

# WESTERN HEMISPHERE PAYMENTS AND SECURITIES CLEARANCE AND SETTLEMENT INITIATIVE

## INICIATIVA DE COMPENSACIÓN Y LIQUIDACIÓN DE PAGOS Y VALORES DEL HEMISFERIO OCCIDENTAL



### WORKING PAPER 2:

## METHODOLOGY FOR THE ASSESSMENT OF SECURITIES CLEARANCE AND SETTLEMENT SYSTEMS

*This working paper describes the methodology used for the assessment of the securities clearance and settlement systems in the context of the Western Hemisphere Payments and Securities Clearance and Settlement Initiative (WHI). The World Bank in partnership with the Centro de Estudios Monetarios Latinoamericanos (CEMLA) leads this initiative. The objective of the Initiative is to describe and assess the payments systems of the Western Hemisphere with a view to identifying possible improvement measures in their safety, efficiency and integrity. To carry out this mandate the World Bank has sponsored an International Advisory Council (IAC) comprised of several institutions with high expertise in payments and securities clearance and settlement systems<sup>1</sup>. This document was prepared by Mario Guadamillas (World Bank, Financial Economist) and has benefited from comments by Massimo Cirasino (World Bank, Financial Economist), Robert Keppler (World Bank, Adviser) and Fernando Montes-Negret (World Bank, Finance Sector Manager). This working paper extends the work of the working paper 1 “Matrix for the Assessment and Recommendations of the Securities Clearance and Settlement Systems”<sup>2</sup> (available in [www.ipho-whpi.org](http://www.ipho-whpi.org)) in order to include the 18 recommendations of the CPSS/IOSCO joint Task Force document: “Recommendations for Securities Settlement Systems”, released in draft version in January 2001. New changes to this tool as a result of comments received or new experienced gained from country assessments under the Initiative will be included.*

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<sup>1</sup> World Bank, CEMLA, Bank for International Settlements, Bank of Italy, Bank of Portugal, Bank of Spain, Council of Securities Regulators of the Americas (COSRA), European Central Bank, Federal Reserve Board, Federal Reserve Bank of New York, Inter-American Development Bank, International Monetary Fund, International Organization of Securities Regulators (IOSCO), Securities Commission of Spain, U.S. Securities Commission (SEC).

<sup>2</sup> A detailed explanation of the methodology summarized in the matrix can be found in Guadamillas, M. and Keppler, R., *Securities Clearance and Settlement Systems: A Guide to Best Practices*, Policy Research Working Paper 2581, The World Bank, April 2001.

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## 1. INTRODUCTION

The *Western Hemisphere Payments and Securities Clearance and Settlement Initiative (WHI)*, that was launched in Mexico City in January 1999<sup>3</sup>, has been undertaking assessments of payments and securities clearance and settlement systems in the Western Hemisphere. The second meeting of the Initiative's International Advisory Council (IAC), hold in Mexico City in 1999, recommended to undertake the assessments based on accepted international standards and best practices. Regarding payments clearance and settlement systems the Initiative has been using for the assessments the CPSS document "Core Principles for Systemically Important Payment Systems" since its first release (December 1999). Regarding securities clearance and settlement systems the Initiative elaborated a methodology based on the existing international standards and best practices (working paper 1<sup>4</sup>). The recent release, January 2001, of the CPSS/IOSCO Task Force document "Recommendations for Securities Clearance and Settlement Systems" has motivated a review and update of the WHI methodology, that is presented in this working paper.

Thus, the purpose of this working paper is to provide an updated tool to assess securities clearance and settlement systems in the context of the WHI. The recommendations/international standards/best practices have been grouped in such a way that facilitates the analyses of the relevant issues, although other classifications could have been applied. This document uses the already existing recommendations/international standards/best practices issued by institutions with high expertise in securities clearance and settlement (see Annex 2) with special attention the new CPSS/IOSCO document. This document is now the basis for assessing the securities settlement system although references to other international standards have been maintained. The new version of the WHI methodology to assess securities clearance and settlement systems has been already used for the Colombian country study (February 2001).

The rest of the document is organized as follows. Section 2 presents the assessment methodology classifying the recommendations/international standards/best practices in seven categories in order to facilitate the analysis. An important feature of the WHI is the holistic approach in the payments system, that is, jointly analyses of payments and securities clearance and settlement systems. For this reason, section 3 includes a discussion about cooperation in the payments system. Finally, annex 1 consists of a matrix that summarizes the methodology and annex 2 lists the international standards used in the assessment.

## 2. ASSESSMENT OF COUNTRY X SECURITIES CLEARANCE AND SETTLEMENT SYSTEMS IN TERMS OF THE INTERNATIONAL STANDARDS AND OBSERVATIONS

This section contains the guidelines for an assessment of the clearance and settlement system for securities in terms of international standards and best practices. The assessment methodology is described in the following paragraphs.

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<sup>3</sup> For a detailed description of the WHI see Cirasino, M. and Guadamillas, M., *The Western Hemisphere Payments and Securities Clearance and Settlement Initiative, Payments System Worldwide*, also available in [www.ipho-whpi.org](http://www.ipho-whpi.org).

<sup>4</sup> Working paper 1 consists of a matrix (available in [www.ipho-whpi.org](http://www.ipho-whpi.org)) that was prepared by the securities team that visited Chile in December 1999 and included: De La Lastra, Iñigo (Comisión Nacional del Mercado de Valores, CNMV Spain); Guadamillas, Mario (World Bank) and Holttinen, Eija (IADB consultant-Financial Supervision Authority, FSA Finland). The document was modified by the securities team that visited Trinidad and Tobago in February 2000 and included: Guadamillas, Mario (World Bank); Salas, Andrea (Comisión Nacional de Valores, CNV Argentina) and Saverson, Ester (US Securities Exchange Commission, US SEC).

