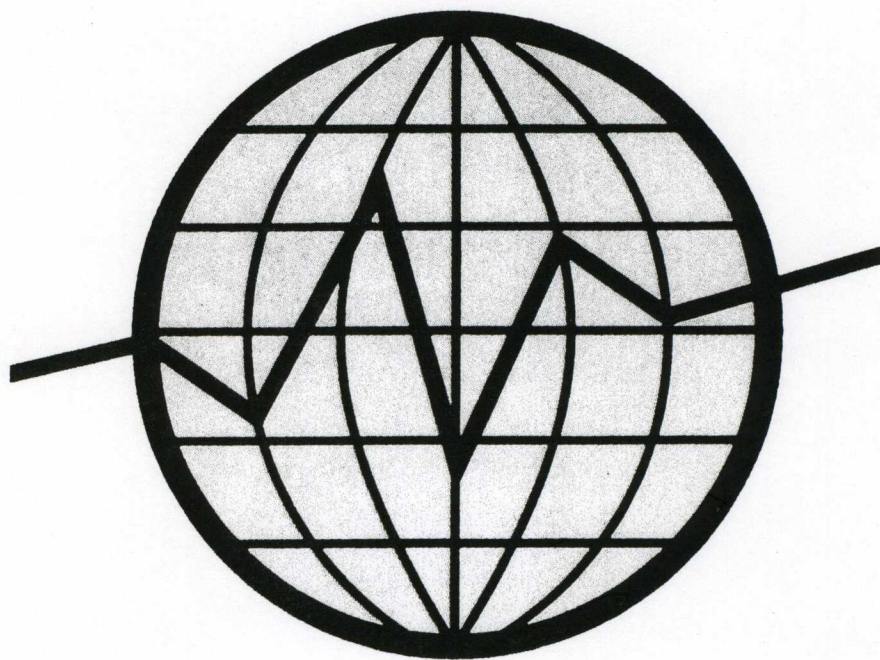


**INTERNATIONAL ORGANIZATION  
OF SECURITIES COMMISSIONS**

**TRANSPARENCY  
ON SECONDARY  
MARKETS**

**A synthesis of the IOSCO debate**



IOSCO  
Technical Committee  
Working Party on the Regulation  
of Secondary Markets

# TRANSPARENCY ON SECONDARY MARKETS

A synthesis of the IOSCO debate

December 1992



Members of the Working Party on the Regulation of Secondary Markets who participated in the work of Market Transparency:

Securities Bureau of the Ministry of Finance, Japan (Chairmanship)  
Australian Securities Commission, Australia  
Commission des Opérations de Bourse, France  
Federal Ministry of Finance, Germany  
Commissione Nazionale per le Società e la Borsa, Italy  
Securities Board of the Netherlands, The Netherlands  
Commission des Valeurs Mobilières du Québec, Quebec  
Comisión Nacional del Mercado de Valores, Spain  
Association of Swiss Exchanges, Switzerland  
Securities and Investments Board, United Kingdom  
Commodity Futures Trading Commission, United States  
Securities and Exchange Commission, United States

This discussion paper was prepared inside the Market Division of the CONSOB for the meetings of the IOSCO Working Party on the Regulation of Secondary Markets.

The views expressed by the members of this Working Party should not be considered as representing the official positions of IOSCO or of the regulatory authorities they belong to.

ISBN 88-7187-263-0

© 1993 Il Sole 24 Ore Società Editoriale Media Economici  
Seme S.p.A. - Divisione Libri  
Sede legale: via Lomazzo 52, 20154 Milano  
Redazione e amministrazione: via Parabiago 19, 20151 Milano

Redazione: Milka Gandini

Prima edizione: aprile 1993

## Contents

9	<i>Introduction and outline of the paper</i>
13	Fairness
13	Market integrity and fiduciary duties
14	Market transparency and fairness
	a) Disclosure versus reporting
	b) Transparency and self-monitoring of execution
17	Conclusions
19	Efficiency
19	2.1. Immediacy and price discovery
	a) Liquidity and immediacy
	b) Price discovery
21	2.2. Relating fairness and efficiency
23	3. Transparency
	a) Pre-trade information
	b) Post-trade information
	c) Measuring transparency: a real-time standard
29	4. How much transparency does a market need?
30	4.1. Market microstructure
30	4.1.1. Is market microstructure a relevant determinant of secondary market transparency?
31	4.1.2. Market microstructure and liquidity
	a) Specialists versus market makers
	b) Limit orders and liquidity
33	4.1.3. Market microstructure and fairness
34	4.1.4. Empirical evidence

36	4.2.	Asymmetric information	59
		a) Price discovery and asymmetric information	
		b) Pre-trade and post-trade disclosure: substitutes or complements?	
		c) Price discovery and passive trading: winners and losers	
		d) Empirical evidence on asymmetric information and passive pricing	
		e) Conclusions	
42	4.3.	Transaction size	63
42	4.3.1.	Institutions and blocks trading	
43	4.3.2.	Real-time disclosure of block trades	
		a) The case for opaqueness	
		b) The case for transparency	
45	4.3.3.	Empirical evidence	68
		a) The NASDAQ case	
		b) The domestic SEAQ case	
		c) Screen-based trading	
		d) Conclusions	
48	4.4.	Wholesale and retail markets	72
		a) The case for protecting limit orders	
		b) The case for protecting market makers	
		c) Conclusions	
50	4.5.	Inter-exchange competition	77
50	4.5.1.	The case for free competition	
52	4.5.2.	The case for regulation	
		a) Opaque retail market competing with transparent retail market	
		b) Opaque wholesale market competing with transparent retail market	
		c) Opaque wholesale market competing with transparent wholesale and retail market	
		d) Who gains and who loses from opaqueness	
		e) Empirical evidence	
		f) Conclusions	
59	4.6.	Domestic regulation of secondary market transparency	77
59	4.6.1.	Policy trade-offs	
		a) Free competition among exchanges versus price discovery and fairness	
		b) Price discovery versus price stability	

59	4.6.2.	Transparency	59
		a) The case for transparency	
		b) The case against transparency	
63	5.	Discussion of possible proposals for international regulation of secondary market transparency	63
63	5.1.	The case for harmonizing secondary market transparency for internationally traded stocks	63
		a) Introduction	
		b) The case for regulation: objectives	
		c) Who should be in charge of the regulation?	
68	5.2.	Discussion of proposals on secondary market transparency put forward by IOSCO members	68
		a) The lead regulator approach	
		b) The real-time transparency standard	
		c) A weaker version of the real-time standard	
		d) Do nothing	
		e) Implementation issues	
72	5.3.	Is market transparency the only possible instrument for promoting fairness and efficiency?	72
		a) Order flow integration	
		b) Screen-based trading	
		c) Circuit-breaker mechanisms	
		d) Inter-exchange front running	
		Further analysis	

## List of Abbreviations

AMEX	American Stock Exchange
CAC	Cotation Automatisée en continu
CBT	Chicago Board of Trade
CFTC	Commodity and Futures Trading Commission
CME	Chicago Mercantile Exchange
COB	Commission des Opérations de Bourse
CONSOB	Commissione Nazionale per le Società e la Borsa
IBIS	Integriertes Börsenhandels und Informations-System
IOSCO	International Organization of Securities Commissions
ITS	Inter-market Trading System
LSE	London Stock Exchange
NASD	National Association of Securities Dealers
NASDAQ	National Association of Securities Dealers Automatic Quotation
NYSE	New York Stock Exchange
OFT	Office of Fair Trading
SEAO	Securities Exchange Automatic Quotation
SEC	Securities and Exchange Commission
SIB	Securities and Investments Board
SRO	Self Regulatory Organization

## Introduction and outline of the paper

This paper analyzes the relation between secondary market transparency and the regulatory goals of fairness and efficiency.

The analysis is a result of the meetings of the IOSCO Working Party on the Regulation of Secondary Markets, which met first in Zurich in September 1991 under the mandate of the IOSCO Technical Committee.

At that meeting, the Working Party decided to produce two papers that would analyze the link between secondary market transparency and market fairness and efficiency from the two perspectives of order driven and quote driven markets. The first discussion paper was assigned to the SEC representatives and the second to the SIB representatives. A third paper on the topic was produced by the CONSOB representatives.

At the Paris meeting of the IOSCO Working Party on the Regulation of Secondary Markets, held on January 9-10, 1992, it was agreed that the CONSOB would draft a further paper on transparency that would synthesize and compare the three papers prepared by the SEC, the SIB and the CONSOB. The amendments to the first draft of the paper (released in March 1992) submitted by the SEC, the SIB, the CFTC, the COB, the Bundesministerium der Finanzen and the Australian Securities Commission are also included.<sup>(1)</sup>

At the Quebec meeting held in July 1992, the Technical Committee agreed to publish the synthesis as a contribution to the debate on the regulation of secondary markets.

<sup>(1)</sup> This paper has been drafted by Alberto Cybo-Ottone of the Market Division of the CONSOB.

The aim of this paper is to analyze the determinants of secondary market fairness and efficiency and to evaluate the role of transparency in achieving these objectives. The focus is on securities markets.

During the Working Party meetings and most notably in the three discussion papers, a number of different views emerged on the role of market transparency in achieving the objectives of fairness and efficiency.<sup>(2)</sup>

More importantly, differing views also emerged on the evaluation of the issue that IOSCO should address. According to one approach, the issue for IOSCO is whether regulators can agree on the identification and weighting of the elements of fairness and efficiency and market microstructure which will encourage the maximum participation of all investors in securities markets without dictating the type of structure which is appropriate to any particular market.

According to another approach, the issue is inter-exchange competition and its bearing on market efficiency and fairness. In this respect, the analysis contained in the paper provides an instrument for the evaluation of a number of possible Draft Principles, including a status quo option, for international coordination on these issues.

The paper confronts all the arguments and counter-arguments put forward in the individual papers with the aim of identifying points of agreement and disagreement. Reference is also made to the available empirical evidence on the debated issues.

The paper is organized as follows.

Sections 1 to 3 deal with the definitions of Fairness, Efficiency and Market Transparency.

<sup>(2)</sup> As a general matter, the staff of the Securities and Exchange Commission believes that real-time trade and quote publication has provided, and continues to provide, important benefits for both auction and dealer markets in the US. In particular, the SEC staff believes that real-time trade publication is critical for effective investor protection. In addition, such publication increases the integrity of markets, fosters investor confidence and contributes to market liquidity. Further, by minimizing the potential negative effects of fragmentation, pricing efficiency is enhanced. In sum, the US equity markets (whether auction or dealer, order or quote driven) operate with a high degree of transparency. The SEC staff believes that such transparency is critical to both market efficiency and fair treatment of investors.

Section 4 identifies a number of factors that influence market fairness and efficiency, and how they are related to transparency.

Section 5 considers the regulation of market transparency in an international environment and compares the proposals for international regulation put forward by a number of IOSCO members.

# 1. Fairness

A fair market can be characterized by the presence both of measures for promoting market integrity and of fiduciary duties of financial intermediaries when dealing with customers.

One view sees market transparency as an additional requirement for a fair market. This view is not uniformly shared, however.

## 1.1. Market integrity and fiduciary duties

There are a number of regulatory instruments that help to foster market fairness:

- Market integrity is promoted by prohibition of market manipulation and insider trading.
- Fair treatment of investors becomes an issue for regulators when investors access the market through a financial intermediary; it is achieved through regulation of market participants' relationships with their clients (suitability and best execution requirements, prohibition of front running).

In other words, a fair market is one where, at the minimum, investors are: protected from fraudulent practices (such as insider trading and front-running); accorded fiduciary rights when their intermediaries are acting in a fiduciary capacity (such as the right to obtain best execution and the right not to be disadvantaged by acts of the fiduciary); and, finally, treated generally in a just and equitable manner by market professionals in accordance with rules of business conduct (an example of these rules is the provision of price and time priority for limit orders in auction markets).

## 1.2. Market transparency and fairness

Fair disclosure of information means avoiding excessive disparity of information on the factors that are likely to have an impact on prices. In particular, our discussion focuses on the disclosure of quote, price and trade volume information.

Disagreement emerges regarding the role of transparency in achieving fairness.

