



COMMITTEE ON PAYMENT AND SETTLEMENT SYSTEMS

BANK FOR INTERNATIONAL SETTLEMENTS

FSI Connect tutorials on payment and settlement systems

Marc Hollanders

Salvador, November 2007



What is FSI Connect?

A web-based information and learning tool designed for bank supervisors. Now includes tutorials for payment systems

- Comprehensive and interactive content
 - Extensive coverage – wide variety of banking supervision topics
 - Dynamic content – frequent course additions and updates
 - Interactive learning – graphics, examples, case studies, evaluations, forum
- Flexibility
 - Adaptable usage – as a structured learning resource or a simple reference
 - Self-paced learning – based on individual needs and circumstances
 - Ready access – through Internet or CD ROM



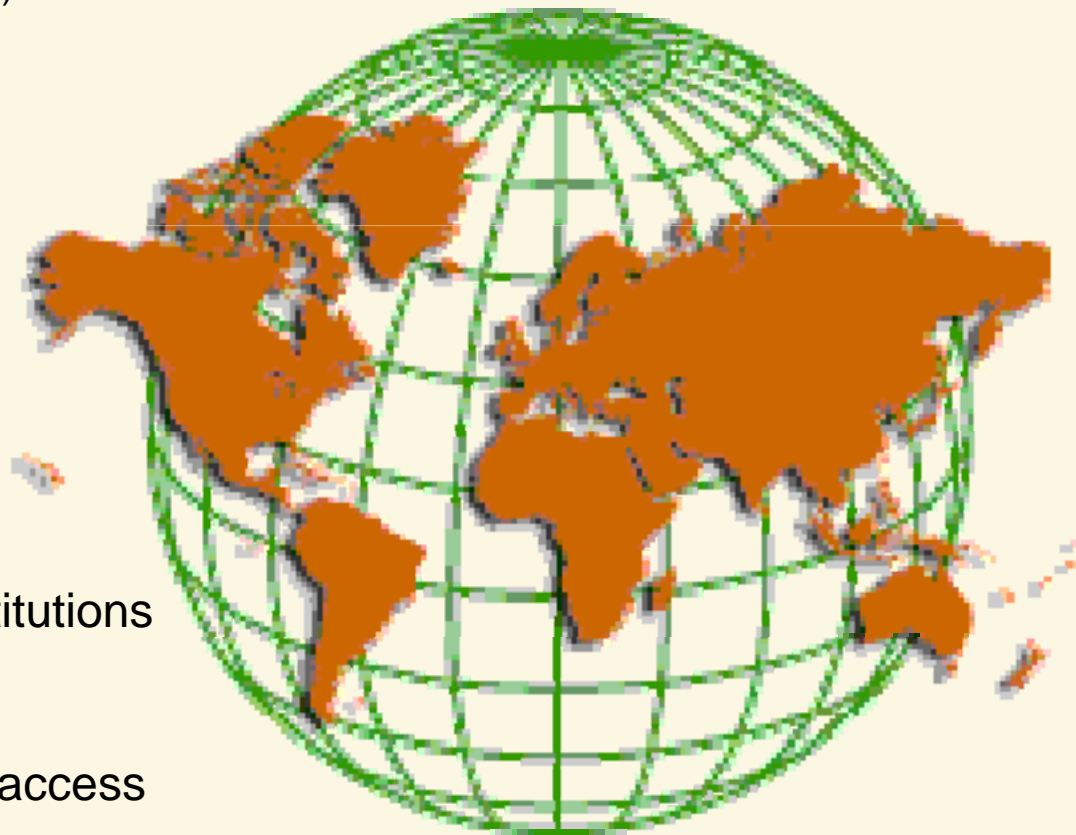
How is FSI Connect used?

- A tool that can be used in combination with other forms of training
- Examples:
 - Pre-requisite for face-to-face training (Federal Reserve)
 - Integrated component of internal training (MAS, APRA)
 - Seminar support (FSI)



Who uses FSI Connect?

(Status as of August 2007)



157 subscribing institutions

128 countries

+8,000 staff having access



In what languages is FSI Connect available?