In the “Observations Reports”, of confidential nature, produced by the Initiative’s mission teams seven main topics (presented separately for analysis purposes although there is a strong inter-relationship among them) are included below with four sub-sections for each one: the related CPSS/IOSCO recommendations, context, situation in country X and recommendations and observations. The first subsection presents the 18 recommendations included in the CPSS/IOSCO document related to the respective main topic. The second subsection discusses the content of standards associated with the main topic. The third subsection discusses the current status of the clearance and settlement mechanisms in country X. Finally, the last section makes specific observations to improve clearance and settlement. In addition, for each main topic an objective has been identified taking into account the recommendations/standards that it includes.

## **1. LEGAL ISSUES**

***Objective:** To establish a sound legal basis that is also able to accommodate technological advances in the operation of the system.*

### ***CPSS/IOSCO Recommendations involved***

***Recommendation 1. (Legal Framework) Securities settlement systems should have a well-founded, clear, and transparent legal basis in the relevant jurisdictions.***

#### *Context*

The reliable and predictable operation of a Securities Settlement System (SSS) depends on (i) the laws, rules, and procedures that support the holding, transfer, pledging, and lending of securities and related payments; and (ii) how these laws, rules, and procedures work in practice, that is, whether system operators, participants, and their customers can enforce their rights. If the legal framework is inadequate or its application uncertain, it can give rise to credit or liquidity risks for system participants and their customers or to systemic risks for financial markets as a whole.

A variety of laws and legal concepts can effect the performance of clearing and settlement systems. Contract laws, company laws, bankruptcy and insolvency laws, custody laws and property laws may impede the performance of a clearing system. The general need is to have an adequate legal basis that is able to accommodate technological advances and, in this way, does not constitute a constraint for the operation or future development of the system. Key aspects of the settlement process that the legal framework should support include: enforceability of transactions, protection of customer assets (particularly against insolvency of custodians), immobilization or dematerialization of securities, netting arrangements, securities lending (including repurchase agreements and other economically equivalent transactions), finality of settlement, arrangements for achieving delivery versus payment, default rules, liquidation of assets pledged or transferred as collateral, and protection of the interests of beneficial owners. The rules and contracts related to the operation of the SSS should be enforceable in the event of the insolvency of a system participant, whether the participant is located in the jurisdiction whose laws govern the SSS or in another jurisdiction.

Another important emerging issue is the legal status of digital signatures. If digital signatures are to substitute for handwritten signatures, they must have the same legal status as handwritten signatures, i.e., they must be legally binding. A critical need is to ensure that laws are both enforced and are enforceable in all relevant jurisdictions. In addition, disputes should become the subject of court proceedings only as a last resort. This can be achieved through the specification and acceptance of comprehensive and fair arbitration processes that are clear and non-ambiguous.

### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

## **2. CLEARING AND SETTLEMENT PROCESSES**

***Objective:*** *To have prompt and reliable systems for processing trades, that are cost-effective and a convenient system for its participants.*

### ***CPSS/IOSCO Recommendations involved***

***Recommendation 2. (Trade confirmation) Confirmation of trades between direct market participants should occur as soon as possible after trade execution, but no later than trade date (T+0). Where confirmation of trades by indirect market participants (such as institutional investors) is required, it should occur as soon as possible after trade execution, preferably on T+0, but no later than T+1.***

***Recommendation 3. (Settlement cycles) Rolling settlement should be adopted in all securities markets. Final settlement should occur no later than T+3. The benefits and costs of a settlement cycle shorter than T+3 should be assessed.***

***Recommendation 5. (Securities lending) Securities lending and borrowing (or repurchase agreements and other economically equivalent transactions) should be encouraged as a method for expediting the settlement of securities transactions. Barriers that inhibit the practice of lending securities for this purpose should be removed.***

***Recommendation 16. (Communication procedures and standards) Securities settlement systems should use or accommodate the relevant international communication procedures and standards in order to facilitate efficient settlement of cross-border transactions.***

### *Context*

The clearance and settlement process includes capturing trade information, trade matching, confirming and affirming institutional investor's trades, clearing, and settlement. Various international organizations have attempted to set standards for the prompt, efficient and effective trade processing, including its cost-effectiveness (both, in terms of system operation and fees paid by participants), and ease and convenience of use. One of the most widely recognized concepts is that the longer it takes to settle a securities trade the greater is the risk that settlement may not take place. In this regard, the CPSS/IOSCO document recommends that trade settlement should occur by T+3 or less. However, T+3 often is no longer regarded as best practice. Clearly the shortest possible elapsed time between trade date and settlement date is a desirable goal in system design. Nevertheless, the practical impact of shortening this time must be assessed, especially if it has an impact on the number of trades that fail to settle.<sup>5</sup> Same day settlement could be considered as the final goal, although it is generally recognized that this may not be achievable in the short/medium term, particularly for cross-

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<sup>5</sup> *Currently, there is a debate about the adequacy of moving the settlement cycle to T+2. However, given the globalization process in financial markets, there is an increasing necessity to standardize this process at an international level, even if this could imply that some countries should increase their settlement cycle.*

border transactions. The magnitude of the changes required to achieve a particular standard must also be carefully considered. For example, whereas it might be relatively easy to move from T+5 to T+3 by simply imposing more discipline on all system participants; more fundamental changes (process re-engineering) in all aspects of the system are likely to be necessary to move to T+2 or T+1. Regardless of the settlement cycle, the frequency and duration of settlement failures should be monitored closely.

The profile of market investors (retail vs. wholesale, amount of foreign investment) as well as their intermediaries should be taken into account as this can influence the practicality of the targeted clearing and settlement cycle. Appropriate trade-off between risk, cost, and convenience must be made, else the system will not satisfy user requirements at an affordable and acceptable cost and thus might constrain market development.

Another widely recognized concept is that trade matching should occur as soon after the trade as possible so those errors and discrepancies can be discovered early in the settlement process. The CPSS/IOSCO recommended that trade comparison should be accomplished by T+0, and in any case later than T+1. In addition, indirect market participants -- institutional investors and custodians -- should be members of a trade comparison system that achieves positive affirmation of trade details. Moreover, there should also be an integration system for trade matching, comparison and book-entry settlement of securities and funds. An automated link between the Exchange/OTC and the CSD is generally considered to be desirable and is a prerequisite for broker/dealer straight through processing from execution to settlement. Likewise, when clearing and depository services are provided by different entities, it is recommended that these two functions are closely tied together, otherwise finality of settlement is difficult to achieve. Fortunately, the cost of implementing automated systems is reducing, however, care should be taken to ensure that sufficient transaction volume exists and that users are willing to pay for the automated services based on tangible benefits in terms of efficiency or risk reduction.