According to one view, all investors should be provided with equal opportunity to gain access to real-time market information. Equal access to this information is a means of promoting a number of important goals. In both "order-driven" and "quote-driven" markets, the widespread dissemination of real-time market information ensures efficient pricing of securities and efficient allocation of capital.

According to another view, pre-trade transparency can be as important as post-trade transparency for informing investors of the prices at which deals can be struck. While post-trade transparency may also contribute to the fairness of the price formation mechanism, it must be weighted against the need to retain risk-bearing intermediaries (such as market makers) in a quote-driven market. Liquidity will be impaired if the level of transparency exposes market makers to undue position risk, and therefore a balance needs to be struck between transparency and immediacy.

Two specific areas where the disagreement applies are exemplified below: the difference between disclosure to the exchange and to the public at large and the role of investors as self-monitors of transaction accuracy.

### a) *Disclosure versus reporting*

Those who question the need for market transparency make a sharp distinction between the need to report all secondary market information to the exchanges and to regulators, who use these data to enforce anti-manipulation and anti-insider laws, and the need to disclose all this information in real-time to the market at large.

The idea is that such laws, if properly enforced, are sufficient

deterrents for insiders and manipulators. In particular, as a result of the SRO monitoring and prosecution process, price discovery in the market is considered as fair even if some secondary market information is not disclosed to the public.

Those who consider market transparency as a necessary goal insist on the need for wider minimal disclosure obligations to ensure that market participants are on an equal footing when their orders are executed on the Exchange. The key argument is that exchange monitoring and regulation is not a sufficient deterrent, both because there is no easy way to refund the losers (offences come under criminal law, which works only as an *ex ante* deterrent, rather than civil law, which requires *ex post* refunding of the damaged party) and because a large number of offences are not prosecuted. In this sense, by observing real-time information on prices and volumes, individual investors are in a better position to choose the best time and place to trade.

In order to substantiate this view, reference can be made to the evidence, based on the early days of federal regulation of the US securities markets, that reliance solely on regulatory reporting is inadequate, and that investors are the best policemen of their own markets. Widespread dissemination of real-time market information enables investors to determine for themselves whether they have received the best execution of their trades or been the victim of abusive trading, such as front-running.

### b) *Transparency and self-monitoring of execution*

Another aspect of the relationship between reporting and disclosure arises in discussing the role of real-time disclosure of price and volume data in enabling investors to monitor the execution of their orders.

The argument in favour of transparency is that when publication is not mandatory, it is difficult for investors to measure the real cost of execution. For example, relying on quotes is not always effective: if we consider the quality of execution, the quote-driven system provides only the maximum price and not the minimum one even if prices are com-



pletely firm; investors with greater bargaining power could obtain execution at a better price than small investors and adherence to the best execution rule could be questionable in these cases.

Another possible way of checking the quality of execution would be for investors to refer to audit trail data given by their broker; however, the individual investor would have considerable difficulty in finding out what was the relevant market price at the time of execution.

A counter argument can be made, however. Since it is a general principle of securities markets that transactions cannot be reversed, the provision of transactions data in real-time (to enable investors to monitor best execution) would not appear to be necessary. Concern about the bargaining power of institutions is not relevant to dealer markets, which are characterized by bilateral negotiation and where the cost relative to transaction size favours institutional investors.

According to this view, the fair price will not necessarily be the same for both large and small transactions. Further, because quotes are disclosed to investors prior to trading, dissatisfaction with the price of execution is rare. If an investor suspects that the best price was not achieved, market supervisors and regulators can reconstruct positions to determine the validity of the claim, providing ex post protection to investors.

It is also worth mentioning the practice adopted by the London Stock Exchange, which voluntarily discloses analyses of the quality of execution in the "Stock Exchange Quarterly Review" (for example, in the June 1991 issue, a table depicting the breakdown by order size of trades executed at quotes better than the touch showed a potentially disturbing result: whereas almost all the retail trades execute at the touch, a significant number of large trades execute within the touch).

According to the view that favours market transparency, these data clearly illustrate the nature of the problem with poor levels of market transparency. The trades of large traders are, in effect, being subsidized by the smaller traders.

### 1.3. Conclusions

Summing up, the effective monitoring and detection of insider trading, manipulation and best execution are in principle potential substitutes for real-time reporting of secondary market information in the function of achieving fairness. Unfortunately, it is very difficult to evaluate the effectiveness of such a strategy in practice.

The analysis in section 4.2 below, which deals with the exploration of the role of asymmetric information in price discovery, casts some light on the relative merit of the two views.

## 2. Efficiency

Efficiency is closely related to the cost of transacting. The cost of transacting is a major determinant of the cost of capital for issuers (and of the return on savings for investors) and thereby provides a link between the allocative functions of the primary and secondary markets.

Generally speaking, one objective of the regulation of securities markets is to foster market efficiency and lower the cost of transacting.

There are, however, a number of different views on how regulation should strike a balance among the various components of the cost of transacting (liquidity, immediacy, price discovery, price volatility).

These issues can be analyzed as follows.

### 2.1. Immediacy and price discovery

The cost of transacting can be decomposed into two basic factors, immediacy and price discovery.

#### *a) Liquidity and immediacy*

Liquidity and immediacy relate to the ease with which securities can be traded at prices that are reasonable in relation to the underlying supply and demand conditions.

A somewhat related concept is price stability. One way to promote this is by reducing excessive short-term fluctuations in prices due to market over-reaction or manipulation.

It is widely believed that even liquid markets provide too low

a level of stabilization (i.e. stabilization is desirable but unprofitable). Hence, most exchanges provide additional mechanisms in order to have stabilized prices; a common solution is to use specialized stabilizers with certain obligations to supply unprofitable stabilization or immediacy services in exchange for some type of subsidization. There are a number of other possible mechanisms that do not involve specialized intermediaries:

- temporal consolidation of order flow;
- circuit breakers;
- stabilizing transactions by issuers required to comply with "up-tick rules" (i.e. to trade always against the market tendency).

#### b) Price discovery

Price discovery is the process by which the market finds a new equilibrium after a change in investor demand or supply.

In addition, price discovery provides the link between market microstructure and the signalling function of stock market prices. By doing so, it affects not only the welfare of those who actually trade, but also the welfare of all those who own stocks (issuers and investors) and helps them to make the best financing and investment decisions.

*Order flow information and market efficiency.* An efficient securities market is one in which prices accurately reflect the forces of supply and demand. The link between supply and demand imbalances and market efficiency is a controversial issue.

According to one argument, supply and demand will generally move in a direction consistent with establishing the equilibrium value of a security; however, temporary supply or demand swings may cause overreactions which move the price temporarily away from its equilibrium value. For this reason, a view of market efficiency may be favored in which prices reflect equilibrium values based on information about the issuers of securities, minimizing the effects of temporary imbalances between supply and demand.

A different approach focuses on price discovery and tries to

relate it to the more familiar notion of market efficiency (see also the discussion of asymmetric information in section 4.2 below).

The case where prices and quotes directly incorporate publicly announced news is compared with the case of price discovery, where the presence of news is indirectly inferred from changes in prices, quotes and volumes. This process is, however, incomplete and does not fully substitute for more direct and "hard" information, such as investor identity (e.g. a block trade initiated by a corporate insider, or by a prospective bidder, has a different impact from one of the same size initiated by a passive investor such as a mutual fund).

In other words, according to this view, price discovery is related to order flow information about the following items:

- the identity of those who placed the order;
- the size of the order;
- the aggregate potential supply and demand at any given price (provided by limit order books or by consolidated dealer quotations);
- aggregate volume and (for batch auctions) price data.

In addition, it can be argued that cross-country differences in the quality of the price discovery process are also related to the quality of corporate disclosure and to the existence and enforcement of insider trading and manipulation laws rather than to the extent of secondary market transparency.

## 2.2. Relating fairness and efficiency

There is no universal agreement on how regulation should strike a balance between the concepts of fairness and efficiency.

According to one approach, fairness and efficiency are two sides of the same coin. If a market is unfair, in the end it is also inefficient. For example, if limit order positioners are not protected, they will not enter the market and the overall liquidity

of the market will suffer (see also the discussion of passive trading in section 4.2 below).

According to a different view, the above-mentioned effect is negligible, and when immediacy and liquidity are supplied through specialized market makers, fairness, immediacy and price discovery become separate concepts.

In addition, while fairness and efficiency are related, the assumption that increases in fairness are always paralleled by equivalent increases in efficiency is not proven. Beyond a certain point, which will differ between markets, increases in some of the elements of fairness will only be achieved by reductions in one or more of the elements that make for an efficient market. Imposing unduly burdensome transparency requirements may therefore increase the costs of market participants and thereby the cost of capital to industry as a whole.

Section 4.1 below contains further analysis of these issues.

### 3. Transparency

Transparency can be defined as the degree to which information about trading (both past and prospective) is made publicly available on a real-time basis.

If attention is confined to disclosure of secondary market price information, a distinction between pre-trade and post-trade information can be made.

#### a) Pre-trade information

The posting of firm bids and offers in both quote and order-driven markets is a means of enabling investors to know, with some degree of certainty, whether and at what prices they can deal.

Information about prospective trades is transmitted through limit order and quote dissemination and transaction reports.

#### b) Post-trade information

Post-trade information concerns the price and the volume of all individual transactions actually concluded. Information about past trading is disseminated through transaction and last sale reports, regardless of the basic trading technology.

#### c) Measuring transparency: a real-time standard

The degree of transparency of a market can be measured as a deviation from a real-time disclosure standard (we implicitly refer to this standard in all the following discussions of the effect of real-time transparency unless a different definition is explicitly mentioned).

Most exchanges and regulatory systems provide for a certain

degree of deviation from this standard.

For example, most exchanges,<sup>(3)</sup> both quote-driven and order-driven, allow some degree of opacity of *quote information* for blocks (with the aim of allowing off-exchange block trading).

On the basis of the information given in the three papers and in the discussion on these topics at the January Paris meeting, it would appear that the most important difference across countries concerns the real-time disclosure standard for price and volume information.

Different exchanges have adopted different definitions of "real-time".

For example, in the United States, "real-time" means within 90 seconds from the trade.

Other markets use the term "prompt" disclosure, which varies from several minutes to a much longer time. In addition, the actual time lag also depends on how the rule is enforced. Finally, there may be some transactions that allow traders to circumvent the reporting rule to some extent.

There are countries, such as the United States, where a real-time disclosure standard applies for all transactions, markets and intermediaries; there are other countries, such as the United Kingdom, where exceptions from the standard are envisaged.

For example, the disclosure lag can be a function of:

- the size of the trade;
- the type of trade (dealer mediated rather than broker mediated);
- the type of market (dealer market rather than auction market).

Larger trades may be allowed a longer lag, while real-time disclosure for retail trades is quite common, even if the media employed vary across countries.

In addition, wholesale dealer-mediated trades may be allowed more delayed reporting than wholesale broker-mediated tra-

<sup>(3)</sup> In the rest of the paper, the words *exchange* and *market* are often used to mean "markets". In some instances, this usage may cause some confusion. In particular, it should be noted that the US has both markets that are registered exchanges and a market, NASDAQ, operated by the National Association of Securities Dealers. The above-mentioned reporting rules apply equally to exchange markets and to the NASDAQ market.

des (of course, the definition of a wholesale trade varies across countries).

One final consideration is that public regulation of secondary market transparency may provide only a minimal type of regulation. Individual exchanges may impose more stringent disclosure requirements on their members for principal and/or agency trades and quotes. In addition, exchange regulations on other related issues can differ (see e.g. section 4.4 below).

The bulk of the following discussion is restricted to the area of major disagreement, real-time price and volume information, with special emphasis on wholesale transactions.

In order to provide more detailed information, *Tables A, B, C, D, E* have been drafted; they show the domestic regulation of secondary market transparency in a number of jurisdictions, namely France, Germany, Italy, United Kingdom and United States.

To permit international comparison, all the figures have been converted into US dollars at April 1992 rate.

