial derivative issued by the Canadian Derivatives Clearing Corporation (CDCC) and sponsored by financial institutions approved by the *Bourse de Montréal Inc.* They are highly liquid options issued on Canadian and international equities, stock indices and exchange-traded funds.

### **B.3 Main regulatory issues raised**

While indices, indexation and index derivatives benefit markets and market users, they also raise regulatory issues relating to:

- the structure of indices used for derivative contracts and other investment products;
- the design of index derivative contracts;
- the interaction between derivative and cash markets;
- the co-ordination of oversight of derivative and cash markets;
- the potential impact of index-led investment strategies on market dynamics and efficiency;

The rest of this paper identifies and assesses these issues.

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<sup>20</sup> See Appendix 10.

<sup>21</sup> See Appendix 10.

## **C. Indices: their design and maintenance**

### **C1. Entities that construct and maintain indices**

Securities indices are generally constructed and maintained by stock exchanges, specialist index providers and brokerage firms<sup>22</sup>. Specialist index provider entities, such as Dow Jones, Standard & Poor's (S&P), Morgan Stanley Capital International ('MSCI') and FTSE International (FTSE), have come to play an increasingly dominant role in the marketplace, particularly in the development of regional and sectoral indices and customised indices for institutional clients. In some jurisdictions, exchanges also have arrangements with banks or external consultants, who may act as index ombudsmen or supervisors. Most index providers have established advisory committees composed of market and institutional representatives to assist with management functions associated with indices.

Market operators and market users rely on the accuracy, integrity and reliability of indices. The transparency of index provision has therefore increased in importance - as has competition among index providers.

#### **Assessment**

No SC2 member regulates index provision directly. Overall, SC2 members take the view that index providers are under strong commercial incentives both to deliver high quality products and to operate to high standards. While SC2 members see sufficient transparency of information relating to indices as important for market operators and market users, they consider that the various controls they already have through their powers in respect of contract design and exchange operations provide them with a range of tools for addressing problems that may arise in this context. A recurring feature through the remainder of this report is the desirability of good information flow and cooperation. In support of that, market operators should be encouraged to establish contact arrangements with index providers who design and maintain indices comprising securities that trade on their markets.

While SC2 members are not aware of generic or recurring problems with index provision per se, individual SC2 members have mentioned an issue of concern in respect of banks and other approved institutions customising indices as the basis for selling various related products to clients. While this practice is primarily an intermediary-client conflict of interest issue, regulators may also need to consider other issues, raised by index-related products that are not formally subject to any

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<sup>22</sup> In the present report, such entities are referred to as "index providers".

exchange or market operator approval process, especially their potential vulnerability to manipulation.<sup>23</sup>

## **C2. Index design and maintenance**

Fundamental to the utility of indices are the standards of index design and the ongoing management of an index. Index design – broadly, index composition and the calculation methodology – is central to indices’ value to users. Moreover, indices need not only to provide a useful, accurate and reliable way of measuring the performance of groups of securities over time, but also to fulfil that role in a way consistent with the orderliness of the market.

The key elements of the index management process are:

- index composition;
- index weighting and calculation methodology;
- index calculation and dissemination processes; and
- index adjustment/rebalancing processes.

This section identifies and assesses the principal issues that arise under each of the above.

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<sup>23</sup> The Comision Nacional del Mercado del Valores, Spain (CNMV) finds a potential conflict of interests when some financial products (such as certificates, warrants, etc.) are linked to a customized index calculated by the issuer of those products. The index may be a basket of securities or an index of funds. The first such case the CNMV faced was the following. An investment firm proposed issuing certificates linked to an index. This issue guaranteed 100% capital repayment, plus the gains of an index that would be created, maintained and calculated every three months by the issuer and its affiliates. This index was composed of two indices, one index on equity funds (with a weight of 75%) and another index on debt funds (with a weight of 25%). The equity funds index could be comprised of funds promoted and managed by entities belonging to the same group as the issuer. Additionally, the issuer could manage those funds discretionally and could, for example, earn income as a result of using those funds to carry out hedging activities. To address these conflict of interest concerns, after negotiations between the CNMV and the issuer, an independent entity was appointed to calculate and manage the index to which the certificates are linked. This independent entity is permitted to include funds managed by the issuer of the certificates in the index. Following the above case, the CNMV analyses each proposal for issuing financial products linked to a customized index. If it foresees a potential conflict of interest, it requires the issuer to appoint an independent entity to calculate that index. However, the CNMV allows an affiliate of the issuer to calculate the index if there are Chinese walls that guarantee the independency of the calculating entity.

### **a. Index composition**

The main determinant of index design is that the index must measure the performance of a representative group of securities in a way that is meaningful and useful. Indices that fail this test will quickly fall into disuse.

For most users, critical issues in index composition relate to some or all of the following:

- the (ongoing) representativeness of the index components in terms of the segment of the market (e.g. industry sector) the index sets out to measure;
- a dispersion of component stocks sufficient to prevent the index being unduly influenced by the performance of one or two component securities;
- the liquidity of component stocks (particularly important if the index user intends to replicate the full index in his portfolio); and
- the rules and protocols by which stocks are added to and deleted from indices.

### **Assessment**

Indices that underlie derivative products, or that are tracked by index funds, raise concerns about the potential for manipulation. To address these concerns, IOSCO set out key criteria for contract design of derivative products on stock indices. These are assessed more fully in section E.1.

### **b. Methodologies for calculating index levels**

The level of a stock market index reflects the current value of an index's component securities relative to a particular base period. Index providers use different methodologies to calculate index levels. The main types of indices, by type of methodology used, are as follows.

- capitalization-weighted indices, calculated by multiplying the share price of each component security by its number of shares outstanding, adding the products, and dividing by the current index divisor;<sup>24</sup>

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<sup>24</sup>The index divisor is the number originally selected to ensure that an index begins at an arbitrary initial value. Subsequently, an index provider adjusts the divisor when necessary to reflect events such as capitalization changes and additions or deletions of index components. Divisor adjustments generally are designed so that the level of an index will change only as a result of changes in the prices of the index's components during trading.

- modified capitalization-weighted indices, calculated in a manner similar to a capitalization-weighted index, except that the weighting in the index of any single index component is limited;
- price-weighted indices, calculated by adding the prices of the index's component stocks and dividing that number by the index divisor;
- equal dollar-weighted indices, in which each index component is initially represented by shares equating to an approximately equal dollar amount (e.g., \$10,000) and the index value is calculated by multiplying the number of a component company's shares in the index by the current share price and dividing the total by the index divisor.

Most stock market indices are capitalization-weighted. Some capitalization-weighted indices are free-float adjusted, so that only shares available for purchase in the public equity markets are used to calculate a company's weighting in the index. In these cases the index provider may exclude from a company's outstanding shares the stock held by governments, corporations, strategic partners, or other control groups. Methodologies used in many of the principal national and international indices are set out in Appendix 4.

### **Assessment**

In recent years, some index providers have begun making free-float adjustments to capitalization-weighted indices.<sup>25</sup> Free-float adjustments are designed to address concerns about price distortions that potentially could arise if a company is included in an index at a weight higher than its available free float. For example, if a stock with limited shares available for trading is included in an index at its full capitalization, fund managers tracking the index could drive up the prices of the available shares in their efforts to replicate the index.<sup>26</sup> By limiting the weighting of an index component to reflect only shares of that component that are available for trading, the free-float adjustment seeks to avoid this potential price distortion.

#### **c. Index calculation and dissemination processes**

Critical to the efficient operation of an index is the reliability of its prices, the procedures utilized when the prices of individual component securities are unavailable and the robustness of the processes for the collection of prices, their calculation and the subsequent dissemination of the index value.

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<sup>25</sup> The New York Stock Exchange moved its Composite Index to a free-float basis at the start of this year. There have also been announcements of plans to switch both the CAC 40 and MIB 30 indices to a free float basis.

<sup>26</sup> Similarly, if index funds were contracting, their sales of shares in such companies might have a disproportionate share price effect on the downside.

In general, the entity that develops and maintains the index determines the sources of the prices it uses in calculating index levels. Typically, the prices are sourced from the trading centre with the greatest liquidity and are the prices of the most recent trades. While securities exchanges are normally the ultimate source for the prices, index publishers often obtain prices through data vendors, such as Reuters or Bloomberg, particularly when an index comprises securities from more than one market.

Most of the principal benchmark indices are calculated throughout the trading day and disseminated continuously. In some jurisdictions, sector and other specialist indices<sup>27</sup> may be calculated less frequently or only once a day. If there is a suspension in the quotation of a component stock of an index that is calculated throughout the day, the index typically continues to be calculated using the last quotation before the suspension. If a stock's quotation is suspended before trading begins, the index normally is calculated using the closing price from the previous day. (In the unusual circumstances of a contemporaneous suspension of trading in a number of significant index components, index providers may continue to calculate and publish an index, with appropriate warnings, but some markets may suspend trading of derivatives based on that index.<sup>28</sup>)

Dissemination of indices normally takes place through a stock exchange's electronic information systems and/or through various third-party information vendors on a real-time or delayed basis during the market's trading hours.