Mature and liquid securities lending markets (including markets for repurchase agreements and other economically equivalent transactions) generally improve the functioning of securities markets by allowing sellers ready access to securities needed to settle transactions where those securities are not held in inventory, by offering an efficient means of financing securities portfolios, and by supporting participants' trading strategies. The existence of liquid markets for securities lending reduces the risks of failed settlements because market participants with an obligation to deliver securities that they have failed to receive and do not hold in inventory can borrow these securities and complete delivery. Securities lending markets also enable market participants to cover transactions that have already failed, thereby curing the failure sooner. Intraday finality is crucial for these operations. In cross-border transactions, particularly back-to-back transactions, it is often more efficient and cost-effective for a market participant to borrow a security for the delivery rather than to deal with the risk and costs associated with a settlement failure.

Because of increased automation and globalization of securities markets, it is beneficial from an interconnectivity perspective for domestic systems to use internationally recognized securities identification numbering standards. With this in mind, the G30 recommended that all markets should adopt a numbering system that meets the International Securities Identification Number (ISIN) standards. The CPSS/IOSCO document insisted again in this point through its recommendation 16.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

## *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

### **3. SETTLEMENT RISKS**

*Objective: To achieve final and irrevocable DvP and improve the overall efficiency of the settlement process.*

#### *CPSS/IOSCO Recommendations involved*

*Recommendation 6. (Central Securities Depositories -CSDs) Securities should be immobilised or dematerialised and transferred by book-entry in CSDs to the greatest extent possible.*

*Recommendation 4. (Central counterparties) The benefits and costs of a central counterparty should be assessed. Where such a mechanism is introduced, the central counterparty should rigorously control the risks it assumes.*

*Recommendation 7. (Delivery Versus Payment -DvP) Securities settlement systems should eliminate principal risk by linking securities transfers to funds transfers in a way that achieves delivery-versus-payment.*

*Recommendation 8. (Timing of settlement finality) Final settlement on a DvP basis should occur by the end of the settlement day. Intraday or real-time finality should be provided where necessary to reduce risks to users of the system.*

*Recommendation 9. (CSD risk controls to address participant defaults) Deferred net settlement systems should institute risk controls that, at a minimum, ensure timely settlement in the event the participant with the largest payment obligation is unable to settle. In any system in which a CSD extends credit or arranges securities loans to facilitate settlement, best practice is for the resulting credit exposures to be fully collateralised.*

*Recommendation 10. (Cash settlement assets) Assets used to settle the cash leg of securities transactions between CSD members should carry little or no credit or liquidity risk. If central bank money is not used, steps must be taken to protect participants from potential losses and liquidity pressures arising from the failure of a settlement bank.*

#### *Context*

The important issues of efficiency and flexibility have been touched on previously. The safety of the system is paramount from a participant and a regulatory perspective and should be given specific attention. The settlement process exposes market participants and clearance and settlement systems to different risks. The system should be designed to minimize these risks. The immobilization or dematerialization of securities reduces or eliminates certain risks, for example, destruction or theft of certificates. The transfer of securities by book-entry is a precondition for the shortening of the settlement cycle for securities trades, which reduces replacement cost risks.

The major settlement risk is counterparty risk (credit/principal risk). DvP is one of the primary means by which a market can reduce the risk inherent in securities transactions. The DvP concept seeks to eliminate principal risk from securities transactions by ensuring that sellers give up their securities if,

and only if, they receive full payment and vice versa. There are three essential elements in a DvP transaction: (a) good and irrevocable delivery of securities, (b) final and irrevocable funds, and (c) simultaneous exchange. The CPSS of the BIS has identified three different models of DvP.<sup>6</sup> although these models vary in their approach to achieving DvP, all three models meet the concept of real DvP.

The use of a central counterparty that interposes itself between the counterparties to securities trades is becoming more and more a common practice. It is an especially effective tool for reducing risks vis-à-vis active market participants. But use of a central counterparty concentrates risk, and it reallocates risk among its participants through its policies and risk management procedures. The ability of the system as a whole to withstand the default of individual participants depends crucially on the risk management procedures of the central counterparty and its access to resources to absorb financial losses.

There are a variety of risk management procedures to reduce market risk and strengthen a DvP mechanism. Those procedures include admission standards, member's creditworthiness monitoring, novation, participation funds, collateral, margins, buy-ins and sell-outs, net debit caps, bilateral credit limits and loss sharing arrangements. Most settlement systems use more than one procedure to minimize market risk. In addition, there are a number of mechanisms designed to improve the settlement process. Among them are: central lending facilities; pledge recording facilities and prompt re-registration procedures. Properly regulated securities lending and borrowing can bring significant benefits to a market and its users leading to more liquid markets. Short selling could be a useful mechanism to add liquidity. However, when short selling is permitted, regulation must guard against manipulative practices, including those associated with a significant short position.

Systems that are considering whether to implement RTGS or a netting scheme should carefully study market volume and participation to determine if these mechanisms are appropriate. Historically, netting was introduced as an efficient measure to reduce the amount of physical documents passing between market members. Later, with the introduction of early computer systems, it was used to reduce the number of electronic settlements. Today, with high speed and powerful computers and the introduction of RTGS systems, the efficiency advantages are less important. Thus, the debate is focused on the trade-off between liquidity requirements and risk mitigation as discussed previously in this paper.

Settling in same day funds<sup>7</sup> is essential when operating in an RTGS environment and is useful in achieving real intra-day DvP. In order to achieve timely and risk-free settlement in same day funds, efficient banking arrangements will need to be developed that will enable funds to be moved quickly and relatively inexpensively.