Table A Regulation of secondary market transparency in France

Information	Quote information	Last price and volume information
Disclosure time lag (*)	No	No
Regulator based standard? and/or	No	No
Set by national regulator? and/or		
Exchange based?	Five best bids and asks for screen based market	Yes
Difference between: Brokered trades Dealer mediated	No	No
Difference between: Retail Wholesale (**)	No	No

(\*) Starting from transaction time  
(\*\*) Define Threshold for wholesale

Table B Regulation of secondary market transparency in Germany

Information	Quote information	Last price and volume information
Disclosure time lag (*)	No	Floor IBIS Prices: No Volume (1) No, latest aggregate volume is indicated
Set by national regulator? and/or		No
Exchange based?		Yes bids/asks are visible on the screen
Difference along: Brokered trades Dealer mediated	No	No
Difference along: Retail Wholesale (**)	No	No

(\*) Starting from transaction time  
(\*\*) Define Threshold for wholesale  
(1) 100 most heavily traded stocks: Next day in the Daily Official List  
There is no concentration rule in Germany - By law prices have to be published in the Daily Official List

Table C Regulation of secondary market transparency in Italy

Information	Quote information	Last price and volume information
Disclosure time lag (*)	No	only for blocks
Regulator based standard? and/or	No	Yes
Exchange based?	best bid/best ask for screen based market	No
Difference between: Brokered trades Dealer mediated	No	No
Difference between: Retail Wholesale (**)		Yes immediate 1 hour

(\*) Starting from transaction time  
(\*\*) The minimum sizes for Blocks, expressed in US dollars (USD) are defined as follows:  
daily turnover block size  
up to 800,000 USD 200,000 USD  
from 800,000 USD to 2,400,000 USD 25% of average daily turnover over the six previous months  
more than 2,400,000 USD 600,000 USD  
Blocks can be traded off-exchange

Table D Regulation of secondary market transparency in the United Kingdom (SEAQ domestic)

Information	Quote information	Last price and volume information
Disclosure time lag (*)	No	Yes, for transactions
Set by national regulator? and/or	No	No
Exchange based?	Yes	Yes
Difference along: Brokered trades Dealer mediated	No	Yes
Difference along: Retail Wholesale (**)	No	Yes immediate 40 mins.

(\*) Starting from transaction time  
(\*\*) Define Threshold for wholesale  
Wholesale for these purposes can be defined as transactions greater than 3 times the normal market size for that security. There are eight bands of normal market sizes, which are assigned generally according to the liquidity of the particular security.

Table E Regulation of secondary market transparency in the United States

Information	Quote information	Last price and volume information <sup>(1)</sup>
Disclosure time lag (*)	Every responsible broker or dealer is required to communicate his bids, offers and sized on subject securities. There is no time lag	Last sale price and volume information for subject securities must be reported within 90 seconds of execution <sup>(2)</sup>
Set by national regulator? and/or Exchange based?	SEC firm <sup>(3)</sup> quote rule, 11Ac1-1; and exchange and association rules subject to SEC approval	SEC last sale reporting rule, Rule 11Aa3-1; and exchange and associations subject to approval by the SEC
Difference along: Brokered trades Dealer mediated	No difference	No difference difference for after-hours trading <sup>(4)</sup>
Difference along: Retail Wholesale (**)	No difference	No difference immediate

(\*) Starting from transaction time.  
(\*\*) Define Threshold for wholesale.

(1) The following types of transactions are not reported for inclusion on the consolidated last sale tape:  
a. primary distributions by an issuer or registered secondary distributions or unregistered secondary distributions effected off the exchange;  
b. transactions made in reliance on Section 4(2) of the Securities Act of 1933 (i.e. not a public offering);  
c. when the trade is agreed to be executed at a price unrelated to the current market price, e.g., gifts;  
d. odd-lot transactions;  
e. pre-exchanges acquisitions by broker-dealers;  
f. off-floor purchases pursuant to a tender offer; and  
g. the exercise of options or other rights pursuant to the terms thereof.  
(2) In accordance with the Consolidated Tape Plan, plan participants [the exchanges and the National Association of Securities Dealers ("NASD")] must establish and maintain collection and reporting procedures that assure that under "normal" conditions not less than 90% of all transactions are reported within 90 seconds. In actual experience, trades are reported in a matter of seconds. *Restatement and Amendment of the Consolidated Tape Plan*, Section VII (a), p. 27. See also, *NASD Securities Dealers Manual*, Schedule G, Section 2 of the By-Laws, CCH, 1919.  
(3) If an exchange determines that the level of trading activity or the existence of unusual market conditions is such that the exchange is incapable of collecting, processing, and making available "firm" quotations, the exchange is temporarily relieved of the responsibility to disseminate firm quotations upon giving notice to parties affected by such a determination. See 17 CFR § 240.11Ac1-1(b) (3) (i) (1991), the Commission's "Firm Quote Rule".  
(4) Exemptions have been made from the last price and volume information reporting requirements of Securities Exchange Act Rule 11Aa3-1 for both the New York Stock Exchange's ("NYSE") Crossing Sessions I and II (Securities Exchange Act Release No. 29237, May 24, 1991; 56 FR 24853, May 31, 1991) and NASDAQ International Services (Securities Exchange Act Release No. 29812, October 11, 1991; 56 FR 52082, October 17, 1991).

#### 4. How much transparency does a market need?

In this section, a number of exogenous factors that determine the level of market efficiency and fairness are isolated, and the role of transparency in achieving them is analyzed ("exogenous", is taken to mean that these factors are outside the control of the regulators).

The idea is to determine the nature of the disagreement regarding each of these particular factors, leaving the difficult issue of how to weigh the individual factors to later.

Besides market microstructure, there are a number of factors that explain the market-provided level of transparency; we list them as follows:

- the importance of asymmetric information as a motive for transacting;
- the size of the transaction (large versus small and medium-sized);
- the relationship between the wholesale market and the retail market;
- the degree of inter-exchange competition.

In the following sections the separate effects of these factors on market transparency are discussed, starting with market microstructure. An attempt to support the various arguments with empirical evidence is also made. The final section summarizes the basic results.

#### 4.1. Market microstructure

Each type of market microstructure delivers market fairness, efficiency and transparency in slightly different ways.

The most common classification of market microstructures is between "order-driven" and "quote-driven" markets. "Order-driven" markets are auction markets where customer orders generally interact directly with orders of other customers at central locations, such as exchange trading floors. In "quote-driven" markets (also referred to as dealer markets), customer orders interact with professional intermediaries that either execute them against their own inventory or match customers' orders with those of customers. Customer orders do not generally interact directly in a central location, but rather pass through an intermediary for execution.

The distinction between the two markets is not always clear and is also narrowing. A number of order-driven markets incorporate dealer-market practices, such as the exchange specialist or upstairs block trading procedures. On the other hand, some dealer markets, such as NASDAQ and the London Stock Exchange, are either experimenting with, or discussing, the introduction of a limit order book.<sup>(4)</sup>

A clear distinction can still be made, however, between a "principals" market where an intermediary can choose whether to take a principal position and a "market maker" market where there is an obligation to quote firm two-way prices during market hours.

##### 4.1.1. Is market microstructure a relevant determinant of secondary market transparency?

The answer to the question whether secondary market transparency rules should be influenced by market microstructure

<sup>(4)</sup> See "Review of Central markets in U.K. Equities. A Consultative Document from the Council of the International Stock Exchange", International Stock Exchange, May 1989; this is also known as the "Elwes Report".

will depend on whether regulators believe their judgements should be reflected in microstructure developments.

According to one view, the efficiency of a stock market is sufficiently enhanced by the presence of risk-bearing intermediaries for market transparency rules to be framed to encourage their participation.

According to a different view, market microstructure does not make a material difference for the purpose of determining the need for transparency. For example, this philosophy is reflected in the Securities Act Amendments of 1975, Section 11A, which directs the SEC to facilitate the establishment of a national market system, and which does not express a preference for a particular market microstructure.

#### 4.1.2. Market microstructure and liquidity

There are three mechanisms that provide liquidity to a market: competing market makers and specialists that operate in auction markets and limit order positioning.

##### a) Specialists versus market makers

Specialized intermediaries may supply immediacy both in quote-driven and in order-driven markets. There is no easy way to compare them.

According to one view, market makers offer better immediacy, since quotes are deemed to be more reliable on a dealer market than on an auction market, since in the former case exchange members acting as market makers undertake to provide liquidity to investors.

Those who claim that the two systems are similar reply by pointing out that it is inaccurate to state that quotes are firm only on dealer based markets. For examples in the US rule 11Ac1-1 of the Securities Act of 1934 requires the quotations of dealers on any exchange to be firm.

The additional claim is made that comparison between quotes on dealer and order-book auction markets can be made only on an ex-post basis. A spread quoted on a dealer market is not ab-



normal only when it corresponds exactly to the transaction price. Only in this case do quotes give as much information as an order book. On the other hand, if transaction prices are well within quotes, then what is posted does not reveal the full information publicly; only the market maker has full, but private, information. In that case a quote is only a "minimal commitment". Quotes may therefore not provide sufficient information and need to be supplemented by past transaction price and quantity information in order to attain transparency.

Another strand of this argument is that it is also possible to have specialized intermediaries in an auction market; hence, the specialist dealers in an auction market provide a certain level of liquidity without the fragmented order flows and banning of limit orders involved in dealer markets. It can also be argued that there is no evidence that inventory risk is larger in a market maker system than in a specialist system.

#### b) *Limit orders and liquidity*

Order-driven systems allow traders to convey limit orders in competition with broker-dealers.

It can be claimed that having limit orders provided by investors is not enough to deliver an adequate level of immediacy, and hence there is a need to subsidize specialized intermediaries.

A case for protecting limit order positioners can also be made.

Limit orders have been described as a free trading option that becomes "in-the-money" when adverse information becomes available to traders and "stale limit orders" are outstanding on the book (a similar argument applies if we consider that any market order consumes the liquidity supplied by the limit order). Unless mechanisms for the protection of limit orders are introduced, market liquidity will suffer.

One may reply to the free option argument that limit order positioners can protect themselves from the above-mentioned costs by enlarging the spread over the equilibrium price (this is in fact what market makers do, and is the ultimate reason for the existence of bid and ask spreads).

There is, however, another related, and probably more im-

portant, disadvantage of limit orders supplied by investors compared with quotes set by dealers or specialists; this is the "stale limit order" problem: when new information comes to the market, the equilibrium price should be revised, i.e. the limit order price should be bid up or down accordingly; this would, however, force limit order positioners to check market conditions continually until their order is executed (a very time-consuming task). By contrast, specialized intermediaries (both on auction markets and on dealer markets), who follow the market on a real-time basis, are better placed to revise their limit orders (or quotes) when they feel that the equilibrium price has changed.

#### 4.1.3. *Market microstructure and fairness*

A direct implication of the definition of fairness is that quote-driven markets are fragmented by design at the level of order flow interaction, whereas order-driven markets are centralized by design.

For example, on quote-driven markets, intermediaries can compete on quantity by posting different minimum lots, thereby enabling an investor to access the dealer he prefers, even if he quotes a larger spread than another dealer quoting a smaller lot (we can thus say that these markets are segmented according to minimum lot size). This is not possible on order-driven markets, where orders are usually processed according to strict price and time priority (some exchanges also offer size priority, but this never precedes price priority). In addition, in order-driven markets, provision is made either for an off-exchange wholesale market, or for free matching between small and large orders on a multilateral basis; as will be shown in section 4.3 below, there are some devices designed to promote order flow integration, and hence improve wholesale and retail market integration.

Generally speaking, it is not possible to rank quote-driven and order-driven markets in terms of fairness and efficiency on an a-priori basis.

The market maker system restricts competition from limit

orders but grants no monopoly on the observation of the order flow.

A different situation occurs with the specialist system, where more information on the order flow is directed to the exchange, while direct competition comes from other market segments, such as regional exchanges, block positioners and third market makers (one way to change this situation would be to open up the limit order book to all traders, but this would probably imply the abandonment of the specialist system and a possible deterioration in market stability).

In terms of the effect on different classes of investors, market maker systems probably favor investors who desire immediacy and are able to bargain for a price inside the quotes (it should be noted, however, that the US auction markets have developed automated execution systems that permit customers with orders of a certain size to obtain immediate execution of those orders).