Indices published throughout the day usually start publishing as soon as a price for the current day is available for at least one of the companies contained in the index. In the case of indices whose components are traded on markets with different trading hours, such as Dow Jones Stoxx indices, the index dissemination period begins when the first major trading system in the region covered by the index opens for trading. For the Dow Jones Stoxx indices, the actual dissemination of each index is triggered when the first opening stock price for that index is received, and the index dissemination period ends when the last major trading system closes.

### **Assessment**

Central to the value of indices is the reliability and timeliness of the prices used for component securities – whether intra-day or closing prices, or whether drawn from domestic or foreign markets. It is important for market users to know not only of any normal time lags in the incorporation of prices in an index – most likely to occur in respect of foreign securities – but also, as soon as possible, when

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<sup>27</sup> For example, in Germany performance indices (where all income from dividend and bonus payment is additionally reinvested in the index portfolio) are mainly calculated throughout the trading day, whereas price indices (which measure the actual price development and are only adjusted for income from subscription rights and special payments) are calculated once a day at the close of business..

<sup>28</sup> See Report on Trading Halts and Market Closures (IOSCO, 2002)

index calculation is being affected by such factors as trading suspensions in index components or problems with price feeds from any particular market.

The reliability and timeliness of index dissemination itself has also become increasingly important as more market activity becomes responsive to the real-time movement in indices. While problems in index calculation and dissemination do occur, they appear to be rare.<sup>29</sup> In any event, market operators should have in place agreed and transparent processes for resolving any issues arising in such situations.

It is also important for both suppliers and purchasers of index feeds to know with certainty that delivery systems provide the capacity for index data to be delivered in a timely way and contemporaneously with the current price feeds for the underlying securities. While this is not necessarily an exchange responsibility, material discrepancies may impair the efficiency of trading and expose user firms to risk.

### **C.3 Index rebalancing**

The usefulness of an index is linked to its ability to reflect market trends accurately. Accordingly, index providers must revise or “rebalance” their indices periodically to ensure that they continue to reflect the markets they are designed to track. An index provider may review an index on a quarterly, semi-annual or annual basis. Changes that may result from a scheduled review of the composition of the index include the following:

- a variation in a component stock’s weighting in the index due to a change in capitalization or free float;
- the addition or deletion of an index component due to a change in a company’s market capitalization;
- the addition or deletion of an index component following a company’s entry or exit from a market segment;
- the deletion of an index component for failure to meet requirements specified for inclusion in the index, such as liquidity;
- re-weightings reflecting changes in the structure or significance of the sector being measured
- changes to the index divisor.

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<sup>29</sup> See case study on miscalculation of ASX index in Appendix 6.



In addition to periodic revisions, index providers normally revise an index's composition between scheduled dates in response to exceptional events (e.g., bankruptcy, mergers, takeovers, public offerings and other corporate actions). These extraordinary revisions are generally implemented on an 'as needed' basis, in compliance with the rules/conditions governing the index.

Revision of an index calculation methodology, such as the adoption of new stock weighting criteria or inclusion/exclusion rules, may also lead to extraordinary rebalancing. Changes in the methodology, however, are relatively infrequent and represent structural actions aimed at improving index coverage and effectiveness. The most significant methodological change in index structure in recent years has probably been the implementation of a 'free float' adjustment for some capitalization-weighted indices (as described in section C.2).

The criteria and procedures for index rebalancing are set in the index provider's rules and protocols. These may provide essentially fixed and predetermined processes for rebalancing (e.g. the ranking of shares solely by publicly available data, such as market capitalization and liquidity), or they may delegate to the index manager varying levels of discretion in certain areas (e.g. to ensure an adequate range of industrial sectors).

From a market perspective, index rebalancing leads not only to securities moving in or out of an index but also to consequential re-weightings of ongoing index constituents.<sup>30</sup> The issues of particular importance to market regulators in relation to the rebalancing process concern:

- the price sensitivity of rebalancing information; and
- trading activity around the time of the rebalancing in securities entering or exiting the index.

Price sensitivity arises because the identification of stocks to be added to or removed from an index often results in price volatility and high turnover in those stocks around the time of rebalancing. Information that securities are to be added to or removed from an index is therefore generally viewed as price sensitive.<sup>31</sup>

The impact on trading activity at the time of rebalancing results from the trading of added/deleted stocks by managers of funds tracking the index and from trading by speculators and other market participants who take positions in stocks that are likely to be added to or deleted from an index. Funds tracking an index attempt to

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<sup>30</sup>A different form of rebalancing is the portfolio rebalancing undertaken by a fund manager who decides to change the index it tracks. This too can potentially have a material short-term effect on trading in the securities involved.

<sup>31</sup>For instance, the UK Code of Market Conduct cites changes to the constituents of a securities index as an example of 'announceable information' that a regular market user would reasonably expect to be disclosed. Improper use of such information ahead of its public announcement might potentially constitute an offence.

purchase a stock being added to an index at a price as close as possible to the stock's index entry value, thereby minimizing their tracking error. In doing so, these funds may be concerned primarily with minimising tracking error rather than with any potential short term price impact resulting from their trading.<sup>32</sup>

### **Assessment**

While member jurisdictions have no laws or regulations specifically addressing index rebalancing criteria and methods, which are usually established by the entity that develops and maintains the index, index rebalancing raises issues relating both to proper disclosure and market orderliness.

Survey responses by SC2 and Consultative Committee members ('the survey responses') to the question of whether there had been any observed price impact from rebalancing indicate that any market effects are short-term (See Appendix 5, answers to question 30). Comments from exchange members of the Consultative Committee indicate that in their opinion this is the result of the close monitoring of market activity and the coordination measures put in place between exchanges in anticipation of index rebalancing (and contract expiry) dates.

Additionally, while the short term effects of index rebalancing are generally to increase trading levels and to raise (reduce) the price of the added (deleted) stocks, especially in the day after the announcement and in the day before the effective change, much academic literature suggests that index rebalancing does not have a long-term effect on security prices. The literature is reviewed in more depth in section D.

In the view of the Technical Committee, the most important issues that regulators need to take into account when looking at rebalancing are the following:

***Transparency.*** Given the potential short-term impact on the share price and trading volume of a stock added to or deleted from an index, it is important that information on the rebalancing rules and methodologies adopted by index providers, as well as details on proposed index revisions, are available on as wide and timely a basis as possible. Regulators can more readily ensure that high standards are adhered to in respect of exchanges that themselves sponsor the indices being changed. Where an exchange trades an index derivative or index-related product, regulatory tools may include the requirements placed on index provision in contract design criteria for index derivative contracts (equity index futures and options) or listing requirements for other products.

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<sup>32</sup>For instance, hedge funds, arbitrageurs, and proprietary traders may take positions in or against securities that are expected to enter or exit the index just before the revision announcement. Further, institutional clients may give instructions to dealers to rebalance their portfolios, thereby shifting to them any tracking error risk. On the rebalancing date, dealers can reduce the risk taken and make profits by taking/reducing positions throughout the day, but will likely still be active up to the time the reference price is set. In doing so, they may influence prices.

Market operators (or regulators) should also consider whether there is general, or more specific, information relating to rebalancing (relating, for example, to any particular expectation of increased short-term volatility) that it would be useful to put in the public domain. Such information might flow from enhanced surveillance undertaken around the time of rebalancing, as described below under ‘monitoring’.

***Determination of a component’s index entry value.*** When a stock is added to an index, the index provider must decide what price point (e.g. closing price) to use when recalculating the index’s divisor to reflect the new component. This is the price at which funds tracking the index will try to purchase the stock. Like the prices used to calculate index levels throughout the day, the prices used in these calculations must be reliable and verifiable. Accordingly, regulators and market authorities may wish to require (e.g., through listing standards) an index provider to specify the source of the prices it uses in making index calculations.

***Monitoring.*** A potential problem with the additional trading activity to be expected in securities affected by index rebalancing is the difficulty in forecasting individuals’ rebalancing strategies and foreseeing the possible impact of those strategies on prices and volumes. The case studies in Appendix 6 may be of value to regulators in underlining the importance of enhanced monitoring during rebalancing periods and the potential usefulness of pre-event intelligence gathering and analysis, as well as increasing the level of information available to the public on the rebalancing and its potential effects on prices and volumes.

Additionally, regulators may wish to consider monitoring the nature and timing of corporate announcements ahead of decisions on index changes. Issuers facing exclusion from an index, or potential candidates for inclusion, may feel under additional pressure to present their prospects in the most favourable possible light.

***Co-ordination.*** The effectiveness of the measures identified to address the issues set out above is likely to be assisted by co-ordination among index providers, market authorities and regulators. In this respect, co-ordination could be more easily effected if market authorities have identified a contact person nominated by the index provider. Co-ordination issues are considered in more detail in section E.4.

## **D. Market issues arising from the increased use of investment strategies and products based on indices**

The substantial growth in recent years in the use of indices, index-based investment policies and products based on indices has raised a number of market and public policy issues.

Many of these issues fall beyond the remit of market regulators. For instance, at the macro-economic level a question has been raised about the potential impact of index structuring on capital allocation, both between companies and between

countries. At the investor level, there has been some focus on issues such as the design and marketing of secondary products based around indices.<sup>33</sup>

Of more relevance to market regulators is any impact the greater use of index-tracking may have on the orderliness or pricing efficiency of equity markets. This concern is in addition to any issues arising specifically from index rebalancing or the arrangements for establishing an index derivative settlement price.