Finality of both payments and securities' ownership transfer is a crucial factor in the development of a securities market. Otherwise, only local investors will operate in the market based on well-established client relationships and the confidence that this provides. In emerging markets, this factor is of critical importance if there is a desire to attract foreign investment. Foreign investors will be reluctant to participate in a market that is not considered to be safe and sound. Payments finality is equally important.

The failure of any bank that provides cash accounts to settle payment obligations for CSD members could disrupt settlement and result in significant losses and liquidity pressures. Use of the central bank of issue as the single settlement bank may not, however, always be practicable. In such cases, a

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<sup>6</sup> *Vid.* Delivery versus Payment in Securities Settlement Systems, 1992, CPSS, BIS.

<sup>7</sup> *Payment is made in "same day" funds when payment of such funds is made on an irrevocable basis to the counterpart on the day of settlement such that they are available for use on the day of settlement.*

private bank sometimes is used as the single settlement bank and steps must be taken to protect CSD members from potential losses and liquidity pressures that would arise from its failure.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

#### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

#### **4. OPERATIONAL ISSUES**

***Objective:*** *To provide the system with an adequate operational reliability and capacity that at the same time is cost effective.*

#### ***CPSS/IOSCO Recommendations involved***

***Recommendation 11. (Operational reliability) Sources of operational risk arising in the clearing and settlement process should be identified and minimized through the development of appropriate systems, controls, and procedures. Systems should be reliable and secure, and have adequate, scalable capacity. Contingency plans and backup facilities should be established to allow for timely recovery of operations and completion of the settlement process.***

***Recommendation 15. (Efficiency) While maintaining operational safety, securities settlement systems should be cost effective in meeting the requirements of users.***

#### *Context*

Operational risk is the risk that deficiencies in information systems or internal controls, human errors, or management failures result in unexpected losses. As clearing and settlement systems become increasingly dependent on information technology systems, the reliability of these systems is a key element in operational risk. Operational risk can arise from inadequate control of systems and processes; from inadequate management more generally (lack of expertise, poor supervision or training, inadequate resources); from inadequate identification or understanding of risks and the controls and procedures needed to limit them; and from inadequate attention being paid to ensuring that procedures are understood and complied with.

In order to minimize operational risk, system operators should identify sources of operational risk. All key systems should be secure (i.e. have access controls, adequate safeguards to prevent external intrusions, and provide audit trails), reliable, scalable and able to handle stress volume and have appropriate contingency plans to account for system interruption. The system should maintain an adequate capacity to process current and anticipated future transaction volume, including projected peak day and peak hour volume demands. To achieve this, the operator must: (a) establish formal current and future capacity estimates for their automated trade comparison systems; (b) conduct periodic capacity stress tests to determine the behavior of systems under a variety of simulated conditions; and (c) conduct independent annual reviews to assess whether these systems can perform adequately at their current and estimated future capacity levels.

Operational capacity must also be demonstrated to exist at the mandatory disaster-recovery site. Operators must also have in place a well designed and adequately tested mechanism for transferring system control to the back-up site in an acceptable time-frame without loss of data or unacceptable

reduction in service levels.

In assessing the efficiency of settlement systems, the needs of users and the costs imposed on them must be carefully balanced with the requirement that the system meet appropriate standards of safety and security.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

#### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

### **5. CUSTODY RISK**

***Objective:*** *To safeguard securities and funds under custody and all associated records.*

#### ***CPSS/IOSCO Recommendations involved***

***Recommendation 12. (Protection of customers' securities) Entities holding securities in custody should employ accounting practices and safekeeping procedures that fully protect customers' securities. It is essential that customers' securities be protected against the claims of a custodian's creditors.***

#### *Context*

Custody risk is the risk of a loss on securities held in custody occasioned by the custodian's (or subcustodian's) insolvency, negligence, misuse of assets, fraud, poor administration, or inadequate record keeping. A custodian should employ procedures ensuring that all customer assets are appropriately accounted for and kept safe. Customer securities also must be protected against the claims of the custodian's creditors, and typically client assets are given preferential treatment under insolvency law.

Custodians must have a demonstrable capability to safeguard securities and funds in their custody or control or for which it is responsible, and for protecting against reasonably anticipated internal or external threats to the integrity of its operations. In many markets, settlement is carried out and controlled through automatic data processing systems. In these cases, the system should have appropriate procedures to back-up data and a contingency plan to minimize disruptions.

Electronic technologies now in place or under development, such as the use of internet for initiating financial transactions increase consumer choice but at the same time provide additional means for abuse and illegal activity. Safeguards should anticipate, and be designed to provide protection against the possibility of theft, accidental or malicious destruction or loss of securities or funds and the possibility of accidental or intentional, but unauthorized, modification, disclosure or destruction of data.

In connection with these objectives, the organization should have an adequately staffed internal audit department, which has the authority to review, monitor, and evaluate the organization's system of internal controls and the integrity of the operational procedures.

In summary, particular attention is required to reduce fraud. Some of the issues to be addressed are: (a) the operational security of systems including identification systems, message authentication and protection measures in safeguarding access to the system; (b) to ensure protection against insider

fraud; (c) to have a regular independent audit of the systems to ensure continued system integrity; and (d) the determination of liability for loss or technical failure.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

#### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

## **6. REGULATORY AND OVERSIGHT ISSUES**

***Objective:** The system for clearance and settlement of securities transactions should be subject to regulatory oversight, and designed to ensure that it is fair, effective and efficient and that it reduces systemic risk.*

#### *CPSS/IOSCO Recommendations involved*

***Recommendation 18. (Regulation and oversight) Securities settlement systems should be subject to regulation and oversight. The responsibilities and objectives of the securities regulator and the central bank with respect to SSSs should be clearly defined, and their roles and major policies should be publicly disclosed. They should have the ability and the resources to perform their responsibilities, including assessing and promoting implementation of these recommendations. They should cooperate with each other and with other relevant authorities.***

#### *Context*

Regarding regulation and oversight by the authorities, an specific allocation of responsibilities for securities clearance and settlement supervision is important. However, in most cases, this function is performed together with the general supervision function of the participant entities without any special attention being given to clearance and settlement issues. There is a trend towards regulatory oversight policy being implemented at two levels that is substituting for traditional direct supervisory activity. The regulator conducts the oversight of the Self-Regulatory Organizations (SROs) (CSDs, exchanges) activities, while these institutions perform the same function with regard to its participants.