On the other hand, the auction system, which offers less scope for bilateral bargaining, favors limit order positioners and those who are unable to bargain at prices inside the market maker quotes (in addition, auction markets in the United States allow for substantial negotiation between members. Trades within the spreads frequently occur as a result of these negotiations).

Different exchanges and regulators can put different weights on these objectives (see section 5 below).

#### 4.1.4. Empirical evidence

There is some empirical evidence on the liquidity provided by specialists and market makers.

In particular, some studies have compared liquidity supply in the NYSE and NASDAQ markets, the first, a market employing an auction-cum-specialist system, the latter a market maker system (transparency regulation derived from the Securities Act Amendments of 1975 is, however, the same for both exchanges).

Even in this specialized setting, results differ as different

methods for evaluating liquidity are employed. Hasbrouck and Schwartz,<sup>(5)</sup> employing the so-called "Market Efficiency Coefficient" (a method based on the ratio between intraday volatility and two-day volatility), found that auction markets (NYSE and AMEX) outperform NASDAQ; on the other hand, M. Reinganum<sup>(6)</sup> found that NASDAQ stocks command a smaller liquidity premium than stocks of similar capitalization traded on the NYSE and traced these differences to different market microstructures.

One of the few papers that deals with a cross-country institutional setting is by R. Roll,<sup>(7)</sup> who studied how different types of exchanges reacted to the 1987 crash. This paper related the post-crash drop in prices with the presence or absence of a number of institutional mechanisms that are likely to affect market liquidity in situations of stress. From our perspective, the most interesting explanatory variables are the presence or absence of a specialist system and the presence of a continuous, batch or mixed trading system. He reports that exchanges employing a specialist system (his list included NYSE, Tokyo, Paris, Frankfurt, Amsterdam) experienced a smaller drop in prices and that continuous trading systems performed worse than batch systems.

The interpretation of Roll's results, however, is made difficult due to the problems of working out a good classification of the variegated institutional settings that were studied; for example, one may object to the inclusion of Tokyo, Paris and Frankfurt among the specialist exchanges (perhaps he confused *saitori* and *Kurksmakers* with specialists); in addition, both continuous auction and market maker exchanges were included in the "continuous auction" group; finally, the classification of exchanges in terms of the role of "program trading" was flawed.

<sup>(5)</sup> Hasbrouck and Schwartz, "Liquidity and Execution Costs in Equity Markets", *Journal of Portfolio Management*, Spring 1988.

<sup>(6)</sup> M. Reinganum "Market Microstructure and Asset Pricing", *Journal of Financial Economics*, 28, 1990.

<sup>(7)</sup> R. Roll, "The International Crash of 1987", *Financial Analysts Journal*, September 1988.

As a consequence, the usefulness of this paper is extremely limited and shows how difficult it is to compare different national systems. On the other hand, there is no evidence that the simple application of the experience of individual countries is sufficient when the issue is international harmonization.

#### 4.2. Asymmetric information

As a consequence of the different architectures, price discovery in order-driven versus quote-driven markets occurs along different channels. In quote-driven markets, price discovery occurs mostly through quote revision; on the other hand, in an order-driven market, transaction prices and volumes provide important information.

When order flow is characterized by asymmetric information, price discovery becomes a critical determinant of market fairness and efficiency.

Despite this being a very subtle issue, the various papers differ more in the weight they give to the arguments than in the arguments themselves.

In a nutshell, the argument is that disclosure is a relevant issue only when asymmetric information is important. The real problem is then to measure the extent of asymmetric information; here considerable disagreement emerges.

##### a) Price discovery and asymmetric information

If a market is characterized by a high degree of asymmetric information, real-time disclosure of quotes, prices and volumes tends to improve price discovery and is preferable for the market at large.

The argument runs as follows: when there is asymmetric information, some investors are able to exploit both other investors and broker-dealers because they possess privileged knowledge. Price, quote and volume information does not enable market participants to determine when an individual order is from an insider; however, some hints of insider presence can be inferred if market participants have common access to updated information about quotes, prices and volumes.

There are a number of different views on how to measure asymmetric information in practice.

According to a first view, when most trades do not convey permanent price information, having real-time reporting on prices does not affect price discovery (by permanent price information, one can define any change in prices that is brought about by a change in fundamentals rather than by a simple transitory imbalance between supply and demand).

Some make a further and stronger claim. Under the above-mentioned conditions, if market makers are required to quote firm bids and offers and sizes, and there is also real-time publication of prices and volumes, disclosing the latter information induces excessive volatility in prices. The reason is twofold.

First, under a real-time price and trade publication regime, the cost of supplying liquidity to the market increases as market makers compensate for the increased risk to which they are exposed by widening spreads or withdrawing from the market.

Second, real-time publication of order flow information encourages investor gaming strategies, where the fact that investors are unable to determine with any degree of certainty which transactions convey permanent price information, but act as if they could, appears to result in increased price volatility.

According to a different view, the distinction between transitory and permanent prices is not relevant, from either a conceptual or a practical viewpoint, and hence the arguments that minimize the role of asymmetric information are flawed.

Firstly, it is argued that the distinction is difficult to implement in practice, since the only way to define permanent and transitory prices is on an ex-post basis (we come back to this issue when discussing the effect of passive trading strategies).

Secondly, no matter how transitory a price move may be, those who trade during that period are negatively affected. In reply to this objection, it should be noted that this affects the liquidity on the market, but not the price discovery process, since those who do not trade do not need to revise their evaluation of the stock if the price change is only temporary and would not change their financing and investment choices. In

other words, temporary shocks to market prices do not seem to alter the signaling function of market prices.

b) *Pre-trade and post-trade disclosure: substitutes or complements?*

The debate on the interaction between market microstructure and price discovery can be organized in terms of a comparison between pre-trade and post-trade disclosure. Are they substitutes or complements?

Generally speaking, one expects quotes (bids and offers) to adjust each time major news occur; this is especially likely if there are specialized intermediaries, which do not suffer from the "stale limit order" problem (see section 4.1 above).

Some argue that having real-time disclosure of prices in quote-driven markets providing real-time disclosure of quotes is redundant from the viewpoint of price discovery.

Others counter that trade information can add to price discovery: for example, knowing how much of a stock has traded in the last hour gives a good idea of market interest in that stock. For example, volume data are often used by exchanges to monitor the presence of insiders; it can be argued that investors and broker-dealers would also like to have this information.

c) *Price discovery and passive trading: winners and losers*

A much subtler issue concerns the effects on price discovery stemming from "passive trading", where some investors use the price discovery of the exchange but deal off-exchange.<sup>(8)</sup>

The key argument was put forward by Gammill and Perold.<sup>(9)</sup>

The scenario is one where the emergence of specialized wholesale markets for blocks is interpreted as another sym-

<sup>(8)</sup> See also the "Memorandum from the Director of the SEC Division of Market Regulation to the SEC Chairman, RE: Response to Letter from Chairman Markey concerning Computerized Trading Systems", July 3, 1991, pp. 8-9; this document was distributed to IOSCO Members in the September 1991 Meeting.

<sup>(9)</sup> Gammill and Perold, "The Changing Character of Stock Market Liquidity", *Journal of Portfolio Management*, Spring 1989.

ptom of the increasing popularity of so called macro investment strategies over micro investment strategies.

An investor pursuing a macro investment strategy usually decides to buy or sell groups of stocks instead of individual stocks; this strategy is widely used by portfolio managers; accordingly, it is common to decide the amount of German or French stocks to purchase by looking at the prospects of national markets as a whole, rather than by deciding which individual stocks should be selected. When these types of investment strategies are adopted, it is unlikely that much effort is invested in searching for superior information on individual stocks. In this sense, one would expect the wholesale market to supply macro price discovery, whereas the retail market would supply micro, firm-specific, price discovery (for example, the macro market would probably react more quickly to shocks affecting international macrovariables or stock market indices).

It is usually claimed that derivative markets are the best vehicles for pursuing macro-based strategies. This is not always the case, however. Derivative markets are not suitable for those macro investors who want to hold a position for a relatively long time. Using a specialized block market, where only the most liquid stocks are traded, is a possible attractive trading strategy for such investors.

It can thus be argued that the long-term effects of block markets on market liquidity and price discovery could be harmful, but no more so than the impact of derivative markets on the underlying stock markets.

Furthermore, the potential similarities between block trading and derivative trading suggest that the approach that was successfully used to analyze the impact of derivative markets on cash markets can be used to analyze the impact of wholesale block markets on retail markets.

It is possible, for example, to look at what happens in the event of market stress. Do wholesale markets stop trading when retail markets do? What happens to the wholesale market when there is a holiday on the retail market?

On purely theoretical grounds, the short-run impact of passive trading on stock market volatility should be smaller than

that of derivative markets on the underlying cash markets: arbitrage between block markets and retail markets is easier than arbitrage between derivative markets and cash markets (since the former's products are more fungible).

Another test that can be performed is to look at the direction of the price discovery process. Do prices in the retail markets always adjust before prices (or quotes) on the wholesale market? Does the opposite occur? In the latter case, the situation would be similar to that of stock index futures with respect to the underlying cash markets, where derivatives take the lead. In any case, more research on how to disentangle macro and micro price discovery is required.

Summing up, passive trading can have a negative effect on price discovery. Block trading just reflects a broader tendency toward passive trading, so that the usual channel of price discovery going from micro-based information to macro-based information is modified. The issue is an empirical one. Some hints are given in the next subsection.

#### *d) Empirical evidence on asymmetric information and passive pricing*

In principle, the differing views on asymmetric information could be resolved by looking at the empirical evidence. Franks and Schaefer<sup>(10)</sup> report some studies on temporary versus permanent effects of block market trading in the US; the results are mixed: statistically significant permanent effects were found for purchases but not for sales.

These results can be related to other studies where the identity of the block positioner is known: in these cases, both purchases and sales made by insiders or other participants in the market for corporate control seem to have more widespread permanent effects; this result is in contrast with the voluminous literature showing how mutual funds do not beat the market, so that their block trades are not likely to have a permanent impact on prices.

<sup>(10)</sup> Franks and Schaefer, "Equity Market Transparency", *Stock Exchange Quarterly*, Summer 1991.

The issue of price discovery between competing markets, one of which is "passive", could be settled by careful empirical analysis, but we know of no explicit tests in this area.

One implicit test is given in a paper by Pagano and Roell<sup>(11)</sup> who analyzed spreads on French stocks traded on SEAQ International both when the French CAC Market is open and when it is closed.

They found that spreads were much larger when the French market was closed; it can be argued that this is a price discovery effect, since a SEAQ-I market maker would react to having poorer information on order flow by quoting a larger spread (this would be consistent with some pricing on SEAQ-I being passive); on the other hand, it could simply be the result of there being less competition from the French market, so that SEAQ market makers are able to attract business even with larger spreads when their market is the only active market.

Comparing volumes would provide a way of screening the two hypotheses; under the price discovery hypothesis, a volume drop on the exchange that remains open is expected; under the monopoly hypothesis, volumes should not drop (they might even increase as more trades are captured from the closed competing market). The test should control for the time when the markets are open; the best way to do this is to consider exchange holidays on one of the two markets. The data for January 20, 1992, when the Milan market was closed by a strike, indicate that SEAQ-I market making suffered in terms of volumes on that day (in a more formal test, concerning strikes in 1990, before the reorganization of the Milan market, Pagano and Roell found that SEAQ-I traded larger volumes and at better spreads than on other days).

#### *e) Conclusions*

Summing up, considering the impact of block trading on the underlying retail market, the evidence available seems consistent with the passive pricing hypothesis, but only in a weak and in-

<sup>(11)</sup> Pagano and Roell, "Trading Systems in European Stock Exchanges: Current Performance and Policy Options", *Economic Policy*, 10, 1990.

direct form. This is due to the difficulty of identifying the identity of block traders. In addition, these results concern only the US market and it is not known how they extend to other market settings.

The results for the inter-exchange case (where more than one underlying market is involved in the block trading) are more ambiguous; they are consistent with an asymmetric price discovery process from retail to wholesale markets and this contrasts with the case of the relationship between derivative markets and retail cash markets where a strong macro price discovery effect was found.