Generally, those with concerns about the impact of indexation on market quality recognise that index tracking is an entirely logical investment strategy for many investors seeking equity exposure. They may also acknowledge that index trackers may add liquidity to markets. But they contend that index-tracking can drive prices away from fair value. This is because index-trackers trade in equities (whether buying or selling) strictly on the basis of replicating index weighting and with no consideration of the fundamental value of individual index components. Some argue that this effect may be further exaggerated in two particular ways. First, many other investors who are not formal index trackers nonetheless tend to focus their dealing on the more heavily weighted index components so as to better manage their performance relative to key indices. Secondly, issuers of securities included in commonly-tracked indices may in some circumstances be able to price new issues of shares higher than would otherwise be the case by virtue of knowing that index trackers will need to buy them to maintain their weightings. Some commentators see these factors as having been at least contributory factors to the TMT bubble.<sup>34 35</sup>

### **Economic studies**

Much of the economic literature in this area shows that indexing has positive effects, in terms of lowering transaction costs and increasing the liquidity of stocks in the index. Moreover, there is no significant academic evidence of any lasting price impact from the use of indexing strategies by portfolio managers - a finding confirmed by the responses to the SC2 surveys. Below is a brief summary of this literature. The topic continues to be studied widely by academics.<sup>36</sup>

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<sup>33</sup> In a number of countries there are packaged retail investment products with returns based on the performance of one or more indices.

<sup>34</sup> See, 'The Passive Trap' by Paul Woolley and 'The Economic implications of passive investing', by Paul Woolley and Ron Bird. These papers argue that the growth of indexing and index-hugging strategies has begun to upset the balance of competitive forces among equity market participants, making share prices likely to be a less good estimates of fair value and increasing market volatility. The authors also cite the case of Vodaphone Group plc as an example of an issuer assisted in the massive acquisition of overseas assets – quadrupling its index weighting in a matter of months – in the knowledge that both pure index-trackers and many active manages would need/want to buy new shares to maintain their weightings or hold their tracking error within reasonable bounds.

<sup>35</sup> TMT = Telecoms, media and technology, often considered the main sectors driving the rising market through the 1990s.

<sup>36</sup> Appendix 9 provides the full references for the academic literature.

*Academic Literature.* Gastineau (2002) provides a general, detailed overview of the history of indexing. He describes some of the technical problems encountered in constructing and maintaining indexes. Harris (2002, Chapter 23, and references contained therein) discusses the beneficial effects of indexing, including lower transactions costs and increased liquidity for stocks entering the index. Hegde and McDermott (2002) provide empirical support for these conclusions. They considered the increased liquidity that arises when a stock is added to an index, which might be explained by a number of hypotheses: the attention hypothesis, in which inclusion in an index leads to more following by analysts and investors; the information hypothesis, in which inclusion in an index conveys information to the market about a company; and the liquidity hypothesis, in which an increase in the frequency of trading leads to lower trading costs. In fact, Hegde & McDermott's results showed that stocks added to the S&P 500 index enjoyed lower spreads, increased depth and increased trading volume after they entered the index, and that these beneficial effects are permanent. Edmister, Graham and Pirie (1996) and Erwin and Miller (1998) had earlier reached similar conclusions. They corrected for pre-announcement effects and concluded that the abnormal returns might be due to increased attention, but that they definitely were not due to indexing.

As for possible adverse effects of indexing, the academic literature that analyses price effects considers two possible types of index changes: irregular changes and periodic changes. For example, a selection committee makes the S&P 500 changes at irregular intervals throughout the year. In contrast, the Russell and MSCI index changes are made at periodic intervals. The literature considers the pricing effects of each approach.

In an early study, Harris and Gurel (1986) considered indexing in the context of three hypotheses of pricing behaviour: the efficient market hypothesis, in which securities are assumed to be nearly perfect substitutes so that large blocks of stock may be traded with little price effect; the imperfect substitutes hypothesis, in which rebalancing indexes would have permanent price effects; and the price pressure hypothesis, which asserts that demand shifts during rebalancing would lead to short-term price changes to compensate investors who supply immediately securities that they would not otherwise trade. They concluded that stocks that were added to the S&P 500 index increased in price immediately by more than 3 percent, but that the effect was reversed after about 2 weeks, which is consistent with their price pressure hypothesis.

Numerous other authors have since found similar short-term price impacts (Beneish and Whaley, 1996; Chen, Cuny & Haugen, 1995; Dash, 2002; Dhillon and Johnson, 1991; Goetzmann and Garry, 1986; Graham and Pirie, 1994; Jain, 1987; Lynch and Mendenhall, 1997; Madhavan and Ming, 2002; and Shleifer, 1986). In contrast, Bos (2000) found a price effect lasting a year.

A paper by Malkiel and Radisich (2001) acknowledged that excess returns gained from stocks entering the S&P 500 could, if sustained, "create a pricing 'bubble' that may eventually burst", but the authors found that one month after index

changes there was no measurable effect on prices of stocks that were added or dropped from the S&P 500 index. They also concluded that the dramatic rise of stock prices in the 1990s could not be explained by the “indexing craze.” Morck and Yang (2002) also assert that an “indexing bubble” might undermine the efficiency of the stock market, and they conclude that bubbles might be prevented if indexers stopped “all investing in the same 500 stocks,” which would help prevent firms in the index from becoming overvalued and thus preventing the “economically inefficient over-investment by index member firms.” Nevertheless, Morck and Yang provide no evidence that any of their conjectured over-investment has occurred. So, 16 years after the Harris and Gurel study there is still no evidence that changes to the S&P 500 index have any lasting price impact on the market.

Similarly, academic studies have shown that indices with well-defined periodic change dates, such as the Russell and MSCI indices, do not have a significant market impact, despite users of indexing strategies being aware in advance of the dates and criteria for index changes. Recently, Madhavan (2001) and Jankovskis (2002) studied changes in the Russell 3000 index and concluded that stocks that were added or deleted from the index had only transitory price changes. In contrast to the irregularly spaced changes that Standard & Poor’s makes to their index, the Russell index changes once a year at the end of June, based on market capitalizations at the end of May. Because portfolio managers all know the end-of-May capitalizations, they may accurately predict which stocks will be added to the indexes. Madhavan showed that index funds that waited until the reconstitution date paid a steep price for waiting. But these price effects were only temporary, so neither irregularly changed indexes nor periodically changed indexes have a lasting impact on markets.

Finally, mention should be made of an interesting paper by Barontini and Rigamonti (2000) that describes the situation in the Italian stock market. They note that following the creation of the Mib 30, an index of the top 30 stocks by capitalization and liquidity, stocks that were added to the index at both regularly scheduled and special revision periods had short-term positive abnormal returns. But when the Midex was created, which included only the next 25 stocks, additions to the Mib30 had negative abnormal returns. They also show that the creation of an index does not affect stock liquidity until trading starts in derivatives based on that index.

***Industry Practices.*** Notwithstanding the results of the academic papers, an examination of specific industry practices in indexing might cast light on potential problems caused by those strategies. But the industry practices tend toward stabilizing, not destabilizing the markets. Following are the key findings:

Many of the potential risks of indexing strategies are mitigated because indexers face a trade-off between *tracking error* and *transactions costs* (see Harris, 2002, pp. 486ff). For example, trying to replicate the results of the S&P 500 by buying every stock would minimize tracking error, but the transaction costs would be enormous. Because of the tracking error versus transactions cost tradeoffs,

indexers are really self-regulating in the sense that they will vary their timing and portfolio compositions in an attempt to minimize both costs and tracking error in a highly competitive environment.

Madhavan (2001) described an extreme case in which all indexers knew in advance what the date of changes would be and what would be the most likely candidates for deletion from and inclusion in the index. Indexers who waited until the last minute before the reconstitution date paid a steep price for waiting because of the price changes that occurred while they waited. But even that case involved other risks. For example, there may be weighting changes due to changing market capitalizations and short-term price impacts of rebalancing that adversely affect a portfolio. As a result, over time the changes in trading patterns by indexers with different degrees of risk-taking will help alleviate any sudden market disruptions from changes in indices.

### **Assessment**

While the review of both the academic literature and industry practices leads to the clear conclusion that the movement of securities into and out of indices does not pose a systemic risk to financial markets, the extent to which index-tracking may be having an impact on market dynamics or any detrimental effect on the quality of markets is difficult to assess. If it is argued that a high level of index-tracking tends to drive individual securities away from fair value, it can also be argued that the natural response of other investors should be to capitalise on any apparent mis-pricing. Once again, the degree to which this has (or has not) been taking place is not easy to assess. Those who support efficient market theory may dispute the potential for index-tracking per se to create (lasting) pricing distortions. It could also be argued that if index-tracking tends to create some valuation anomalies, it may correct others. There is currently a paucity of academic literature on this subject. Further analysis of market performance through the recent bull and bear cycle may in due course lead to more light being shed on whether index-tracking influenced market dynamics during the cycle, and this may help to determine whether there are issues that call for additional regulatory attention.