A securities regulator should have the authority to license central clearinghouses and CSDs (System Operators) as SROs and review and approve their rules. As an SRO, a system operator should have the authority to make and enforce rules on its participants. The securities regulator should have the power to issue the guidelines that system operators should follow. In addition, the securities regulator should assure that the rules and procedures issued by SROs permit a sound and effective operation of the system and provide fair access to all market participants. The securities regulator should also have the authority to conduct periodic inspections, require the production of periodic reports and enforce the securities laws and regulations.

Mutual cooperation between the securities regulator and the central bank as well as their cooperation with other relevant authorities is important in achieving their respective policy goals.

### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

## **7. CENTRAL SECURITIES DEPOSITORIES (CSDs) ORGANIZATIONAL ARRANGEMENTS**

***Objective:*** *To have the broadest participation without affecting the security of the system including adequate governance arrangements and transparency.*

### ***CPSS/IOSCO Recommendations involved***

***Recommendation 14.*** *(Access) CSDs and central counterparties should have objective and publicly disclosed criteria for participation that permit fair and open access.*

***Recommendation 13.*** *(Governance) Governance arrangements for CSDs and central counterparties should be designed to fulfil public interest requirements and to promote the objectives of owners and users.*

***Recommendation 17.*** *(Transparency) CSDs and central counterparties should provide market participants with sufficient information so that they can accurately identify and evaluate the risks and costs associated with using the CSD or central counterparty services.*

### *Context*

It is widely accepted that a securities market should be supported by the CSD with the broadest possible industry participation. Admission should be open to all qualified market participants needing access to the CSD.<sup>8</sup>

Membership standards for system operators should be established in order to minimize risk. Certain minimum standards of financial responsibility, operational capacity (including system security and integrity), experience and competence should be prescribed for participation in the systems. Mandatory capital requirements for participants are the first safety net to mitigate against a participant failure and, thus, an important risk management tool. However, these requirements are frequently established for reasons other than clearance and settlement and a system operator should have the authority to impose higher financial standards on its members/participants if the general requirements do not cover adequately the perceived risks.

The rules for clearing and depository organizations should avoid unfair discrimination in regard to the admission of participants or among participants in the use of the system. The rules should provide fair procedures for review of decisions concerning denials of access. In addition, the system should provide participants with a meaningful opportunity to participate in the administration of the organization's affairs.

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<sup>8</sup> *The cost is an important element to consider in order to avoid an unfair situation for the minority investor. In any case, transactions cost per unit should be clearly identified.*

This recommendation focuses on CSDs and central counterparties, which sit at the heart of the settlement process. Many are sole providers of services to the markets they serve, and their performance is a critical determinant of the safety and efficiency of those markets. Therefore, their performance is a matter of public as well as private interest. In addition, there may be other providers of services (for example trade comparison or messaging services) whose performance is also critical to the functioning of some markets. The governance arrangements of any critical service providers should also be consistent with this recommendation.

No single set of governance arrangements is appropriate for all institutions within the various securities markets and regulatory schemes. However, an effectively governed institution should meet certain basic requirements. Governance arrangements should be clearly articulated, coherent, comprehensible, and fully transparent. Governance arrangements should therefore seek to minimize the conflicts between the objectives of owners, users, and other interested parties, and as far as possible to resolve any remaining conflicts.

Financial markets operate most efficiently when participants have access to relevant information concerning the risks to which they are exposed and, therefore, can take actions to manage those risks. The need for transparency applies to the entities that form the clearing, settlement, and custodial infrastructure of the securities markets. Informed market participants are better able to evaluate the costs and risks to which they are exposed as a result of participation in the system. Relevant information should be accessible to market participants. Information should be current and available in formats that meet the needs of users.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

#### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

## **2. COOPERATION IN THE PAYMENTS SYSTEM**

### *Context*

Effective cooperation among market participants, between regulators and market participants and among regulators is essential for the development of a sound and efficient payments system. In particular, the “cross-nature” element that characterizes the transfer of money and the “systemic nature” of the underlying operating procedures make the payments system an “institution” whose existence and smooth functioning requires effective cooperation between all participants. On the one hand, the use of payment instruments generates significant externalities on the demand side, since the usefulness of an instrument is strictly linked to the degree of its acceptance and use for transaction purposes. Consequently, widespread use of new payment instruments and services relies heavily on public confidence in them. On the other hand, within the payment system, the supply of services can be affected by coordination failures due to the existence of conflicts of interests (and information costs) as well as the intermediaries’ unwillingness to cooperate. This can lead to “sub-optimal” equilibrium in the organizational arrangements as to the system’s reliability and efficiency. The payment system overseer is therefore entrusted with making up for a specific type of failure in the market for payment services, i.e. the coordination failures. Cooperation problems may be especially relevant within interbank clearing and settlement

systems. In fact, in these systems the risk profiles – both at the system level and at the level of the individual intermediary – may not be fully assessed by participants. In addition, the concern with having to support less reliable intermediaries may lead larger participants to discriminate against smaller ones, even when these are technically eligible to participate in the system. Finally, the payment system industry also depends on agreements between producers to ensure that different components of the system are compatible. Most recently, the emergence of new types of non-bank intermediaries and payment instruments has strengthened the need for a comprehensive level of cooperation in the payment system.

With regard to the cooperation among regulators, the safety and efficiency objectives of payment and securities settlement systems may be pursued by a variety of public sector authorities, in addition to the central bank and the securities commission. Examples of these regulators include legislative authorities, ministries of finance, competition authorities. There are also complementary relationships between oversight, bank supervision and market surveillance. Appropriate cooperation among supervisors can be achieved in a variety of ways, for example, exchanges of views and information between relevant authorities may be conducted by holding regular or ad hoc meetings. Agreements on the sharing of information may be useful for such exchanges.