To sum up, the evidence on the price discovery problem is still too limited to permit a definitive conclusion. The next sections focus on other indicators of market fairness and efficiency: liquidity and volatility.

### 4.3. Transaction size

#### 4.3.1. Institutions and block trading

It is widely recognized by regulators that the increased role of institutions in the securities markets has created the need to design special facilities for trading large blocks of shares.

When an investor decision to trade has a large prospective impact on market prices, the investor may prefer a trading mechanism that does not reveal his intentions.

Opaque trading mechanisms may retard or impede the leakage of information on the size of his order, and this translates into a lower cost of transacting.

Block trades generally have a large price impact. For example, the size of a block transaction can be larger than the normal quantity that is traded on a daily basis on a retail exchange. By minimizing the impact of execution on the exchange determined price, block markets, where brokers or dealers search for a suitable counterparty, may allow execution at better prices than those supplied by the retail market.

Some also argue that institutions have a series of needs: to deal in large size, to deal quickly, to minimize transaction costs,

and, when selling, to maintain the value of remaining holdings. Unless prohibited by regulation they will direct business to whichever market mechanism most effectively meets these needs. Current regulatory practices generally allow exchanges to offer block traders the option to bargain bilaterally, without consolidating their buy and sell proposals with retail orders. This fragmentation effect is automatic in dealer markets, and stems from an explicit exception to consolidation of order flow for auction markets.

Another reason why institutions might prefer to trade bilaterally in large lots is related to savings in fixed commission charges. For example, if an institution sends its order to a centralized auction market, and the order is matched with a large number of small orders, the institution will have to split the block into many trades and will end up paying a fixed commission per trade; this strategy could be more costly than agreeing to find a single counterparty and hence just one trade. In addition, it is likely that discounts for large orders apply only for bilateral transactions.

A further reason might be that large orders can be better executed with greater immediacy and with less effect on price volatility by bilateral negotiation than through risk-bearing intermediaries.

#### 4.3.2. Real-time disclosure of block trades

The evaluation of the impact of real-time disclosure of prices and trades for the block markets has given rise to a lively debate.

##### a) The case for opacity

One argument is that a certain degree of opacity is necessary to foster market liquidity on these transactions when the trades are intermediated by principals rather than brokers (according to some, this claim is acceptable only when the wholesale market is characterized by a limited presence of insiders).

The argument runs as follows:

- when a dealer purchases or sells a block as a principal, the

block trading process is broken into two or more trades. For example, if the dealer purchases the block from the investor, he will then try to find other investors, or market-makers, willing to purchase the block;

- if a real-time disclosure rule applies, the dealer will have to report all these trades separately; reporting the first transaction is likely to be particularly damaging, since the rest of the market would guess that he has a large risk position and trade against him accordingly;
- as a consequence, the subsequent unwinding of the position will be more costly than in the case of no reporting, and this will have a negative feedback on the dealer provided level of immediacy (this effect is less important on brokered transactions, since in these cases the trade is reported only when completed);
- it is claimed that the reduction in liquidity and immediacy which results from the imposition of real-time transaction publication (as in the US) of block transactions by risk-bearing market makers imposes a cost on the market as a whole which is not matched by the benefits.

#### b) *The case for transparency*

Those who dispute the above-mentioned argument counter that real-time reporting is a cost for market makers but not for the market at large; in particular, other solutions, such as auction markets with specialists, and off-exchange brokered trading provide an equivalent degree of liquidity to the community of investors.

In addition, the problem should really be addressed as a question of the appropriate allocation of costs between market participants. When dealers are able to purchase blocks of securities in a principal capacity without disclosing those transactions and to sell the securities in the retail market at a profit, the cost (equaling the profit made by the dealer) is borne by the retail investors. In an opaque market, where dealer trades are not disclosed, the customer may be, in a sense, subsidizing the dealer's block trading activities.

#### 4.3.3. *Empirical evidence*

There is some empirical evidence on these problems (see also section 4.2. e) above). The previously quoted paper by Franks and Shafer compares the roles of agency versus principal trades, and retail versus wholesale trades on NASDAQ and domestic SEAQ; real-time reporting applies only on the former (on SEAQ, there is currently a 90 minute lag for public disclosure of large trades). They interpret the data as showing that NASDAQ is basically a retail market with a large number of agency crosses; on the other hand, SEAQ quotes are larger and the share of dealer-mediated transactions is higher.

It is not clear, however, if these differences are related to the level of real-time disclosure regulation rather than to historical reasons (in the US, NASDAQ specialized at the start in listing small and medium-sized stocks).

Some additional information could be extracted by observing the market impact of relevant changes in the regulation of secondary market transparency, both on NASDAQ and on the London Stock Exchange.

The proper interpretation of this evidence is widely debated.

#### a) *The NASDAQ case*

A study on the effects of the real-time reporting rule on market making activity conducted by the NASD concludes that:

The study of the initial group of securities included in the [last sale reporting] revealed no adverse effect on the market for those stocks.... No evidence was developed or comments received to suggest that market makers' costs and profitability were being significantly affected by the advent of last sale reporting.

In addition, the Hardiman paper submitted to the IOSCO meeting of September 1991 claims that, in its experience of more than one decade with real-time reporting, NASDAQ did not suffer from the introduction of the real-time reporting rule.<sup>(12)</sup>

<sup>(12)</sup> See J. R. Hardiman, *Automation and Electronic Trading: Key Issues for Regulating in a New Era*, September, 1991.

The rule had some beneficial effects on market efficiency, investor confidence and net market liquidity.

However, according to a NASDAQ study, some market makers withdrew from block trading as a result of the introduction of the 90 second reporting rule.

*b) The domestic SEAQ case*

One account of the British experience with real-time disclosure reported that the LSE introduced publication of all trades with a delay of only five minutes at the time of Big Bang but moved to a regime where large trades were allowed publication with a 24 hour delay two years later, following an analysis that clearly showed liquidity for blocks was declining because of the exposure of market makers' positions as a result of the five minute rule.

Another source contains a different analysis of the SEAQ case. In its review of the transparency rule, the Director General of Fair Trading makes the following comment:

I have not found any evidence that on-line publication led to less liquidity or that there was a major problem of off-exchange dealing before these rules were introduced. Nor have I found that the 24 hour trade publication delay has achieved the [London Stock] Exchange's aims of reducing size premia, price and size volatility and dealing costs.<sup>(13)</sup>

Some discount the OFT analysis, citing the difficulties admitted by the OFT in isolating the effects of transparency among other influences in the market. The OFT admitted that their conclusion was based primarily on an a priori analysis of the likely effect on competition of the rule changes.

Shortly after the OFT report, the lag for volume information for large deals was brought to 90 minutes.

If this interpretation is correct, it is possible to claim that a middle ground solution, where a reasonable lag, up to a maxi-

<sup>(13)</sup> See Office of Fair Trading, *Trade Publication and Price Transparency on the International Stock Exchange*, April 1990.

mum of 120 minutes, deserves consideration as an alternative between real-time reporting and an opaque situation.

*c) Screen-based trading*

An additional prospective regulatory issue is the competition between broker-dealer mediated block trading and the 'black box' alternative, where institutions deal directly with each other and bypass not only the exchange but also broker-dealers.

The reference here is to Wunsch and other "Crossing Networks". These are batch type auctions where institutions can send limit orders for the purchase or sale of portfolios of stocks; these systems can be expected to offer low transaction costs (especially for trading stocks internationally) at the expense of immediacy of execution (orders are batched once a day). According to the paper presented by the SEC to the IOSCO meeting of September 1991,<sup>(14)</sup> the importance of these systems is still quite limited and, in addition, they still rely on exchanges for a number of supervisory and clearing and settlement services. One may infer, however, that they are already considered as a source of potential competition, at least by the most innovative exchanges.

A related issue is that of the optimal strategy for institutions. For example, in some cases, passive trading strategies on US markets are best seen as a slow-trading alternative, where the institutions unwind positions over a very long time horizon.

*d) Conclusions*

Despite the great attention devoted to the issue of the institutionalization of equity markets, it is not possible to argue that we already have fully institutionalized markets. In addition, the way institutions trade keeps on changing over time and so it is a matter of judgement what is the best way to accommodate institutional needs.

For the purposes of this work, the most important issue is

<sup>(14)</sup> See SEC, Market Division, *Automated Securities Trading: a Discussion of Selected and Critical Issues*.



how to cope with the interaction between institutional and retail markets. The answer depends on whether the issue is confined to a single exchange, or to a multiplicity of competing exchanges with a unique regulator, to a multiplicity of competing exchanges with multiple regulators. These are the topics of the next sections.

#### 4.4. Wholesale and retail markets

This section addresses the interaction between wholesale and retail markets.

##### a) *The case for protecting limit orders*

Some argue that, without complete transparency, less informed traders will be less willing to participate in the market, and this will in turn reduce liquidity in the market as a whole.

One may further elaborate on this point. In order-driven markets, if block trading occurs off the exchange, and no limit order protection is provided, the limit order book will become thinner and block positioners will have more trouble liquidating their positions; in the end, the overall liquidity of the stock may suffer. This happens because limit orders provide liquidity to the market, including the block market. Opacity will increase the supply of immediacy from dealers but will decrease the depth of the limit order book; the overall effect may be negative.

*Order-driven* exchanges often provide, and mandate, a certain degree of centralization, so that trades of different sizes can be matched and a certain critical mass obtained in volume terms. As a consequence, the distinction between wholesale and retail transactions is blurred. The result is beneficial for overall market liquidity if a large number of small limit orders are attracted in this way.

In addition, even when facilities for off-exchange block trading are permitted, measures to link the two submarkets that emerge are adopted. In order to enable limit orders to participate in block trading, rules are laid down to protect limit orders with off-exchange dealing for blocks; finally, real-time trade

and price dissemination for all transactions (blocks included) is provided in order to inform broker-dealers and limit order positioners of any revision in the market price.

One should notice, however, that certain auction exchanges are weakening these integration rules by setting up separate submarkets to cross only large orders outside the price and time priority required for smaller orders.

In *quote-driven* markets, investors can only send market orders. Hence there is no problem of limit order protection and a lesser degree of integration between the wholesale and retail market can be required (the situation obviously changes if hybrid trading technologies are envisaged, where market makers coexist with limit order books).

##### b) *The case for protecting market makers*

Others look at the interaction between wholesale and retail markets from a completely different perspective. Under this approach, maximizing the size and depth of real-time publication of quotes is essential for price discovery in all markets.

This argument can be summarized as follows:

- in quote-driven markets, real-time publication of retail sized trades, agency trades and trades in stocks subject to a control test for corporate control provides a proper balance between fairness, immediacy, volatility, price discovery and the needs of wholesale and retail investors;
- wholesale transactions may have a number of motivations but, in the absence of a mechanism for disclosure of motivation, publication may be misleading and destabilizing;
- order-driven markets have generally sought to encourage the placing of limit orders to increase liquidity. This has generally been successful for retail orders but block trades have been more effectively retained by encouraging market members to risk capital to provide liquidity.

##### c) *Conclusions*

The problem of the relationship between wholesale and retail markets is very difficult.

Either of the two competing approaches to the problem can prevail, depending on which assumptions underlying the models are correct. One view prevails if asymmetric information on the wholesale market is important and/or if most liquidity is supplied by the retail market, through limit order positioners or specialist activity. If the converse is true, the other view should prevail.

One way to reconcile these different views is to look at them as a list of the pros and cons of different exchange rules to be discussed on an equal footing by all market participants (e.g. because each category is adequately represented on the Board of the Exchange and can have its voice heard when the exchange rules are drawn up). This is the case if the problem can be restricted inside the boundary of a monopolistic exchange that has only to decide how to regulate off-trading by its members and can enforce any integration facility it chooses.

Matters become more complicated when the wholesale and retail markets are competing. This is the focus of the next section.

#### 4.5. Inter-exchange competition

The issue of real-time reporting in the case of inter-exchange competition emerges as a very controversial one.

On the one hand, it is claimed that competition between exchanges and SROS should not be constrained by regulation, on the other, that there is a role for regulation of inter-exchange competition.