In the meantime, market pressure has resulted in some change, including the recent trend towards greater use of free-float adjusted indices. As previously described, by adjusting the weightings of an index's component stocks to account for the amount of a company's stock estimated to be readily available for investment, index providers have aimed to reduce the influence of index stocks where significant amounts of the issue are not available to portfolio investors because they form long-term holdings by governments, or strategic holdings by corporations, founding family investors or other entities.

Sections E.2 and E.3 of this paper address more specific issues for the cash markets arising from the growth in the derivatives markets, in particular the

behaviour of cash markets at the time of index future expiries and the interaction between cash and derivative markets during periods of market stress.

## **E. Index derivatives**

Stock index derivatives products consist primarily of futures and options contracts. Responses to the Standing Committee's survey confirm that stock index derivative products are traded in many jurisdictions. These products are generally traded on-exchange, and issued by the exchange or its approved clearinghouse. In some countries there is also substantial OTC business in index derivatives.<sup>37</sup>

The arrangements for on-exchange trading vary from one jurisdiction to another. In some jurisdictions, the derivative contracts trade on the same exchange as the underlying index component securities. In others, index derivative products and the index's component securities trade on different exchanges.

Index derivatives raise three principal issues in the context of the fair and orderly operation of markets. These relate to:

- contract design that minimises the scope for manipulation and facilitates the orderly convergence of derivative and cash market prices at the time of contract expiry;
- adequate controls for ensuring orderliness in and between derivative and cash markets in conditions of market stress; and
- proper arrangements for the effective co-ordination of oversight between the index derivatives market and the underlying cash market(s).

*The 1992 Report* addressed these issues in the context of market development at that time.<sup>38</sup>The rest of this section revisits those papers in the light of subsequent market developments.

### **E.1 Contract design and listing standards**

The *Contract Design Paper* addresses the key issues regulators and market operators should take into account by stating that they 'need to examine the appropriateness of product design to ensure that such design does not impair orderly pricing in either the cash or derivative market and is appropriate to avoid

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<sup>37</sup> As mentioned in section B, several countries have trading in securitised derivative products based on equity indices, such as covered warrants.

<sup>38</sup> See <http://www.iosco.org/iosco.html>.



the risk of disruption, including manipulation, in those markets.’<sup>39</sup> It then specifies the points that should be addressed in constructing or reviewing an index. These are set out in the table below, which also includes (in the right hand column) some observations on application drawn from the survey of SC2 members.

Points to be taken into account	Responses provided by SC2 members
<p><b>i. The method of calculation: Whether the index is calculated in an appropriate way including the weight given to component stocks so that the price movements of a few particular components do not exert undue influence on the movement of the index. In addition, the index calculation</b></p>	<p><b>In most if not all jurisdictions surveyed, the index calculation formula for indices underlying derivatives products is publicly available. Few jurisdictions provide mandatory limits on the weighting of the component securities in an index, although index providers may provide such limitations for some indices.</b></p>

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<sup>39</sup> In the *Application of the Tokyo Communiqué to Exchange-Traded Financial Derivatives Contracts* (1998)(see “applicability of the design guidance”), the Technical Committee has further articulated the rationale for proper design of derivative contracts as follows:

‘As stated in the Application of the Tokyo Communiqué, contract design standards should be viewed as a complement to an appropriate surveillance system. In general, contract design standards are intended to assure that contracts are not readily susceptible to manipulation, that the delivery and/or settlement mechanism is reliable, and that the prices of the underlying and the derivative converge at expiration and, as a consequence, such standards also should maximize the economic utility and commercial appeal of such contracts by assuring that they can serve potential users’ needs to manage price or other risks.

‘Initial responsibility for contract design generally rests with the exchange proposing to offer the contract. Contract design procedures should take account of whether either the cash or derivatives side of the market can be distorted or can impair the pricing relationship. Contract design standards should be viewed as a complement to an appropriate surveillance system [because] appropriate contract design will enhance the ability to supervise a market in any type of derivative product, and market surveillance measures can be targeted to address those aspects of a contract that may potentially render it vulnerable to abusive practices.’

<p><b>formula should be made available to the public.</b></p>	
<p><b>ii The number of component stocks: Whether the index is composed of a sufficient number of stocks of non-affiliated issuers so that the price movements of a few particular component stocks do not exert undue influence on the movement of the index.</b></p>	<p><b>Most responding jurisdictions have no requirements establishing a mandatory minimum number of index components or specific requirements regarding the number of stocks of non-affiliated issuers that could be included in an index.</b></p>
<p><b>iii. The liquidity of component stocks: While there may be great differences in the liquidity of component stocks, whether each component stock has sufficient liquidity so that the trading of such stock does not exert undue influence on the movement of the index.</b></p>	<p><b>In nearly all jurisdictions, markets or regulators consider both the capitalization and liquidity of an index's component securities in reviewing derivative products based on indices. In addition, index providers generally consider the capitalization and liquidity of components in developing indices (as well as the market on which they are traded and the information publicly available about the issuer.)</b></p>
<p><b>iv. The dispersion of</b></p>	<p><b>At least six jurisdictions</b></p>

<p><b>component stocks within a business sector or across sectors: Whether the component stocks are broadly based so that the price movement of stocks belonging to a certain business sector does not exert undue influence on the movement of the index.</b></p>	<p><b>trade derivatives products on narrow-based indices as well as broad-based indices. (The dispersion of component stocks is discussed more fully below.)</b></p>
<p><b>v. The replacement of component stocks: Whether there is a non-arbitrary and well-publicized procedure for reconsideration of the appropriateness of continuing to include index component stocks, either on a regular basis or as occasion demands.</b></p>	<p><b>Most index providers publicize their procedures for reviewing their indices.</b></p>
<p><b>vi. The selection of component stocks: In order to prevent the index from being unduly influenced by price movements</b></p>	<p><b>The responding jurisdictions indicate that the factors considered in reviewing an index's component securities include: (i) the trading volume and capitalization of</b></p>

<p><b>of particular component stocks, whether such stocks are selected in full consideration of items (i) through (iv) above.</b></p>	<p><b>the index’s component securities; (ii) the weighting of the component securities in the index; (iii) the availability of information concerning the securities; and (iv) whether the securities are listed securities and the market on which they are listed.</b></p>
<p><b>vii. Clearance and settlement: Whether the procedures for clearance and settlement are prudentially designed and interact effectively with the cash market.</b></p>	<p><b>Most jurisdictions have adopted clearance and settlement provisions with the goal of minimizing market disruption. As a result, most derivatives contracts are settled either at the opening-price on the settlement day or at a price calculated as the average of all-the-day quotations or of the prices during a limited period of the trading session.</b></p>

All regulators attach high importance to the design quality of index derivative contracts. In the majority of SC2 jurisdictions, contract design, as well as related trading rules, are subject to regulatory examination and the regulator’s prior approval before the contract is listed. In several jurisdictions, exchanges have adopted listing standards or guidelines for stock index derivative contracts that are subject to regulatory review and approval. Even if they do not have statutory stock index derivatives listing standards, most jurisdictions require new products to meet specific criteria and may require amendments to any proposals to list new derivative products if they consider them necessary for market transparency, the orderly conduct of trading or investor protection.

**Assessment**

While the recommendations of the *Contract Design Paper* appear to remain fully appropriate, the Technical Committee also notes that since that report was

prepared there has been increased market interest in a wider range of indices, including sector indices, indices focused on a smaller number of component securities and international indices comprising a range of securities from different countries.

Although none of these developments has so far led to a significant range of widely used derivative products based on these type of indices, it is evident that there may be greater interest in developing such products in the future.

#### *a. Non-diversified indices*

The 1992 *Contract Design Paper* made clear that although the design criteria “should be taken into account in the design of all indices, the application of any particular point may vary depending on whether the index is broad- or narrow-based.”<sup>40</sup>

So while the 1992 criteria concerning the number and dispersion of component stocks remain relevant for diversified indices covering a number of business sectors, they may be less relevant to less diversified indices, such as indices comprising a small number of securities or representing a relatively narrow industry group or sector. Moreover, where the objective of the index is to measure the value of a narrow or tightly focussed market segment, the weighting of one or more individual securities may represent a comparatively larger percentage of the index’s capitalization (particularly in a smaller industry segment) than would exist in a more diversified, broad-based index. At the extreme, the index could effectively become a surrogate for a single stock.

The inapplicability of ‘the number of securities’ or ‘dispersion’ criteria to non-diversified indices need not present an obstacle to the objective of minimizing the opportunity for manipulation and preventing other violations of securities laws, such as insider trading laws. As the Technical Committee previously noted in its consideration of the application of the *Tokyo Communiqué* to exchange-traded financial derivative products, ‘contract design standards should be viewed as a complement to an appropriate surveillance system.’<sup>41</sup> That is, one can view the interplay of design standards and surveillance along a continuum such that more aggressive surveillance can be applied to supplement the design characteristics inherent in non-diversified indices for which number or dispersion of component stocks standards cannot be imposed without defeating the very purpose of the non-diversified index product.<sup>42</sup>

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<sup>40</sup> 1992 Contract Design Paper,, p. 3.