#### *Status in Country X*

Information about the system(s) of the country is included and analyzed in relation to the standards/recommendations.

#### *Observations*

Specific observations by the mission team are included aiming at improving the systems regarding the standards/recommendations analyzed.

**ANNEX I. ASSESSMENT AND RECOMMENDATIONS MATRIX**

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
<b>1. Legal Issues</b> <ul style="list-style-type: none"> <li>Objective: sound legal basis that is also able to accommodate technological advances in the operation of the system</li> </ul>	<b>1.1 Legal Framework</b> <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>Securities settlement systems should have a well-founded, clear, and transparent legal basis in the relevant jurisdictions.</li> </ul>		
	1.2 Clear definition of property rights including protection of interests of beneficial owners <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>There should be a clear legal definition of securities property rights. (EU1a, IOSCO1)</li> </ul>		
	1.3 Bankruptcy and Insolvency Laws (protection of customer assets) <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>Protection of customer assets particularly against insolvency of custodians</li> <li>The pool of securities or interests held in a depository should be protected against the claims of the depository and broker's general creditors. (IOSCO2)</li> </ul>		
	1.4 Electronic Documents and Signatures 1.5 Legal support of immobilization and dematerialization of securities) <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>The law should recognize electronic documents and signatures to facilitate securities trading, clearing and settlement.</li> <li>In particular, the legal framework should support immobilization and dematerialization of securities and their transfer by book-entry</li> </ul>		
	1.6 Netting arrangements (legal basis) <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>There should be sound legal basis for netting including the legal recognition of novation. (L1, CPI, EU1, FIBV5)</li> </ul>		
	1.7 Finality of settlement (legal basis) <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>The legal framework should support finality of settlement</li> </ul>		
	1.8 Pledging <i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>The legal framework should support the liquidation of assets pledged or transferred as collateral to support participants' obligations</li> <li>Procedures for creating and enforcing a pledge of interests in securities should be simplified in order to encourage the collateralization of credit exposure in an immobilized or dematerialized system. (IOSCO5)</li> </ul>		
	1.9 Relevant jurisdictions/ Conflicts of laws	<ul style="list-style-type: none"> <li>Evaluation of the legal framework for other relevant jurisdictions</li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
	<i>Recommendation 1</i>	<ul style="list-style-type: none"> <li>There should be clear mechanisms to resolve legal uncertainties and conflicts. (IOSCO4)</li> </ul>		
2. Clearing and Settlement processes	<b>2.1 Trade confirmation</b> <i>Recommendation 2</i>	<ul style="list-style-type: none"> <li><b>Confirmation of trades between direct market participants should occur as soon as possible after trade execution, but no later than trade date (T+0). Where confirmation of trades by indirect market participants (such as institutional investors) is required, it should occur as soon as possible after trade execution, preferably on T+0, but no later than T+1.</b></li> <li>If possible, automated links should be established between the trading system and the settlement system. (IOSCO13.10)</li> <li>Institutional investors and custodians should be members of a trade comparison system that achieves positive affirmation of trade details. (G30-2, FIBV2)</li> </ul>		
	<b>2.2 Settlement cycle</b> <i>Recommendation 3</i>	<ul style="list-style-type: none"> <li><b>Rolling settlement should be adopted in all securities markets. Final settlement should occur no later than T+3. The benefits and costs of a settlement cycle shorter than T+3 should be assessed.</b></li> <li>A market should achieve settlement by three days after trade date (“T+3”). (G30-7)</li> </ul>		
	<b>2.3 Systems integration</b>	<ul style="list-style-type: none"> <li>There should be an integrated central system for trade matching, book-entry settlement of securities and book-entry settlement of payments. (FIBV8.1.5)</li> </ul>		
	<b>2.4 Securities lending</b> <i>Recommendation 5</i>	<ul style="list-style-type: none"> <li><b>Securities lending and borrowing (or repurchase agreements and other economically equivalent transactions) should be encouraged as a method for expediting the settlement of securities transactions. Barriers that inhibit the practice of lending securities for this purpose should be removed</b></li> <li>Securities lending and borrowing should be encouraged as a method of expediting the settlement of securities transactions. There is a legitimate and important role for securities lending in those markets that permit short selling. (TC 2.3.8)</li> </ul>		
	<b>2.5 Communication procedures</b>	<ul style="list-style-type: none"> <li><b>Securities settlement systems should use or accommodate the relevant international</b></li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
	standards and securities identification <i>Recommendation 16</i>	<p><b>communication procedures and standards in order to facilitate efficient settlement of cross-border transactions.</b></p> <ul style="list-style-type: none"> <li>All traded securities issues should have a security identification number that meets the International Securities Industry Numbering (“ISIN”) standards. (G30-9)</li> </ul>		
<p><b>3. Settlement Risk</b></p> <ul style="list-style-type: none"> <li>Objective: achieve final and irrevocable DvP and improve the overall efficiency of the settlement process</li> </ul>	<p><b>3.1 Central Securities Depositories (CSDs)</b> <i>Recommendation 6</i></p>	<ul style="list-style-type: none"> <li><b>Securities should be immobilized or dematerialized and transferred by book-entry in CSDs to the greatest extent possible.</b></li> <li>A central securities depository should be in place, and the broadest possible industry participation should be encouraged. A CSD’s principal function is to immobilize or dematerialize securities, thereby assuring that the bulk of securities transactions are processed in book-entry form. (G30-3)</li> </ul>		
	<p><b>3.2 Central CounterParty</b> <i>Recommendation 4</i></p>	<ul style="list-style-type: none"> <li><b>The benefits and costs of a Central Counterparty should be assessed. Where such a mechanism is introduced, the Central Counterparty should rigorously control the risks it assumes.</b></li> </ul>		
	<p><b>3.3 Delivery-versus-Payment (“DvP”)</b> <i>Recommendation 7</i></p>	<ul style="list-style-type: none"> <li><b>Securities settlement systems should eliminate principal risk by linking securities transfers to funds transfers in a way that achieves delivery-versus-payment (DvP)</b></li> <li>DvP should be employed as the method for settling all securities transactions. (G30-5)</li> </ul>		
	<p><b>3.4 Timing of settlement finality</b> <i>Recommendation 8</i></p>	<ul style="list-style-type: none"> <li><b>Final settlement on a DvP basis should occur by the end of the settlement day. Intraday or real-time finality should be provided where necessary to reduce risks to users of the system</b></li> <li>Payments associated with securities transactions should be made in same-day funds. (G30-6)</li> <li>The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day. (CPIV)</li> </ul>		
	<p><b>3.5 CSD controls to address participants’ defaults</b> <i>Recommendation 9</i></p>	<ul style="list-style-type: none"> <li><b>Deferred net settlement systems should institute risk controls that, at a minimum, ensure timely settlement in the event the participant with the largest payment obligation is unable to settle. In any system in which a CSD extends credit or</b></li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