##### 4.5.1. *The case for free competition*

The issues of fairness and efficiency should not be seen in terms of inter-exchange competition between wholesale and retail markets. Rather, the issue for IOSCO is whether regulators can agree on the identification and weighting of those elements of fairness, efficiency and market microstructure which will encourage the maximum participation of all investors in securities markets without dictating the type of structure that is appropriate to any particular market.

In addition, it could be argued that exchanges are well placed to balance the costs and benefits of different levels of market transparency. Accordingly, a self-regulatory approach would be superior to a regulatory approach.

The argument runs as follows.

Exchange members recognize that they will benefit if a wide dissemination of market information to the public results in increased trading volume. On the other hand, they recognize that there are costs to the provision of real-time market information reflecting an exchange's cost of doing business.

Specifically, market prices and quotations must be produced before they can be disseminated, and there are costs associated with their production. Generally speaking, exchanges are able to recoup expenses for disseminating transaction and quotation information through the collection of fees (in fact they derive a significant portion of their revenues from fees for the supply of such information).

Requiring complete transparency without adequate compensation to the exchange – not only for the dissemination of information but also for its production – can undermine the price discovery process, by lessening the incentive of the exchange to adopt more efficient trading technology. Note that in this context, “trading technology” refers to more than just the investment in hardware; it also refers to the design of the auction and the organizational structure of the market center.

The above argument gives an exchange a property right over the information produced. The question remains, however, of how these property rights can be enforced domestically and internationally. When a security is traded in multiple markets, there is a potential free-riding problem that can affect the efficiency of pricing. For example, suppose that in country A, securities markets are required to report full price, volume and quotation information and the price at which the information can be sold is contemporaneously subject to regulatory oversight as well. In this case a competing market in a different regulatory jurisdiction (or a market that relies on passive pricing in the same jurisdiction) can free-ride using the information produced by the transparent market. In

this case, regulation penalizes the regulated exchange.

#### 4.5.2. The case for regulation

A number of examples showing the desirability of minimal regulation in the area of inter-exchange competition can be given.

This approach stems from the argument that inter-exchange competition is potentially beneficial for the direct costs of transacting but may negatively affect price discovery and the supply of liquidity on the more transparent market (and possibly, though this is less likely, on the two markets taken as a whole).

In addition, it can be argued that pure wholesale markets do not exist and so it is always necessary to address their interaction with retail markets (especially if they are competing markets).

With the globalization of securities markets there are now multiple, competitive markets for most major equity securities (the emergence of separate markets for block trading and derivative trading is just one example). Where this is the case, it is argued that complete transparency is necessary to reduce the pricing inefficiencies that such market fragmentation would produce.

A number of different cases of inter-exchange competition can be considered.

##### a) *Opaque retail market competing with transparent retail market*

If order flow is fragmented between two or more markets, and only one market discloses up-to-date quote or price information, dealers on the less transparent market will revise their quotes by using information from the transparent market (this is known as "quote matching"). This is like profiting from information provided by other traders without disclosing your information when you have it.

##### b) *Opaque wholesale market competing with transparent retail market*

In this case the wholesale market has two kinds of competitive advantage.

Firstly, as in case a) above, the wholesale market may use the

retail market for price discovery (the desire to avoid execution on a centralized exchange could be only an excuse for not paying the costs while retaining the benefits provided by the retail market in terms of price discovery services). This could be the case under so-called "passive trading strategies", where prices on the block market are computed as a fixed markup over the current retail price.

Secondly, by not disclosing current price information, dealer block positioners on the wholesale market may unwind positions at a more favorable price on the retail market (even if at a given point in time the retail market may not be deep enough, the dealer has a long time to unwind the block without being noticed if reporting of block trades is not required). This is an advantage for the market maker, and his customer, and a disadvantage for other traders.

In addition, limit order positioners on the retail market will not be protected by "clear-the-book rules". In this case, limit order positioners are excluded from the rulemaking decision process given that they are not represented on the Board of the competing exchange. As a consequence, the competing exchange can free-ride on the supply of liquidity provided from the rival exchange (in the jargon of section 5.1 below, limit order positioners suffer from an "externality", and subsidize the supply of liquidity by market makers operating on the rival exchange).

The discussion in section 4.4.a) showed that if the off-exchange block market is an exchange-provided facility, block positioners may be obliged to take all available limit orders into account when they match a trade off-exchange. If the block market is a competing market, no protection for limit orders on the retail market will be offered, and as a consequence overall market liquidity may deteriorate.

##### c) *Opaque wholesale market competing with transparent wholesale and retail market*

The discussion is similar to case b) above.

In addition, in this case block positioners that belong to the retail market are at a competitive disadvantage compared with

block positioners on the wholesale market.

One reason for the disadvantage stems from application of the "clear-the-book rule" only to dealers affiliated with the retail exchange when they trade blocks off-exchange. If the underlying market is order driven, some limit order book protection is likely to apply, and this will further discourage the supply of block positioning services, since the dealer has to incur the cost of the clear-the-book rule.

Dealers in blocks on the more transparent market will incur additional costs, since everybody, including those who deal on the less transparent market, will know that the former have to unwind their position, and hence will react accordingly (this is an example of the so-called "sitting duck" problem).

A similar analysis also applies to the case where an opaque wholesale dealer market competes with a transparent retail dealer market.

#### *d) Who gains and who loses from opaqueness*

Using market opaqueness to gain competitive advantage at the expense of transparent competitors may have a negative impact on overall market efficiency and integrity.

If an opaque market competes with a transparent market, liquidity and price discovery in the second market will suffer.

In addition, the overall level of liquidity may suffer; in this case, inter-exchange cooperation is particularly desirable.

Different structures and rules may have some effects in the case of inter-exchange competition. As a practical matter, the effects can be seen as larger in the case of wholesale versus retail markets competition. This can be seen as follows.

Quote matching at the retail versus retail level (see case *a*) above) provides only a small competitive advantage for the less transparent exchange and does not have a major effect on market transparency.

The most common case is when the more transparent market is also the dominant market in terms of price discovery, price liquidity and ease of access in order routing.

Another possibility is when a transparent retail market starts to operate in parallel with a more opaque retail market.

This is indeed the case of Germany, where a number of blue chips are traded on two types of retail market. In particular, the new IBIS computerized continuous auction system attracted volumes from the less transparent floor market. Whereas the floor market discloses only prices on a real-time basis, IBIS discloses both prices and total volumes. As a consequence, the IBIS system is more transparent in terms of quote information.

Generally speaking, individual investors will gain by accessing the more liquid market even if the smaller market has an advantage in quote matching capability (e.g. they may obtain execution inside the quotes, since the market is more liquid).

As a consequence, it is very unlikely that the market that provides quote matching will be able to gain much market share over its bigger competitor. All the experience concerning Inter-market Trading System and the "Rule 19c.3 market" of the Cincinnati Stock Exchange (a "black box" market engendered by the possibility of off-exchange trading in US stocks listed after 1979), and other bilateral agreements for order flow consolidation, shows that exchanges having enough critical mass are not going to lose market share, despite other differences in microstructure.

Competition in terms of relative transparency can be more harmful in the wholesale versus retail competition, since in this case the retail market that provides for better price discovery may keep on losing market share to the more opaque market.

A vicious circle may emerge where in the end the overall price discovery process is depleted. In addition, it can be argued that the likely presence of increasing returns in the provision of trading services may end up in a suboptimal framework if exchanges do not cooperate.

When a wholesale exchange competes with a more transparent retail exchange, it suffices for the wholesale exchange to attract the block trades that gravitate outside the retail exchange. These block trades have only a weak link, consisting of the "clear-the-book" rules and "real-time reporting" rules, with the retail exchange.

Both rules have a public good nature, and hence each individual trader may prefer to evade them.

One qualification to this argument is that it is assumed that the two markets can be unambiguously ranked in terms of ex ante and ex post transparency. If the wholesale market is more transparent in ex ante terms and the retail market is more transparent in ex post terms the analysis is much more complicated.

Having less transparency can be desirable for the block traders as a group, especially if the retail market can be used to unload the block trades. The latter possibility even allows the competing wholesale market to switch to a riskier strategy of own account positioning rather than acting as a broker in order to attract more order flow.

#### e) *Empirical evidence*

The empirical evidence on the issues that are being debated in this section is quite limited.

Firstly, the analysis of the previous section shows that the extent of the liquidity supplied by limit orders is an important element in assessing the impact of competition from an opaque wholesale market.

One of the few pieces of evidence is again the previously cited paper by Pagano and Roell,<sup>(15)</sup> which shows that the effective depth of the Paris CAC limit order book is comparable at least with the size of market maker quotes for these very stocks on SEAQ-I. It should be noted, however, that the real depth of the book was not disclosed by CAC, and so investors were not completely aware of the relative costs of transacting on the two markets (the methodology used by Pagano and Roell considers the average spread that an investor would pay when transacting by splitting a medium-sized order on the CAC book and compares it with the spread available on the same type of order for the same stock executed on SEAQ-I; however, their analysis does not take full account of the different commission costs that apply in the two cases: to a certain extent, commission costs on CAC are proportional to the number of contracts rather than the size of the deal).

(15) See note 11

The depth of limit order books varies considerably across auction exchanges; Cohen et al.<sup>(16)</sup> reports that the Tokyo book is much tighter than the NYSE book for a comparable stock.

A different problem concerns the importance of limit order protection. As a practical matter, limit orders are left unprotected only when large transactions take place at prices that are very far away from the current quotes.

S. Williams<sup>(17)</sup> reports that the AMEX made a survey on this problem in 1982, and found that, despite the lack of limit order protection, only a very small number of limit orders were left unexecuted in these instances. (One must however recall that AMEX attracted a relatively small share of large capitalization stocks, where block trading is more important).

A more direct test of the importance of unloading of inventory from the less transparent to the more transparent exchange could be made by looking at the change in volatility in the transparent market following an increase in the market share of the opaque market. Such a test has been made for the US market by Cohen and Conroy, who measured the effects of the introduction of Rule 19c.3, which allowed off-exchange trading for all stocks listed after 1979.<sup>(18)</sup> They found an increase in volatility and a decrease in the spread for the "retail" market (it should be noted, however, that these trades were still covered by the real-time reporting rule for prices and trades).

Some information on "quote matching" comes from the analysis of Intermarket Trading System. At the time of its introduction, in 1978, ITS was the only system giving access to real-time information on the best quotes on the various US regional exchanges; the system did not require time priority, since there was no consolidation of order flow; the result was "quote matching"; dealers on the regional exchanges were able to revise the price using the quotations on the largest exchanges (the NYSE and the AMEX) without being forced to channel ord-

(16) Cohen et al., *The Microstructure of Securities Markets*, Englewood Cliffs, 1986, p.20.

(17) S. Williams, "The Evolving National Market System", in Amihud et al. (ed.), *Market Making and the Changing Structure of the Securities Industry*, Lexington 1985.

(18) Cohen and Conroy, "An Empirical Study of the Effects of Rule 19c-3", *Journal of Law and Economics*, April 1990.

er flow to that competing market. According to a paper by J. Davis, who was at the SEC at the time,<sup>(19)</sup> the improvement in execution resulting from ITS mainly benefited dealers on the regional exchanges at the expense of dealers on the NYSE: «Some regional specialists may have tighter spreads as a result of their direct access to the NYSE for laying off positions they have accumulated».

The most important effect was that of subsidizing the success of small order execution systems devised by the regional exchanges.

However, according to an empirical study by the SEC, ITS did not induce tighter spreads on the NYSE itself, and hence did not benefit the bulk of investors, who transacted on the NYSE or AMEX.

Notice that, nowadays, quote matching of the type allowed on ITS in the late seventies is a normal byproduct of real-time quote dissemination by information vendors.

#### f) Conclusions

From the foregoing analysis it can be seen that, according to one approach, inter-exchange competition is at the heart of the debate of this IOSCO Working Party Group. In particular, the analysis of this section makes up the core of the rationale for a number of proposals in favour of international harmonization of secondary market transparency (see section 5 below).

Others do not share this view. According to this different approach, the relationship between market transparency and inter-exchange competition should not be a IOSCO concern, independently of the other factors that influence competition.