<sup>41</sup> Application of the Tokyo Communiqué to Exchange-Traded Financial Derivatives Contracts (1998).

<sup>42</sup> As previously explained by the Technical Committee:

In the case of equity-based index products, different contract designs may require more aggressive surveillance and added protections with respect to abusive trading or misuse of information, especially to the extent that the market acts like a market in a single security. Special intermarket surveillance and cooperation arrangements also will be required if the index’s reference is a thinly-

The Technical Committee re-emphasizes that in considering the 1992 design criteria, it intended that the criteria be applied flexibly and that the application of any particular point may vary depending on whether the index is broad-based or non-diversified.

Accordingly, in considering these more focused, non-diversified indices, regulators may need to consider all the characteristics of the index design to reach a judgement on whether trading a derivative based on the index presents risks in respect of potential manipulation or disorderly markets. For instance, a contract based on a broad, diversified index comprising a small number of highly liquid blue chip securities may carry much less risk of manipulation than one comprising a larger number of diversified but less liquid securities.

In any event, when considering the overall characteristics of a derivatives contract on an equity index, regulators and market operators also need to consider the extent to which particular characteristics of index design raise concerns that may require special surveillance measures. Their judgement of the suitability of the contract will therefore need to consider the capability and quality of the surveillance systems of the market operator listing the contract.

In light of the development of derivatives on non-diversified indices for which the existing number and component stocks criteria are inappropriate, the following additional point should be considered:

‘Whether appropriate and effective arrangements are in place to maintain orderly markets and prevent manipulation of the markets for the index product and component securities. For non-diversified indices, whether more aggressive surveillance and added protections with respect to prevention of abusive trading or misuse of information may be required.’

***b. Indices comprised of foreign as well as domestic securities***

A particular feature of recent years has been the growth in the number of international indices. Some represent securities from a number of markets in different countries (eg. European blue chips); others are designed to provide investors with a tool against which to measure performance or track industry sectors on a regional or global basis. To date, there are few derivative contracts based on these indices, but they may well grow in the coming years.

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traded cash market as there may be potential for price distortions or manipulation of the price of the instrument underlying the derivative. Where surveillance regimes must operate across or between one or more markets under separate governance and possibly supervision, market authorities may find that potential inter exchange competitive issues should be considered in designing surveillance programs. Intermarket cooperation on surveillance issues will be enhanced where programs are developed between authorities responsible for the markets in advance of problem events. *Application of the Tokyo Communiqué to Exchange-Traded Financial Derivatives Contracts* (1998),

The *Contract Design Paper* recognised the likely evolution of more derivative contracts based on indices comprising securities from foreign countries but made no specific additional recommendations in terms of contract design. Instead, it placed the emphasis on international co-operation of regulatory authorities and related cash and derivative markets by means of information exchange and discussion in order not to impair orderly pricing in either market and to avoid the risk of disruption, including manipulation, in both markets. These issues are discussed more fully in subsequent parts of this section.

## **E.2 Clearance and Settlement<sup>43</sup>**

One of the most important elements in any index derivative contract is the arrangement for the final settlement of the contract, and in particular the basis for determining the settlement price. Settlement arrangements, whether by cash settlement or physical delivery, are intended to ensure that the price of a derivative and its underlying asset converge at expiry in a way that accurately reflects (and does not distort) the underlying cash market. This enables the derivative to provide an efficient risk management function. When there are impediments to making or taking delivery, or when cash settlement procedures do not accurately reflect the underlying cash market, there is increased risk of non-convergence and of price disorder or manipulation.

Exchanges that sponsor index derivative contracts generally use one of two approaches to establish the contract expiry price. In one, the expiry price is based on an index value that results from an auction process; in the other, it is based on an index value that results from averaging index readings over a predetermined period of time. Auctions may be held at the opening of business, intra-day or at the close. Averaging (which is sometimes volume-weighted) is normally achieved by taking index readings over a relatively short period – 20 or 30 minutes, for example – or over the whole of the final trading day. The table below sets out the practices adopted by exchanges covered by questionnaire responses from SC2 jurisdictions and (responding) Consultative Committee members.

**Methods of establishing futures expiry price**

<b>Country</b>	<b>Methodology</b>
<b>Australia (SPI 200)</b>	<b>Index calculated using first traded price of each component on last</b>

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<sup>43</sup> This discussion addresses settlement procedures at expiration of the contract, at which time the contractual obligations under the derivatives contract are discharged either through physical delivery or cash transfers.

	<b>trading day (or last traded price if stock does not open).</b>
<b>Belgium (BEL 20)</b>	<b>Average of index, measured at 5 min (?) intervals, between 2.30 and 3.00pm on last trading day.</b>
<b>Canada (S&amp;P/ TSX 60)</b>	<b>Opening price of index on day after last trading day.</b>
<b>France (CAC 40)</b>	<b>Average of index, measured at 30 sec intervals, between 3.40 and 4.00pm on final trading day.</b>
<b>Germany (DAX 30)</b>	<p><b>Index value based on intra-day auction prices on final trading day. The normal 2 minute intra-day auction at 1pm is extended to 5 minutes for settling the index expiry price. Volatility halts apply, so the auction can be extended in some securities but rarely last more than 10 minutes overall.</b></p> <p><b>The expiry price for the STOXX future is settled on the basis of the average index reading (41 in total) between 12.00 and 12.10.</b></p>
<b>Hong Kong (HSI and MSCI indices)</b>	<b>Average of index quotes taken at 5 minute interval over final trading day (subject to override by HKFE).</b>
<b>India (S&amp;P Nifty)</b>	<b>Derived from average prices of each index component over final 30 minutes of trading.</b>
<b>Italy</b>	<b>Index level based on opening auction prices on final trading day.</b>



<b>Japan (Nikkei 225/300)</b>	<b>Opening price of component securities on day following final trading day.</b>
<b>Netherlands (AEX 24)</b>	<b>Average of index, measured at 1 minute intervals, between 3.30 and 4.00pm on final trading day.</b>
<b>Singapore (Straits Times + MSCI)</b>	<b>Average of index measured at 60 second intervals over final hour of trading, excluding highest and lowest readings.</b>
<b>Spain (Ibex 35)</b>	<b>Average of index measured at 60 second intervals between 16.15 and 16.45 on final trading day.</b>
<b>S&amp;P Europe</b>	<b>Opening price of each index component on expiration day</b>
<b>Sweden (OMX Index)</b>	<b>Trade weighted average of index based on all readings over final trading day.</b>
<b>Switzerland (SMI)</b>	<b>Based on index value arising from opening auction on the final trading day.</b>
<b>Taiwan</b>	<b>Closing index on final trading day</b>
<b>US (S&amp;P 500)</b>	<b>Based on first traded prices on day after the final day of trading in the future. Prices collected by S&amp;P from NYSE (most of the constituent stocks) + AMEX and NASDAQ.</b>
<b>UK (FTSE 100)</b>	<b>Based on the average of the 81 index readings between 10.10 and 10.30 a.m. on the final day of trading, adjusted to exclude the 12 highest and lowest readings.</b>

## **Assessment**

Although the *Contract Design Paper* specifies clearance and settlement arrangements as a factor to be taken into account by regulatory authorities and exchanges in considering contract design, the Technical Committee considers it important to stress the common goal of such settlement procedures – ensuring that the arrangements for arriving at the expiry price are designed to minimise the potential for manipulation or distortion and in the case of a cash-settled contract that the price is based on reliable and publicly available cash market prices.<sup>44</sup>

Accordingly, the clearance and settlement criteria should be revised to take into account whether settlement of the contract is at a price reflecting the underlying cash market, minimises the potential for manipulation or distortion, and is based on a reliable and publicly available cash price.

The Technical Committee does not, however, consider that developments since 1992 make it desirable to mandate any particular trading methodology or processes for arriving at an index expiry price. It recognises that the choice of methodology for determining the settlement index price at expiry involves a trade-off between liquidity and the mitigation of manipulation risk and that structural differences among markets may lead exchanges and regulators to approve a variety of settlement methods. Factors that may be pertinent for exchanges and regulatory authorities to bear in mind when reviewing the arrangements for arriving at index expiry prices include the typical size of positions to be unwound at expiry relative to normal trading, the nature of the cash market's trading functionality (e.g. whether or not it has well-tried auction functionality), any potential impact of the chosen method on trading and liquidity patterns in the days ahead of the expiry, and whether or not the unwinding process is discrete or likely to affect other market users or prove disruptive to other market activity.

Regulators and market operators may therefore need to keep the processes under review and improve them in the light of experience and changes in the types of contract being used or changes in trading patterns or trading systems. Appendix 6 contains case studies that illustrate some of these considerations and how it may be desirable to modify processes. In any event, the Technical Committee encourages markets listing index derivative products and those trading the component securities underlying the index to co-operate in evolving, as necessary, microstructure measures that support sound clearing and settlement processes.

### **E.3 Index derivatives and the cash markets : adequate controls for ensuring orderliness in and between derivative and cash markets in conditions of market stress**

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<sup>44</sup> Because equity index derivative contracts are predominantly cash-settled (and thus not restrained by physical supply), the potential for squeezes is much reduced. Settlement and expiry prices may, however, remain vulnerable to the manipulation of the prices of underlying component securities.