		<p><b>arranges securities loans to facilitate settlement, best practice is for the resulting credit exposures to be fully collateralised</b></p> <ul style="list-style-type: none"> <li>• Multilateral netting schemes should have clearly defined procedures, ensure settlement in the case of inability to settle by the participant with the largest single net-debit position and have publicly disclosed criteria for admission which permit fair and open access. (LIII, LIV, LV, CPIII, CPV, CPIX)</li> <li>• Netting and RTGS are effective settlement mechanisms. The regulator and market participants should study market volumes and participation to determine which mechanism is appropriate for their market place and have a clear understanding of the financial risks affected by the netting process. (IOSCO13.11.2, LII, CPII).</li> <li>• Margin requirements may be used in combination with other mechanisms to manage risk to market participants, clearinghouses and exchanges. (IOSCO 13.11, EU6)</li> </ul>		
	<p><b>3.6 Cash settlement assets</b> <i>Recommendation 10</i></p>	<ul style="list-style-type: none"> <li>• <b>Assets used to settle the cash leg of securities transactions between CSD members should carry little or no credit or liquidity risk. If central bank money is not used, steps must be taken to protect participants from potential losses and liquidity pressures arising from the failure of a settlement bank</b></li> </ul>		
	<p><b>3.7 Liquidity Risk</b></p>	<ul style="list-style-type: none"> <li>• Central clearing organizations and CSDs (“System Operators”) should maintain adequate sources of liquidity to meet their financial obligations on a timely basis. Reliance on one source may pose significant risks in the event of a financial crisis, and consideration should be given to diversifying liquidity sources to reduce such risks. The level of necessary liquidity sources should be based on an assessment of the risks to which the organization is subject and should be subject to regulatory review. (TC 1.2, G30-8, IOSCO 13.11.3)</li> </ul>		
<p><b>4. Operational Issues</b></p> <ul style="list-style-type: none"> <li>• Objective: provide the system with</li> </ul>	<p><b>4.1 Operational reliability and capacity</b></p>	<ul style="list-style-type: none"> <li>• <b>Sources of operational risk arising in the clearing and settlement process should be identified and minimized through the development of</b></li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
<p>an adequate operational reliability and capacity that at the same time is cost effective</p>	<p><i>Recommendation 11</i></p>	<p><b>appropriate systems, controls, and procedures. Systems should be reliable and secure, and have adequate, scaleable capacity. Contingency plans and backup facilities should be established to allow for timely recovery of operations and completion of the settlement process</b></p> <ul style="list-style-type: none"> <li>• A System Operator should maintain adequate capacity to process reasonably anticipated volume, including projected peak volume demands. A Systems Operator should establish formal current and future capacity estimates, conduct periodic capacity stress tests, and conduct independent annual reviews to assess whether these systems can perform adequately. (COSRA5)</li> <li>• A System Operator should have back up systems and contingency plans on how it will operate in the event of computer failure or if the computers are unavailable because</li> <li>• of a disaster. A System Operator should periodically test this back up systems and plans. (TC 1.1, CPVII)</li> </ul>		
	<p>4.2 Efficiency <i>Recommendation 15</i></p>	<ul style="list-style-type: none"> <li>• <b>While maintaining operational safety, securities settlement systems should be cost effective in meeting the requirements of users</b></li> </ul>		
<p>5. Custody Risk</p> <ul style="list-style-type: none"> <li>• Objective: safeguarding of securities and funds under custody and associated records</li> </ul>	<p>5.1 Safeguarding of securities and funds (protection of customer's securities) <i>Recommendation 12</i></p>	<ul style="list-style-type: none"> <li>• <b>Entities holding securities in custody should employ accounting practices and safekeeping procedures that fully protect customers' securities. It is essential that customers' securities be protected against the claims of a custodian's creditors</b></li> <li>• A System Operator should have sufficient safeguards to ensure the safety of funds and securities under its control. (COSRA2, EU3)</li> <li>• The pool of securities or interests held in a depository should be protected against the claims of the depository and broker's general creditors. (IOSCO2)</li> </ul>		
	<p>5.2 Integrity of records</p>	<ul style="list-style-type: none"> <li>• A System Operator should be capable of protecting against reasonably anticipated internal or external threats to the integrity of its operations. (COSRA5)</li> <li>• A System Operator should have appropriate</li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
		<p>procedures to back-up data. (TC 1.1)</p> <ul style="list-style-type: none"> <li>• A System Operator should develop contingency plan to minimize disruptions. (TC 1.1)</li> </ul>		
<p><b>6. Regulatory and oversight issues</b></p> <ul style="list-style-type: none"> <li>• Objective: The system for clearance and settlement of securities transactions should be subject to regulation and oversight, and designed to ensure that it is fair, effective and efficient and that it reduces systemic risk.</li> </ul>	<p><b>6.1 Regulation of securities settlement systems</b> <i>Recommendation 18</i></p>	<ul style="list-style-type: none"> <li>• <b>Securities settlement systems should be subject to regulation and oversight. The responsibilities and objectives of the securities regulator and the central bank with respect to SSSs should be clearly defined, and their roles and major policies should be publicly disclosed. They should have the ability and the resources to perform their responsibilities, including assessing and promoting implementation of these recommendations. They should cooperate with each other and with other relevant authorities</b></li> <li>• The system for clearance and settlement of securities transactions should be subject to regulatory oversight and designed to ensure that it is fair, effective and efficient and that it reduces systemic risk. (IOSCO 13.9)</li> <li>• The securities regulator should have the authority to license System Operators as SROs and review and approval their rules. (COSRA4)</li> <li>• The participants should be subject to supervision by a governmental authority or self-regulatory authority subject to governmental oversight. (COSRA1)</li> <li>• As a SRO, a central clearinghouse or CSD should have sufficient organizational structure and capacity to enforce its rules and the securities laws and regulations. (TC 1.3)</li> </ul>		
	<p>6.2 The authority to issue directions (orders and directives)</p>	<ul style="list-style-type: none"> <li>• The securities regulator should have the power to issue directions (orders and regulations) regarding the clearance and settlement of securities transactions and clearing and settlement participants. (IOSCO13.9)</li> </ul>		
	<p>6.3 The authorities have to inspect regulated entities and enforce securities laws and regulations</p>	<ul style="list-style-type: none"> <li>• The securities regulatory authority should have the authority to conduct periodic inspections and require reports and enforce securities laws and regulations. (COSRA3, IOSCO13.9)</li> </ul>		
	<p>6.4 Adequacy of</p>	<ul style="list-style-type: none"> <li>• The securities regulator should have sufficient staff</li> </ul>		