Before pursuing this issue, it is worth devoting some space to a review of the various domestic approaches to regulation of secondary market transparency.

<sup>(19)</sup> J. Davis, "The Intermarket Trading System and the Cincinnati Experiment", in Amihud et al. (ed.), *op. cit.*

## 4.6. Domestic regulation of secondary market transparency

### 4.6.1. Policy trade-offs

It can be argued that there are trade-offs between a number of desirable regulatory objectives: fairness, price discovery, immediacy and liquidity, market stability and free competition between markets. In particular, by manipulating the level of market transparency (which is the only regulatory instrument that is explicitly considered in this paper), the ranking of the different objectives can change.

These trade-offs can be grouped as follows:

#### a) *Free competition among exchanges versus price discovery and fairness*

The task of improving price discovery requires in principle that all orders be matched in a centralized way rather than in multiple, fragmented (but competing) markets. However, this is gained only at the risk of higher fixed commissions per trade, since the exchange can now behave as a monopolist when selling transaction services.

A particular case of the above-mentioned trade-off concerns the relation between immediacy, which usually requires a certain amount of fragmentation, and price discovery.

#### b) *Price discovery versus price stability*

Other trade-offs may arise in the case of major market breaks (this is the topic of another section of this Working Party and is referred to here only as an example). In this respect, the task of reducing market volatility may require suspension of trading, even if this prevents the free interaction of supply and demand (i.e. price discovery).

### 4.6.2. Transparency

Whereas all national regulators would probably agree on the desirability of each objective taken in isolation, in cases of con-

flicting objectives relative emphasis will be put on one principle rather than on the other.

*a) The case for transparency*

For example, some jurisdictions give priority to disclosure as a regulatory instrument over other instruments.

According to this regulatory approach, a number of benefits of real-time disclosure of secondary market information could be identified. In this view, an evaluation of the potential costs of real-time disclosure only applies to quote information pertaining to the block market; in this sense, the real-time transparency standard should apply only to price and volume information.

In addition, the general principle is stated that free competition must always follow market efficiency and fairness.

*b) The case against transparency*

Other jurisdictions identify the cost for retail investors of real-time disclosure of block trades and go on to ask whether the claimed benefits to retail investors are in fact illusory. They observe that where retail investors free-ride on institutional transactions in the belief that the latter reflect a reassessment by "insiders" of a company's prospects, and this belief is mistaken, the volatility of share prices may increase to the detriment of retail investors themselves.

This is the case if regulators attempt to limit volatility by the introduction of circuit breakers, which close the market to retail investors but not to institutions who have access to alternative dealing mechanisms.

It can thus be argued that, by encouraging reduced volatility and providing immediacy of execution, non-publication of block transactions in a quote-driven market may promote both greater confidence in investors that quote prices do generally reflect fundamental values (i.e. are fair) and have a less random element at any given time due to temporary shocks between supply and demand (i.e. are efficient).

Summing up, it is not easy to determine the correct weighting of the various instruments when all the above-mentioned

factors (market microstructure, asymmetric information, retail versus wholesale trades, inter-exchange competition) interact together.

In the end, the final mix will result from a policy decision, taken at the level of each individual country, on how to weigh the conflicting interests of the different market players (small investors, institutions, intermediaries and exchanges). In some cases, where regulators help justify the erection of non-tariff barriers to the trade of financial services, the emergence of protectionist interests may further complicate the picture.

The next section considers whether a further layer of international regulation is worth debating.

## 5. Discussion of possible proposals for international regulation of secondary market transparency

This final chapter is divided into two parts.

In the first part, a comparison can be made among different tentative proposals for international harmonization of market transparency.

In the second part, a number of alternative instruments that could substitute for or complement market transparency are put forward.

### 5.1. The case for harmonizing secondary market transparency for internationally traded stocks

#### *a) Introduction*

This section examines the rationale for international regulation of secondary market transparency.

The key area where the possibility of cooperative regulation could be considered concerns inter-exchange competition.

Recent experience in connection with the trend toward internationalization shows why this is a relevant problem.

In a sense, what is happening now on an international basis has some interesting parallels with the process of market fragmentation that occurred in the US market following the deregulation of commissions back in 1975.

The growth in automation and institutionalization has increased the level of fragmentation in most stock markets. More stocks are traded internationally, especially on the block markets that serve the major institutions of the world. Fierce competition for the order flow of blue chips, which have active



blocks across markets. This externality affects the level of liquidity and volatility in the injured market. If dealers that operate on opaque markets unwind their positions on the transparent market, they are able to lower the cost of market making without compensating those who supply liquidity on the transparent market.

- Quote matching and passive pricing. The opaque market may use price and trade information from the retail market to update its quotes. In this case, the more transparent market ends up subsidizing the more opaque market in the supply of price discovery services. In addition, this externality can negatively affect overall price discovery.

In addition, the discussion of section 4.5 shows that, in the case of *inter-exchange* competition, less transparent markets seem to have a competitive advantage over more transparent markets. This weapon is more likely to be effective if the market that uses it is a wholesale market and if the underlying market is an auction market.

Finally, inter-exchange competition casts some doubt on the role of individual exchange-based monitoring as a substitute for transparency. When one market can opt for regulatory surveillance for its own investors but also provides a safe harbour for secret trades in another market's securities, the surveillance alternative to transparency does not have the same positive effect as it is claimed to have for a single domestic market (a possible solution is provided, however, by inter-exchange surveillance agreements).

How important are these free riding effects from the empirical standpoint?

The evidence on these issues discussed in section 4 above is not conclusive.

On balance, the sitting duck problem seems more important than the quote matching problem.

However, more tests of the effect of international fragmentation of order flow on the spread and on the volatility of the underlying market could be useful.

secondary markets, can be observed. The most important financial centers are developing specialized wholesale markets; domestic exchanges, however, may not want to give up that part of their order flow and react by modernizing their trading structures and eventually by asking for less regulation.

b) *The case for regulation: objectives*

There are a number of reasons for regulating a certain type of activity.

International regulation is mainly devoted to "harmonization", i.e. to standardizing domestic regulations (two well-known examples in the IOSCO area are harmonization of capital requirements for securities firms and harmonization of rules of conduct).

Harmonization can be expected to be required only when the regulatory problem is particularly acute. The reason is that international harmonization has its costs, since the sovereignty of the individual exchanges and regulators is constrained on the harmonized issues. As a consequence, it can be argued that domestic regulators should be free to choose their mix of regulatory objectives unless their action has a potentially harmful effect on other regulatory regimes.

The most compelling example of a harmful effect is that of externalities, i.e. actions by agent A that have pecuniary effects on agent B, who is not compensated for the damage he suffers; a classic example is pollution created by industrial production (in other words, party A is a "free rider").

For example, in the area of harmonization of capital adequacy, one justification for harmonization is that both domestic and foreign securities firms should be regulated in the same way, so that the risk of an international transmission of episodes of collapse of multinational securities firms is reduced.

The discussion that follows is confined to a number of free riding effects that may require the harmonization of rules regarding secondary market transparency. The analysis of inter-exchange competition contained in section 4.4 above shows that there are at least two types of potential externalities:

- A "sitting duck" effect resulting from the unwinding of

The argument that these externalities may require intervention should consider that international competition also has potentially beneficial effects for the more transparent markets. For example, international competition has accelerated the process of modernization on the smaller and less innovative exchanges.

Two caveats are worth making, however.

Firstly, the major gainers from international competition (and, more generally, from the deregulation of stock exchanges) have been the institutions; it is not known how much this gain has come from genuine technical progress and the removal of monopolistic barriers, rather than as a pure redistribution of wealth at the expense of small investors.

Secondly, the available evidence shows that the opportunities for the less transparent market to exploit the transparent market increase with the latter's efficiency.

As a consequence, the problem of the externalities between exchanges, whatever they are, is becoming more severe as all exchanges are modernizing.

### c) *Who should be in charge of the regulation?*

In the event that the international regulation route is pursued, there is also the problem of who should regulate these matters. In this respect, it is particularly important to compare the historical experience of domestic inter-exchange harmonization with the problem at hand.

A brief review of these experiences follows:

The US domestic equity markets environment is already an environment of competing exchanges. The Securities Act Amendments of 1975 is probably the most important piece of legislation in this context; the Act only sets out general guidelines, leaving the manner of implementation to the SEC.

The Real-Time Reporting Rule was only one of the consequences of the Securities Act Amendments; other measures include the ITS (Intermarket Trading System), a mechanism for routing orders received on one market to another market that is displaying a superior quote; the CQS (Consolidated Quote System) a device for the integration of quote information; and

SEC Rule 19c.3, which allowed off-exchange trading for all stocks listed after 1979 in the US.

The experience of the Securities Act Amendments is unparalleled in other countries. Some individual countries have introduced measures aimed at the integration of regional exchanges (e.g. Italy and Germany). All efforts to integrate EEC exchanges, under the "Euroquote Project" have to date failed. A number of distinctions between the US scenario and the international scenario can be made, however.

Firstly, there are at least two international scenarios.

One scenario concerns competition for order flow across different time zones.

This is the basic, America, versus EEC, versus Japan scenario. In this case, for each time zone there is always a leading market, whereas the competing market can adopt some off-hour trading mechanism.

Competition is particularly strong for domestic stocks traded in another time-zone, where a foreign exchange is the leader in terms of transaction frequency (e.g. US stocks traded in England at 11.00 a.m. London time).

Another scenario concerns competition between regional exchanges in the same time zone. A notable example is the EEC, where an international exchange has developed in London and has won a large share of block trading order flows in other European blue chips. The growth in the market share of this market is unparalleled in the US case, at least if the focus is restricted to the trading of cash settled securities.

Secondly, in the US market, the bulk of competition for order flow between wholesale and retail has concerned the emergence of stock index futures rather than the emergence of organized wholesale markets for blocks.

The block market remained mainly an unorganized, off-exchange market. However, in a number of US exchanges, block trading is successfully integrated with the retail market through transparency and the clear-the-book rule.

In addition, block trading in derivative markets has become an important issue only very recently.

Finally, at the international level, there is also the issue of competition between different regulatory regimes. Some of the points of disagreement that emerged in this paper are good examples of this situation.

The possible differences between the various scenarios suggest special care is needed when evaluating the pros and cons of international harmonization. Even if there is no a-priori presumption that a no-action policy is the best one, automatic transposition of any domestic regulatory regime is likely to be ill-suited to the job.

Summing up, the issue of real-time reporting for international equity markets comes from the interaction of two types of competition:

- competing exchanges under different regulators;
- competing retail versus wholesale markets.

The discussion contained in section 4 shows that in the case of a monopolistic exchange, or in the case of a single regulator (especially when the different exchanges specialize in different stocks), there is an institutional setting in which the interested parties are able to bargain in order to agree on a common solution.

In an international environment, there is no arena where these potential free riding effects can be bargained between the interested parties and where the resulting agreement can be enforced.

In this case, the various domestic approaches to the free riding problem would only be valid as a possible starting point, since extra-territorial problems emerge when the authorities that set the level of disclosure are not necessarily cooperating.

As a consequence, IOSCO is the only likely bargaining arena in which a cooperative agreement could be reached balancing the different interests.

## 5.2. Discussion of proposals on secondary market transparency put forward by IOSCO members

This section is dedicated to the comparison of the various proposals that have already been made in the three papers or

in the September 1991 and January 1992 meetings of the Working Party.

### a) *The lead regulator approach*

If an agreement cannot be reached on minimum transparency standards, it should at least be agreed that when high volumes of fungible securities are traded outside their domestic market (i.e. the market of the issuer's incorporation), transparency standards consistent with those of the domestic market should be implemented in those foreign markets, so that the proper functioning of the domestic market is not disrupted.

### b) *The real-time transparency standard*

A real-time standard for all last price and trade information was proposed in the IOSCO Annual Conference held in Washington, in September 1991 by the NASD. This proposal is aimed at extending the US standard to all other markets.

### c) *A weaker version of the real-time standard*

As the discussion contained in section 4.2 and 4.3 above shows, the cost of introducing a real-time disclosure standard for retail markets is not high.