The *Market Disruption Paper* took as its premise that the 1987 market break demonstrated that the cash and derivative markets should be considered as “one market” economically, and focused attention on the role for coordination and supervision of the cash and derivative markets. The paper concentrated on the development of measures to minimize market disruption<sup>45</sup> such as circuit breakers, shock absorbers and price limits.

Discussion in the paper was essentially descriptive. For example, the paper reviewed the then-current status of circuit breakers, which at the time had been implemented only in the United States, France, Switzerland and Canada. Because of the limited experience, the report concluded, “it is difficult to determine whether circuit breakers are either effective or beneficial to the market.” The paper described the so-called “shock absorbers” or “speed bumps” that had been recently adopted at US securities and futures exchanges, but did not have any data on the implementation of those new mechanisms. Finally, the paper described the existence of price limits in Japan, France, Germany and Italy, and the ‘fast market’ rule in the United Kingdom.

### **Assessment**

Since 1992, the academic and market debate on the inter-relationship between cash and derivative markets has tended to move away from the view that either the interaction between the two markets or the ‘disconnection’ between the two markets *per se* increases the potential for systemic instability. Specifically, in relation to the trading of indexed derivative products, economic literature suggests that systemic volatility did not increase through the period 1992-1997, that the introduction of equity-based index futures contracts provides liquidity and market depth for the equity market, and that any adverse impact of equity index futures trading on market volatility has been very small.<sup>46</sup>

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<sup>45</sup> The paper defined “market disruption” as “the effects of large, rapid market declines that threaten to create panic conditions, or disorderly market conditions.”

<sup>46</sup> See especially Campbell, John Y., Martin Lettau, Burton G. Malkiel, and Yexiao Xu (2001): Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk, *Journal of Finance* 56, 3-43. Harris L., (1989): S&P 500 Cash Stock Price Volatility, *Journal of Finance* 44, 1155-1175 reported that S&P equities became statistically more volatile after the introduction of the S&P 500 futures trading; however the differences between the volatility before and after the equity index futures trading is economically insignificant. In addition, Edwards, F.R. (1988): Futures Trading and Cash Market Volatility: Stock Index and Interest Rate Futures, *Journal of Futures markets* 8, 4212-4439 found a small, statistically significant decline in cash volatility, and Schwert, W. (1990): Stock Market Volatility, *Financial Analyst Journal*, May/June, 23-34 found that futures trading appears not to have significant impact on stock market volatility. Grossman also suggested that market makers in equity futures markets combined with market makers at the New York Stock Exchange enhance the overall liquidity of the equity market. Bessembinder, H. and Seguin, P.J., (1992): Futures Trading Activity and Stock price Volatility, *Journal of Finance* 47, 2015-2034 found evidence in daily S&P 500 data that supported the theoretical arguments suggested by Grossman that the introduction of equity futures increases market depth and liquidity of the equity market and hence decreases stock market volatility. See also, Miller.M. 1990. *Index Arbitrage and Volatility*. In *Market Volatility and Investor Confidence*. New York: New York Stock Exchange; Miller.M. and

In terms of regulatory approach, the survey responses indicate that market authorities approach potential stock-index related volatility by utilizing tools that are generic to all exchange-traded products – e.g., trading halts, increased surveillance, price limits, final trading day restrictions, and settlement rules. (See SC2 and Consultative Committee member responses to survey question 25.)

This suggests that market authorities have responded to the issue of short-term market volatility in an evolutionary and broad-based way and that many market operators now operate various rules and procedures to control intra-day volatility. These range from controls on the pricing of order input to automatic suspension if prices move to predetermined floors or ceilings. The variety of controls reflects the finding noted in the IOSCO Technical Committee’s *Report on Trading Halts and Market Closures* (2002) that:

‘All jurisdictions have arrangements in place for regulators and/or markets to implement trading interruptions. Although all jurisdictions have trading interruption procedures of some kind, based on broadly similar objectives, the detail of these arrangements is tailored to local circumstances and often varies considerably.’

To a large extent the widespread introduction of short-term volatility controls appear to have reduced the perceived need in many markets for the introduction of market-wide circuit breakers. Although exchanges in North America retain circuit-breakers, other jurisdictions have not adopted market-wide measures.

In conclusion, the survey responses reveal that market authorities continue to address any potential volatility issues related to the trading of indexed products through the use of existing methods of general application to all traded instruments (as also described in the *Trading Halt* report<sup>47</sup>) and have not considered it necessary to propose any new approaches. However, the Technical Committee encourages both regulators and market operators monitoring market developments in this area to identify any emerging risks and to keep the adequacy of their risk mitigation programmes under review.

#### **E.4 Oversight and information-sharing**

The various interactions between derivative and cash markets, including the increasing international dimension, create considerable potential for market disorder and/or market abuse. It is therefore important to ensure not only that there are adequate oversight arrangements within individual markets but also that there

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Muthuswamy.J and Whaley.R. 1994. *Predictability of S&P 500 Index basis change: Arbitrage induced or statistical illusion?* Journal of Finance 44 (June): 479-514.

<sup>47</sup> See *Report on Trading Halts and Market Closures* (IOSCO 2002) for an evaluation of the risks associated with differing regulatory approaches to trading halts.

are appropriate co-ordination and information-sharing arrangements between markets and between markets and regulators.

### **Market surveillance**

The survey responses submitted by SC2 and Consultative Committee members confirm that markets and regulators have adopted various measures, including electronic systems, position reporting requirements, record-keeping requirements, and surveillance procedures to facilitate market surveillance. For example, surveillance personnel may monitor unusual changes in price, volume, or open interest, or closely monitor trading at the expiration of a derivatives contract. Many jurisdictions have transaction audit trail requirements.<sup>48</sup>

Nearly all jurisdictions also have laws, regulations, or market rules requiring the reporting of large futures or options positions and other information to regulators or market operators. In several jurisdictions, large open positions must be reported on a daily basis. In some jurisdictions, large open positions are routinely reported directly to the regulatory authority, while in others position information is provided to regulators on request. This information may lead exchanges or regulators to investigate the reason for changes in large open positions, e.g. hedging or arbitrage activity.

All jurisdictions prohibit front-running through some combination of statutes, regulations, or market rules.<sup>49</sup> Several respondents noted that exchanges in their jurisdictions have adopted specific surveillance measures designed to detect front-running.

### **Enhanced inter-market and cross-border cooperation**

Recognising the problems that could occur in the trading of related instruments in different venues, including overseas venues, *the 1992 Report* recommended:

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<sup>48</sup> An audit trail is a record of trading information identifying, for example, the brokers participating in a transaction, the firms clearing the trade, the terms and time of the trade, and, ultimately, and when applicable, the customers involved.

<sup>49</sup> Front-running generally refers to illegal activity in which a trader takes a position in a security in advance of an action which he/she knows a customer (or his/her brokerage) will take that likely will move the security's price in a predictable fashion.

- information exchange, discussion and co-operation in respect of contract design between and/or among regulatory authorities, the exchange(s) on which the derivative product trades and the underlying cash markets;<sup>50</sup>
- the pursuit of desirable, co-ordinated measures between the cash and derivative markets to minimise the effects of potential market disruption;
- where derivative products are based on foreign stock indices, international co-operation of regulatory authorities and related cash and derivative markets by means of information exchange and discussion in order not to impair orderly pricing in either the cash or derivative market and to avoid the risk of disruption, including manipulation, in both markets;
- open and timely information sharing as a means of facilitating regulatory decision making during periods of large, rapid price declines;
- efforts by regulatory authorities to achieve international consultation and co-ordination of policy measures in anticipation of occasional large, rapid price movements, including, in the case of markets trading derivatives products based on foreign cash markets, coordination to the extent possible (consistent with the public interest, such as the protection of investors and the maintenance of fair and orderly markets) with the measures taken by the underlying stock markets so as not to reduce the effect of the measures, and vice versa.

Responses to the SC2 and Consultative Committee member surveys indicate that a considerable amount of both formal and informal co-ordination arrangements are in place. There has also been a steady increase in the level of cross-border co-operation between exchanges and between regulatory authorities over the past decade.

With regard to information-sharing arrangements among the cash and derivatives markets and among regulators, responses from SC2 members show that several kinds of information-sharing arrangements are in place between markets and regulators. These include formal agreements as well as informal arrangements aimed at improving coordination and surveillance of the derivatives and cash markets at both local and international levels.

*Coordinated surveillance.* In some jurisdictions, the same entity operates the cash and the derivatives markets and the surveillance personnel of those markets share information. In at least two jurisdictions where the cash and derivatives markets

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<sup>50</sup> Exchange of information, discussion and cooperation between and/or among the regulatory authorities, the exchange on which the derivatives product trades and the underlying cash markets are also valuable in examining contract design.

are separate entities, the markets have entered into informal agreements to share information.

In several jurisdictions, the cash and derivatives exchanges in the jurisdictions have entered into Memoranda of Understanding (“MOUs”) that provide for the sharing of information.