MAIN TOPICS	COMPONENTS	STANDARDS	STATUS IN THE COUNTRY	OBSERVATIONS
	Resources to perform oversight responsibilities	capability with appropriate knowledge and skills to perform its oversight responsibilities. (IOSCO 13.8-13.9)		
7. CSD organizational arrangements  • Objective: to have the broadest participation without affecting the security of the system including adequate governance arrangements and transparency	<b>7.1 Membership Standards (access)</b> <i>Recommendation 14</i>	<ul style="list-style-type: none"> <li>• <b>CSDs and central Counterparties should have objective and publicly disclosed criteria for participation that permit fair and open access</b></li> <li>• There should be an appropriate balance between the need for system security and broad participation in the clearing and settlement system. (COSRA1, LV, CPIX, EU5)</li> </ul>		
	<b>7.2 Governance</b> <i>Recommendation 13</i>	<ul style="list-style-type: none"> <li>• <b>Governance arrangements for CSDs and Central Counterparties should be designed to fulfil public interest requirements and to promote the objectives of owners and users</b></li> <li>• A System Operator should provide its participants with a meaningful opportunity to participate in the administration of its affairs. Participants should a fair voice in the manner in which decisions are made. Participants should be kept adequately informed of proposed rule changes and should be furnished with annual audited financial statements, an audited annual report on internal controls and other relevant reports on a regular basis. (TC 1.5, CPX)</li> </ul>		
	<b>7.3 Transparency</b> <i>Recommendation 17</i>	<ul style="list-style-type: none"> <li>• <b>CSDs and Central Counterparties should provide market participants with sufficient information so that they can accurately identify and evaluate the risks and costs associated with using the CSD or Central Counterparties services</b></li> </ul>		

## ANNEX II. LIST OF INTERNATIONAL STANDARDS

The references are presented below by institution in alphabetical order, indicating the web site where the document is directly available or there is information on how to access it. The list also includes some documents that were used to design the structure of the WHI methodology even if there is not a direct reference to them in the matrix.

### **Bank of International Settlements, BIS ([www.bis.org](http://www.bis.org))**

- *Minimum standards for cross-border and multi-currency netting and settlement schemes (Lamfalussy minimum standards)-1990*  
Reference in the matrix: L I-VI
- *Delivery versus payment in securities settlement systems*, September 1992.
- *Real-time gross settlement systems*, March 1997.
- *Core Principles for Systemically Important Payment Systems*, December 1999. Final version, January 2001.  
Reference in the matrix: CP I-X
- *CPSS(BIS)/IOSCO, Recommendations for Securities Settlement Systems*, January 2001.  
Reference in the matrix: Recommendation 1-18

### **Council of Securities Regulators of the Americas, COSRA**

- *COSRA principles of clearance and settlement -1996*  
Reference in the matrix: COSRA 1-5

### **European System of Central Banks (ESCB) ([www.ecb.int](http://www.ecb.int))**

- *Standards for the use of EU securities settlement systems in ESCB credit operations -1998*  
Reference in the matrix: EU 1-6

### **Group of Thirty, G30 ([www.group30.org](http://www.group30.org))**

- *Group of thirty recommendations regarding securities clearance and settlement (G30)-1989.*  
Reference in the matrix: G30 1-9

### **International Federation of Stock Exchanges, FIBV ([www.fivb.com](http://www.fivb.com))**

- *Clearing and Settlement Best Practices -September 1999*  
Reference in the matrix: FIBV

### **International Services Securities Association, ISSA ([www.issanet.org](http://www.issanet.org))**

- *G30/ISSA Recommendations: 1997 Status Review*, November 1997

**International Organization of Securities Commissions, IOSCO ([www.iosco.org](http://www.iosco.org))**

- *Clearing and Settlement, Report of the Technical Committee*, July, 1990.  
Reference in the Matrix: TC
- *Clearing and Settlement in Emerging Markets: A Blueprint, Report of the Development Committee (now called the Emerging Markets Committee)*, October 1992.
- *Short Selling and Securities Lending: Issues for Consideration, A report by the Emerging Markets Committee*, May 1997
- *Towards a Legal Framework for Clearing and Settlement in Emerging Markets, Report of the Emerging Markets Committee*, November 1997.  
Reference in the Matrix: IOSCO1-5
- *Objectives and Principles of Securities Regulation, Report of IOSCO*, September 1998.  
Reference in the Matrix: IOSCO13.8-13.11
- **CPSS(BIS)/IOSCO**, *Recommendations for Securities Settlement Systems*, January 2001.  
Reference in the matrix: Recommendation 1-18

**Organization for Economic Cooperation and Development (OECD) ([www.ocde.org](http://www.ocde.org))**

- *Systemic Risks in Securities Markets*, OECD Publication Service, Paris, 1991.