The biggest problem is how to coordinate rules on how to disclose block trading transactions.

One possible rule is to agree on immediate disclosure only for agency transactions (see e.g. the previously cited paper by Franks and Schaefer). Such a rule should be feasible, since brokered trades would not be harmed by immediate reporting. There is however disagreement on the scope of this rule.

On the one hand, it was acknowledged that where a dealer has acted as agent in matching investor block orders the case for immediate publication for such completed trades is strong, as well as for all types of retail market trades.

Others do not consider this very limited rule as the most appropriate response to the problem. In addition, it can be noted that there may be a problem in determining what is an "agency trade"; often, dealers effect trades for their account through brokers.

A more ambitious proposal would be to search for a maximum time lag for price and quote reporting for dealer market transactions as well. For example, the 90-minute-delay employed by the domestic SEAQ could be a reasonable starting point for a level playing field for inter-exchange competition.

Such a rule would bring wholesale markets more into line with retail markets and foster the overall level of market liquidity.

It is worth exploring the working of the rule a bit further. To start with, it can be argued that in order to have equality of treatment between brokered and dealer-mediated transactions, the latter would be disclosed only when the dealer has been able to get rid of all the block he purchased. In practice, it is not possible to enforce this rule, and one would proxy it with a maximum lag from the time of the original purchase or sale (in this sense, the reporting lag can be seen as corresponding to the average time that is required to accommodate the block for the dealer).

However, the "optimal lag" might be less than the average time for unwinding all the positions. This would be justified by a view that the dealer on the opaque market has to bear some risk from the block transaction when he unwinds his inventory on a competing market (this is like a tax on unwinding transactions).

It is obvious that calculating the optimal lag is difficult and requires further analysis (see however the discussion at the end of section 4.3.2 above). However, this might be a better compromise than the "do nothing alternative", as discussed below.

#### *d) Do nothing*

In this case one would start from the current situation of different levels of domestic regulations, where the level playing field is represented by real-time display of quotes, and eventually trades and prices, from different markets (it should also be noted that the size at which intermediaries are ready to trade provides important information).

Information vendors usually supply this minimal level of market transparency on a single medium (this is a big improvement

in itself with respect to the pre-automation era).

Accepting the "do nothing approach" at the IOSCO level would not necessarily imply that things will stay as they are.

Firstly, there is likely to be a process of levelling down to an opacity standard as the currently transparent exchanges lobby for removal of stricter transparency rules.

Secondly, there could be the opposite risk of some countries restricting access to the opaque market by domestic investors, including institutional investors (i.e. there would be new regulatory barriers to international capital movements). If this strategy were effective, the implied costs in terms of international diversification for investors could be very high.

#### *e) Implementation issues*

What type of transactions should be eligible for a real-time (or delayed) reporting rule?

The harmonization rule should be specifically targeted only to stocks that are traded internationally. One possibility is to refer to internationally cross-listed stocks only. This concept is too restrictive, however (for example, SEAQ-I does not entail a separate listing procedure, but only requires that a stock is "eligible"; this requirement often boils down to being already listed in the Country of origin).

An implementable definition of what is an internationally traded stock would thus be required if a rule of this type were imposed.

Another possibility is to use the size of the transaction as the basic reference variable. For example, a common secondary market disclosure rule could be formulated for all retail transactions and another for wholesale transactions. In addition, in the case of wholesale transactions, different rules could be introduced for dealer-mediated rather than broker-mediated transactions.

The main difference between a standard based only on international trading rather than on the size of the transaction stems from the rationale for the harmonization rule.

Consider the case of block trades (or dealer-mediated trades) for a stock that is traded only domestically: the discussion of

sections 4.2 and 4.3 suggests that the potential benefits from real-time reporting for all transactions are greater for thinly traded stocks than for heavily traded stocks: in thin markets, asymmetric information can be expected to be an important issue.

However, the imposition of real-time reporting for block trades in thin stocks needs separate treatment: the block market for thin stocks is probably characterized by wide asymmetric information (since passive trading will probably be very infrequent for such stocks, given the less wide spread presence of institutions). As a consequence, the case for real-time disclosure of all trades, blocks included, is strong.

Despite the results of the cost-benefit approach, it seems that there is no strong basis for an international cooperation rule when there is no international competition for a stock.

In this sense, applying the standard only to internationally traded stocks could involve less interference with national sovereignty.

### 5.3. Is market transparency the only possible instrument for promoting fairness and efficiency?

One very important final question is whether enhanced transparency is the only relevant policy response for the enhancement of market fairness and efficiency.

It can also be asked whether there are any inter-exchange coordination devices which could complement or substitute for secondary market transparency. If such devices were found to successfully substitute for market transparency, after the relative costs and benefits of the two alternatives had been considered, it would be worth including them as additional proposals for action (see section 5.2 above).

A number of alternative instruments for the promotion of market efficiency and fairness can be identified.

Firstly, there is the possibility of order flow integration on a cross exchange basis.

In addition, the IOSCO Working Party on Regulation of Secondary Markets is explicitly dealing with two related issues: screen-based trading and circuit breakers.

Finally, some claim that real-time disclosure of price and volume information helps to discipline inter-exchange front running. A possible alternative is given, however, by inter-exchange cooperation in the area of market supervision.

#### a) *Order flow integration*

Introduction of rules mandating consolidation of order flow and/or real-time price, volume and quote dissemination makes a benchmark for common reference (a practical example is the US National Market Act of 1975).

These rules can be in the interest of individual exchanges, which often mandate and enforce them.

For example, protection of limit orders hanging on the book while a block trade is being negotiated would require a sort of "clear-the-book" rule. Even if real-time reporting were in force, the limit order supplier is unlikely to monitor the market in order to update his order.

More generally, the only way to ensure full fairness is to enforce time priority for all limit orders for a given stock. Time priority requires, however, full consolidation of all quotes and limit orders and is not consistent with a fragmented market.

The real gainers from a real-time reporting rule are those who are posting their limit orders while the block is traded and those who are able to monitor the market on a real-time basis; stock market intermediaries and arbitrageurs that link the various markets are the most likely candidates in the latter category. Insofar as these intermediaries provide liquidity services and price discovery services on their exchange, this has a positive feedback for all other market participants.

An important example of "liquidity services" occurs when these operators are actually absorbing the eventual unload of block orders from the competing market (exchange based specialists are a very important candidate here). An important example of "price discovery services" occurs in the case when the block trade brings permanent revisions in the equilibrium price of the stock.

Enforcing rules of this type in an international environment, where exchanges compete, is likely to be very difficult and self

defeating. Different markets may select different degrees of order flow consolidation, and some markets may emerge with a desire not to share order flow information.

More generally, if the exchanges consider themselves as competitors, rather than as suppliers of complementary goods, it is very unlikely that they will agree to integrate order flow, since this can be enforced only if a certain degree of cooperation emerges.

Given that an agreement on full consolidation is very unlikely, a less ambitious, but more feasible task would be to ask for a minimum level of price, sales and quotations disclosure harmonization.

#### b) *Screen-based trading*

The definition of what is a Screen-Based Trading system and how it is regulated influences which markets stand to benefit from a nontransparent trading rule.

A large number of these systems operate under a US regulation that imposes a real-time disclosure rule; in addition, they attract negligible volumes and so they might still be considered a negligible issue.<sup>(20)</sup>

However, since most screen-based trading systems serve institutions, they may opt for a less transparent rule when operating outside the US. Should IOSCO opt for some minimal harmonization rule for exchanges, it would be essential for these mechanisms to be subjected to the same rule.

#### c) *Circuit-breaker mechanisms*

Circuit-breaker mechanisms are at first glance diametrically opposed to the real-time reporting rule: when they are triggered, the real-time reporting rule is voided, since exchange trading is suspended.

In the debate that followed the 1987 market break, some commentators argued that the case for trading suspension should not be confused with the case for suspending order routing and

recontracting as well. One possibility for reconciling these two goals is to resort to a batch auction system, where orders can accumulate, and form indicative prices until trading reopens.

In this respect, sharing this type of quote information between competing exchanges, for example on an aggregate basis (total volumes, mismatch between demand and supply, and hypothetical equilibrium price), could facilitate price discovery and hence help to dampen market volatility in cases of market stress.

A careful analysis of the pros and cons of real-time reporting on order flow in the case of market breaks (eventually on an aggregate basis, e.g. for the opening transactions), and for coordination of these reporting devices when the stocks are traded cross-country could be an issue to debate further in this IOSCO Working Party.

#### d) *Inter-exchange front running*

One important problem concerns the regulation of inter-exchange "front running". Front running emerges when securities firms operate in a dual capacity and accommodate own account trading ahead of agency trading. When incoming agency orders are large, broker-dealers have an informational advantage over the rest of the market, and may exploit this information through own account speculation before executing the agency order.

Exchange rules prohibit front-running. When there is market fragmentation, and exchanges for fungible products compete, broker-dealers that operate in both markets may exploit their customers in a similar manner, by placing the agency order in one market after placing their own account order in the other market.

Policing this kind of transaction requires inter-exchange cooperation. Some argue that real-time reporting of prices and volumes helps to solve the problem, although others do not perceive any benefit unless the broker is publicly identified with particular trades.

However, if the real-time reporting standard is not accepted, IOSCO may need to consider the possibility of promoting an

<sup>(20)</sup> See SEC, Market Division, *Automated Securities Trading: a Discussion of Selected and Critical Issues*, Paper presented at the 1991 IOSCO Annual Conference.

inter-exchange agreement to monitor and enforce a rule banning inter-exchange front running.

A somewhat related problem is how to regulate arbitrage transactions between different market segments. Arbitrageurs often have an informational advantage, either because they have some specific information on order flow (especially from the wholesale market) or because they have invested in equipment that allows them to police the discrepancies between the various markets in a better way than other investors (by doing so, they exploit the existence of real-time reporting rules).

This informational advantage can be a source of unfairness; arbitrageurs will be able to make profits at the expense of other traders. On the other hand, provided arbitrageurs do not manipulate or destabilize markets, their activity is beneficial for price discovery for the market at large. Again, assessing the pros and cons of this issue deserves further attention.

An example of an inter-exchange coordination agreement is given by the "Intermarket Surveillance Group". The ISG is composed of representatives from all the US securities and option exchanges and by the CFTC and the SEC; it was formed in the early eighties in order to share regulatory information relevant to intermarket and other trading violations.

Following discussions at the ISG and negotiations between the exchanges during the past two years the CME and the NYSE, in March 1990, and the CBT and the NYSE, in December 1990, have separately established information sharing agreements that provide for the daily exchange of certain agreed-upon surveillance information believed by each to be relevant to investigating intermarket abuses. This information includes data from the NYSE on its program trades and data from the CME and CBT on large stock index futures transactions. Using data from the NYSE, the CME generates a daily computer report which analyzes trading in the S&P 500 and NYSE program trades for possible intermarket front running. The exchanges have integrated these reports into their surveillance programs.

In principle, it can be argued that a similar system could be envisaged for monitoring intermarket abuses on an international basis.

The fixed costs of this system are likely to be much higher than the costs of real-time disclosure for regulators and exchanges. One additional issue is that this alternative is more viable if intermarket flows between exchanges are symmetrical; otherwise the allocation of costs and benefits will be more difficult to agree. However, the exchanges that take part in the agreement could prefer this alternative if they place a high value on market opaqueness.

Finally, most of these links should be bilateral; a link would be worthwhile only if intermarket trades are relatively large.

### Further analysis

The issue of secondary market transparency has already attracted considerable attention.

However, if further work is deemed necessary, it could be useful to collect more information on the following areas:

- a) recent changes in the domestic regulation of secondary market transparency and the main reasons for the change;
- b) how much time is required on average for dealers to unload their positions stemming from principal trades in the block market;
- c) extent of unwinding transactions from competing markets;
- d) impact of listing on opaque market on volatility and spread in the underlying retail market;
- e) analysis of international transmission of volatility between wholesale and retail markets (in order to be relevant for our purposes, these analyses should isolate the effect of market microstructure on price discovery);
- f) comparisons of arbitrage activity in derivative versus cash markets with arbitraging activity between stock markets with different degree of opaqueness.