*International coordination and information sharing.* While several jurisdictions reported that they trade derivative products based solely on domestic securities, many now trade a wider range of instruments. Several noted that the Intermarket Surveillance Group (“ISG”)<sup>51</sup> provides a cross-border mechanism for sharing surveillance information and co-ordinating inquiries and investigations designed to address potential inter-market manipulations and trading abuses, including front-running.

In addition, one survey respondent noted that there is coordinated surveillance in its jurisdiction for products listed on certain foreign markets.

One respondent stated that domestic exchanges in its jurisdiction planned to enter into additional MOUs with foreign exchanges. Another regulatory authority stated that it planned to continue to pursue MOUs with various regulators to strengthen cross-border coordination. Most respondents indicated that they had no concerns regarding foreign or domestic inter-market coordination related to stock index derivatives products.

Significantly, members of the Consultative Committee state that they have not experienced problems related to co-ordination between exchanges.<sup>52</sup> MOUs between exchanges and between exchanges and regulators, as well as participation in the ISG, have to date proved to be an effective means of helping to ensure proper coordination and surveillance of the activities related to stock index derivatives products. In addition, the use of shared databases by markets, when the derivatives product and the underlying index are traded on different markets, has proved to be valuable in the performance of market surveillance functions.

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<sup>51</sup> The Intermarket Surveillance Group (“ISG”) was created under the auspices of the SEC in 1983 as a forum to ensure that national securities exchanges and national securities associations adequately share surveillance information and coordinate inquiries and investigations designed to address potential intermarket manipulations and trading abuses. All national securities exchanges and national securities associations (*i.e.*, NASD) in the United States are full members of the ISG. Futures exchanges and non-U.S. exchanges and associations are affiliate members of the ISG. Affiliate members are required to share information on a more limited basis with the ISG. Full members routinely share a great deal of surveillance and investigatory information, and the SEC believes that this framework has proven to be an essential mechanism to help ensure that there is adequate information sharing and investigatory coordination for potential intermarket manipulations and trading abuses.

<sup>52</sup> See Appendix 8.

## **Assessment**

The major challenge for exchanges and market authorities over the past decade has been to step up their daily market oversight arrangements to keep pace with the huge growth in trading volumes and the sophistication of the index derivative markets.

Although growth in index products based on foreign securities or baskets of securities from multiple jurisdictions has been relatively slow, this seems likely to increase in dimension. This process also could be accompanied by market structure developments that for operational reasons place derivative and underlying securities platforms in different jurisdictions. These developments potentially add complexity to the oversight process. Markets and regulators may need both to have appropriate communication and co-ordination processes with a wider range of foreign counterparts and also to be mindful of the needs of those counterparts.

The Technical Committee considers that the survey responses demonstrate a high level awareness of these developments and their implications. Moreover, since the issuance of *the 1992 Report*, both the Technical Committee and other regulatory and derivatives industry groups have addressed in depth the above issues concerning the need for open and timely communication among market authorities, coordination between cash and derivative markets and international coordination.<sup>53</sup> These initiatives collectively have led to the development of:

- procedures to better coordinate and respond to a market crisis once it has materialized;
- initiatives to increase the transparency of market protection procedures;

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<sup>53</sup> See Principles for Cooperation in Regulation and Principles for the Secondary Market in the IOSCO Objectives and Principles of Securities Regulation (as revised 2002), which draw, among others, on the following reports: Transparency and Market Fragmentation (2001), Principles for the Oversight of Screen-Based Trading Systems for Derivative Products Review and Additions (2000), Supervisory Framework for Markets (1999)(allocation of supervisory responsibilities), Application of the Tokyo Communiqué to Exchange-Traded Financial Derivatives Contracts (1998), Information Sharing Guidance (1997), Report on Cooperation Between Market Authorities and Default Procedures (1996), Regulatory Cooperation in Emergencies (1996), Mechanisms to Enhance Open and Timely Communication Between Market Authorities of Related Cash and Derivative Markets During Periods of Market Disruption (1993). See also Report on Trading Halts and Market Closures (2002).

The international response to the Barings and Sumitomo events also resulted in substantial work as discussed in the Report on the Improvement of Cooperation and Coordination in the Surveillance of Securities and Futures Transactions by IOSCO's Secretary General (1996) and Final Report from the Co-Chairmen of the May 1995 Windsor Meeting to the Technical Committee of IOSCO (1996). See also Tokyo Commodity Futures Markets Regulators' Conference (1997), the Windsor Declaration (1995), and Financial Integrity Recommendations for Futures and Options Markets and Market Participants (FIA Global Task Force on Financial Integrity 1995).



- initiatives to encourage the development of “best practices” concerning market default procedures and the treatment of positions, funds and assets to contain systemic risks; and
- The development of large exposure information sharing arrangements, among exchanges and among regulators, that permit an integrated multilateral assessment of market risk.<sup>54</sup>

While the Technical Committee does not consider that there is specific guidance it could usefully add to existing IOSCO guidance at this point, it stresses that both markets and regulators should periodically review the risks to which they may be exposed and the adequacy of the oversight and co-ordination arrangements in this area, particularly if there is significant growth in the market for transnational, less diversified index products.

## **Conclusions and Recommendations**

This report has considered a number of issues relevant to regulators and market operators as a result of the greatly increased significance over the past decade of indices, index-led investment strategies and index-related products. In particular, there has been a significant growth in the number and sophistication of indices published, in the volumes of investor assets invested under index-led investment strategies and in the range and use of index-related trading instruments.

These developments have presented a range of issues in terms of maintaining the orderly and efficient workings of markets, not least because of the continuous interaction between derivative and underlying cash markets and the latent potential for manipulation. It was largely in recognition of these factors that the Technical Committee published *the 1992 Report*, and the reason why a central

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<sup>54</sup> Following the Barings crisis, derivatives markets implemented the Financial Integrity recommendations of the FIA Global Task Force and created an international information sharing memorandum of understanding (International MOU) pursuant to which the occurrence of one or more triggering events (e.g., decrease in core financial resources, large cash flows in either the proprietary or customer accounts of a member firm, or a concentration of positions in any futures or options contract) will allow a derivatives market or clearinghouse to request information from one or more of the participating exchanges or clearinghouses. As of December 2002, 68 exchanges and clearing organizations had signed the [International MOU?].

In addition, the regulators of the signatories to the International MOU signed a companion Declaration on Cooperation and Supervision of International Futures Markets and Clearing Organizations (Declaration). Under the Declaration, the occurrence of agreed triggering events affecting an exchange member’s financial resources, positions, price movements or price relationships, or events suggesting manipulation or other abusive conduct, will prompt the sharing of information. As of December 2002, 29 regulators had signed the arrangement.

part of this report has been to consider whether those recommendations require updating in light of subsequent experience. Additionally, the report has considered other relevant issues that have arisen in the course of market development, in particular those relating to index rebalancing, the increased use of index-led investment strategies, the development of less diversified index derivatives and the growing international nature of many of these developments. The Technical Committee's findings and recommendations are as follows.

## **Indexation issues**

### ***Transparency***

The Technical Committee notes the huge increase in the number and range of indices published and their increased significance to many aspects of investment, trading and market operation. It also notes the increase in the international characteristics of index provision, in particular the creation and management of indices by international index providers and the increasing number of indices based on securities from more than one jurisdiction.

Member jurisdictions do not regulate index provision. Rather, market regulation focuses on the regulation of products and trading activity related to indices. The Technical Committee has found no evidence during this project that any jurisdiction considers it desirable to alter that balance. It notes that existing practices reveal various levels of contact among index providers, markets and regulators to facilitate the disclosure of information relevant to the rebalancing of indices, including the timing of rebalancing actions, and of cooperation, from index providers, in providing market authorities with information that may be relevant to carrying out their market and investor protection obligations. Given the potential impact on markets of new information relating to indices and of index 'events', the Technical Committee stresses the importance of relevant information on indices being available widely on a timely basis. It therefore encourages:

- contact between regulators, market operators, and index providers, with a view to minimising the risk of disorderly markets;
- index providers to provide on as wide and timely a basis as possible material information for market users in respect of such matters as index calculation and rebalancing methodologies, changes in the composition of the index, the timing and manner of implementation of any index changes and information relating to any operational difficulties in providing timely or accurate index information; and
- market operators to promote the timely disclosure to the public of the information collected from index providers.

## ***Rebalancing***

The rebalancing of indices, an essential part of the process of ensuring that an index meets its objectives as a relevant and accurate measure on a continuing basis, inevitably involves additional trading activity in affected securities around the time of rebalancing. The principal findings of the Survey are that: (a) the price impact on securities added to and deleted from an index following a rebalancing is viewed as short term, and (b) market authorities rely on existing mechanisms and close monitoring of markets to address the potential for disorderly pricing arising from trading activity associated with index rebalancing.

The Committee considers that regulators and markets have a variety of tools with which to address index rebalancing issues and that these appear to work effectively. However, an important element in helping to ensure that rebalancings are conducted in an orderly manner is to ensure that the process is conducted with sufficient transparency. In this respect, the Technical Committee stresses the importance of market operators and, as appropriate, regulators:

- seeking and making available to market users as much relevant information as they can obtain in relation to rebalancing, including the method of determining entry prices of securities added to an index;
- increasing surveillance activity as appropriate to monitor trading (and if appropriate, issuer announcements) around the time of rebalancing; and
- pursuing co-ordination with other relevant parties, including other market operators, index providers and regulatory authorities.

## **Index-led investment strategies**

Index-led investment strategies, whether through individual portfolio construction or through index-related products (such as ETFs), have grown substantially in recent years. While these strategies may have attracted new funds and new liquidity to some markets, they have also caused some discussion on both index composition and as to whether, because of their essentially technical nature, index-led investment strategies may have tended to drive prices away from ‘fair value’ or increase volatility, at least in the short-term.

In terms of index utility and quality, professional users of indices are generally demanding users and, in many areas, there is scope for competition in index provision. Moreover, even where an index may poorly represent a market this would not necessarily result in a misallocation of capital. Investment managers can be expected to engage in arbitrage-like strategies that eliminate excess risk-adjusted returns and, ultimately, any mispricing.

In respect of index-tracking behaviour, the Technical Committee does not consider there is as yet sufficient micro analysis of the recent bull and bear

markets to assess whether there are issues flowing from indexation specifically that might have implications for the regulation of secondary markets. However, as with other significant new features of market behaviour, the Technical Committee stresses the importance of regulators remaining alert to changing patterns in market dynamics and considering whether new issues arise.

### **Contract Design of stock index derivative products**

Appropriate contract design remains fundamental to ensuring that index derivatives serve their purpose efficiently and minimise the scope for disorderly trading or manipulation. The Technical Committee set out considerations for contract design in its 1992 *Contract Design Paper* and concludes that those design criteria have provided an appropriate and flexible framework for the development of stock index products. In this regard the Technical Committee wishes to reiterate that it intended that the design criteria should be applied flexibly and that the application of any particular point may vary depending upon the design of the index.

In all cases, the goal in applying these points is to assess whether the product design has the potential to impair orderly pricing in either the cash or derivative market, or involves a risk of causing disruption, including manipulation, of those markets.

The application of these design points is most straightforward in the case of broad-based indices. For non-diversified indices, individual points may be relevant to a greater or lesser extent. For example, for a non-diversified index, point (ii) relating to the number of component stocks and point (iv) relating to component stock dispersion may be inconsistent with the intention to design such a non-diversified (i.e. narrow-based) product.

For such non-diversified indices where a particular design point is only partly satisfied, or it is inapplicable, market authorities may require compensating measures to achieve the goal of maintaining orderly markets and preventing manipulation. In such cases, market authorities should consider the need for, and expected effectiveness of, special or more intensive surveillance procedures, margin requirements, position limits, etc. to achieve the goals stated above.

The Technical Committee has therefore determined that the points on the 1992 *Contract Design Paper* should be supplemented. The content of some of the new points below was discussed in the 1992 paper, and the Technical Committee considers it appropriate to formally include these new points in light of their importance to the assessment of the contract design elements and the continuing development of index products since 1992.

Accordingly, the Technical Committee considers that the following points should be taken into account when a new derivative index product is introduced.

Existing design points and proposed changes	Revised design points
<p><b>i. The method of calculation: Whether the index is calculated in an appropriate way including the weight given to component stocks so that the price movements of a few particular components do not exert undue influence on the movement of the index. In addition, the index calculation formula should be made available to the public.</b></p> <p><b>Change: Final sentence becomes basis of new point vii.</b></p>	<p><b>i. The method of calculation: Whether the index is calculated in an appropriate way including the weight given to component stocks so that the price movements of a few particular components do not exert undue influence on the movement of the index</b></p>
<p><b>ii. The number of component stocks: Whether the index is composed of a sufficient number of stocks of non-affiliated issuers so that the price movements of a few particular component stocks do not exert undue influence on the movement of the index.</b></p> <p><b>Change: None</b></p>	<p><b>ii. The number of component stocks: Whether the index is composed of a sufficient number of stocks of non-affiliated issuers so that the price movements of a few particular component stocks do not exert undue influence on the movement of the index.</b></p>
<p><b>iii. The liquidity of component stocks: While there may be great</b></p>	<p><b>iii. The liquidity of component stocks: While there may be great</b></p>

<p><b>differences in the liquidity of component stocks, whether each component stock has sufficient liquidity so that the trading of such stock does not exert undue influence on the movement of the index.</b></p> <p><b>Change: None</b></p>	<p><b>differences in the liquidity of component stocks, whether each component stock has sufficient liquidity so that the trading of such stock does not exert undue influence on the movement of the index.</b></p>
<p><b>iv. The dispersion of component stocks within a business sector or across sectors: Whether the component stocks are broadly based so that the price movement of stocks belonging to a certain business sector does not exert undue influence on the movement of the index.</b></p> <p><b>Change: none</b></p>	<p><b>iv. The dispersion of component stocks within a business sector or across sectors: Whether the component stocks are broadly based so that the price movement of stocks belonging to a certain business sector does not exert undue influence on the movement of the index.</b></p>
<p><b>v. The replacement of component stocks: Whether there is a non-arbitrary and well-publicized procedure for reconsideration of the appropriateness of continuing to include index component stocks, either on a regular basis or as occasion demands.</b></p>	<p><b>v. The replacement of component stocks: Whether there is a non-arbitrary and well-publicized procedure for reconsideration of the appropriateness of continuing to include index component stocks, either on a regular basis or as occasion demands.</b></p>

<p align="center"><b>Change: None</b></p>	
<p align="center"><b>vi. The selection of component stocks: In order to prevent the index from being unduly influenced by price movements of particular component stocks, whether such stocks are selected in full consideration of items (i) through (iv) above.</b></p> <p align="center"><b>Change: None</b></p>	<p align="center"><b>vi. The selection of component stocks: In order to prevent the index from being unduly influenced by price movements of particular component stocks, whether such stocks are selected in full consideration of items (i) through (iv) above.</b></p>
<p align="center"><b>Change: existing point vii becomes point viii, giving way to new point vii concerning index transparency.</b></p>	<p align="center"><b>vii. Index transparency: New point Whether there is timely and widely available information about the index calculation formula, component selection criteria and index rebalancing.</b></p>
<p align="center"><b>vii. Clearance and settlement: Whether the procedures for clearance and settlement are prudentially designed and interact effectively with the cash market.</b></p> <p align="center"><b>Change: Becomes point (viii), with supplementary text.</b></p>	<p align="center"><b>viii. Clearance and settlement: Whether the procedures for clearance and settlement are prudentially designed and interact effectively with the cash market and whether settlement of the contract is at a price reflecting the underlying cash market, minimizes</b></p>

	<p><b>the potential for manipulation or distortion and is based on a reliable and publicly available cash price.</b></p>
<p><b>Change: New point ix, concerning orderly market and anti-manipulation mechanisms.</b></p>	<p><b>ix. Orderly markets and anti-manipulation mechanisms. Whether appropriate and effective mechanism are in place to maintain orderly markets and prevent manipulation of the markets for the index products and component securities, and whether for non-diversified indices more aggressive surveillance and added protections with respect to prevention of abusive trading may be required.</b></p>
<p><b>Change: New point x, relating to cooperation arrangements.</b></p>	<p><b>x. Cooperation arrangements. Whether appropriate and effective arrangements are in place so that relevant regulatory and market authorities can share information about the implementation of items (i) through (ix) above and about market activity in relevant index products and component</b></p>



### **Market oversight**

The Technical Committee considers that market integrity and investor protection concerns with regard to the trading of stock index derivatives products, and the rebalancing of the underlying indices, have been and should continue to be appropriately addressed through the rigorous application of the design criteria, market surveillance, and inter-market and cross-market consultation and coordination recommendations as set forth in the *IOSCO Objectives and Principles of Securities Regulation*.

In doing so, the Committee notes the survey findings that: (a) market authorities generally rely on a variety of existing mechanisms, such as enhanced surveillance (particularly at critical pricing points) and trading halts, including circuit breakers and price limits, to address volatility; (b) there have been no systemic surveillance problems or concerns identified with regard to foreign or domestic inter-market co-ordination related to trading in stock index derivative products; (c) market authorities rely on a variety of inter-market and cross-market co-operative mechanisms and that no material changes are contemplated.

However, the Committee is conscious that the marketplace continues to develop and that market oversight needs to keep pace with: the further internationalisation of indices and the trading of index-related products and the increased use of non-diversified products.

In respect of the above, because different contract designs for equity-based index products may require enhanced surveillance and added protections with respect to prevention of abusive trading or misuse of information, the Technical Committee encourages members to:

- implement, as appropriate, existing Technical Committee recommendations concerning enhanced surveillance and inter-market and cross-border cooperation and coordination;
- review the adequacy of existing regulations and supervisory procedures in order to ensure a high level of implementation of the IOSCO Objectives and Principles of Securities Regulation; and
- enter into, and encourage their regulated markets to enter into, arrangements to communicate with each other effectively and share needed information in order to take appropriate decisions in a timely manner and to review the adequacy of those arrangements periodically in light of market developments.

The Technical Committee also re-emphasises the importance, as mentioned earlier in these conclusions, of both regulators and market operators monitoring new

market developments in this area to identify any emerging new risks and reviewing the adequacy of their risk mitigation programmes.