- English is the primary language
- 40 tutorials on Capital & Basel II have been translated into French and Spanish
- A selection of 13 tutorials has been translated into Chinese

Capital and Basel		Credit Risk		Market Risk		Operational Risk	
Fundamental	Bank Capital Basel I Basel I – Case Study Basel II – An Overview Basel II – Scope of Application Basel II – Pillar 2 – Supervisory Re Basel II – Pillar 3 – Market Disciplin Basel II – Pillar 3 – Market Disciplin Basel II – Operational Risk – BIA & Regulation of Market Risk – An Intr	Fundamental	Credit Risk in the Loan Portfolio The Credit Risk Environment Credit Granting & Administration Credit Analysis Accounts Receivable & Inventor Country Risk Claims on Sovereigns & Govern Claims on Banks & Securities Fi Commercial Loans Agricultural Loans Retail Credit Real Estate Loans Trade Finance Loan Grading Supervisory Credit Classification Loan Loss Provisioning – An Int Managing Problem Loans	Fundamental	Equities – An Introduction Bonds – An Introduction Bonds Pricing and Yield to Matu Commodities – An Introduction Interest Calculations & Compou Present Value, Future Value & I NPV, IRR & Reinvestment Risk Duration & Convexity Math – Differentiation & Integral Forwards – An Introduction Futures – An Introduction Options – An Introduction Swaps – An Introduction VAR – An Introduction Regulation of Market Risk – An	Fundamental	Operational Risk – An Introduction Operational Risk Management – Sound Practices Operational Risk Case Study Basel II – Operational Risk – BIA & SA
	Basel II – An Introduction to Cross-Implementation Basel II – Practical Considerations Implementation Credit Risk Components* External Credit Risk Assessments* Basel II – SA – External Credit Ris Basel II – SA – Risk Weight Frame Basel II – Simplified Standardized / Basel II – Overview of Credit Risk I Basel II – IRB – An Introduction Basel II – Interest Rate in the Bank Basel II – Credit Risk Mitigation – C Credit Derivatives Basel II – Credit Risk Mitigation – C Netting Basel II – Introduction to Superviso Regulation of Market Risk – Stand:		Credit Risk Components External Credit Risk Assessment Credit Derivatives – An Introduc Credit Derivatives – Types Credit Derivatives – Uses & App Credit Derivatives – Pricing Met Securitization – Fundamentals Securitization – Asset-backed S Securitization – Mortgage-backe Loan Loss Provisioning – Metho Loan Loss Provisioning – Types		Volatility Probability & Expected Return Distributions & Confidence Leve Bond Strategies – Fundamental Forwards – Pricing & Contract V Futures – Hedging Futures – Examples of Hedges Futures – Trading Futures – Arbitrage Options – Pricing Models Options – The Binomial Option f Options – Introduction to Option Swaps – Interest Rate Swap Pri Swaps – Interest Rate Swap Va Swaps – Currency Swap Pricing Regulation of Market Risk – Star	Advanced	Basel II – Operational Risk – AMA
	Basel II – Stress Testing <input type="checkbox"/> Basel II – Credit Risk Mitigation un Basel II – IRB – Overview of Minim Basel II – IRB for Corporates, Bank Basel II – IRB for Retail <input type="checkbox"/> Basel II – IRB for Specialized Lend Basel II – IRB for Equity <input type="checkbox"/> Basel II – IRB for Purchased Receivables <input type="checkbox"/> Basel II – IRB – Underlying Math and Theory <input checked="" type="checkbox"/> Basel II – Securitization – Operational Requirements <input checked="" type="checkbox"/> Basel II – Securitization <input type="checkbox"/> Economic Capital & RAROC – An Introduction Economic Capital & RAROC – Approaches and Allocation Basel II – Operational Risk – AMA* Banks' Internal Rating Systems <input type="checkbox"/> Regulation of Market Risk – Internal Models Approach* Securitization – Special Features <input type="checkbox"/>	Intermediate	Credit Risk Modeling – An Intro Credit Risk Modeling – CreditMe Credit Risk Modeling – CreditRis Credit Risk Modeling – KMV & C Models	Intermediate	Options – Trading Strategies Options – Exotic Options VAR – Variance-Covariance App VAR – Monte Carlo Simulation VAR – Historical Simulation & O Regulation of Market Risk – Inte Approach	Other Topics	
Advanced						Payment Systems	
						Payment Systems – An Introduction <input type="checkbox"/> Large-value Payment Systems Payment Systems – Liquidity Payment Systems – Risks Expected soon: Settlement of FX Transactions Payment Systems - Oversight Securities Settlement Systems Retail Payment Systems <input type="checkbox"/>	



New tutorials for payment systems (I)

- Designed for supervisors and staff from payment system departments in central banks
- Based on the experience of the CPSS central banks and CPSS reports
- First four tutorials available since July 2007
- Total of eight tutorials available by March 2008



New tutorials for payment systems (II)

Available:

- Payment systems – an introduction
- Large-value payment systems
- Payment systems – liquidity
- Payment systems – risks

Expected soon:

- Settlement of foreign exchange (FX) transactions
- Payment systems – oversight
- Securities settlement systems
- Retail payment systems

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- 06. Payment Systems
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 - Large-value Payment Systems ▶▶
- Accounting Tutorials
- Banks' Internal Rating Systems
- Basel II - IRB - Purchased Receivables
- Basel II - IRB - Securitization - A Case Study
- Basel II - IRB - Underlying Math and Theory
- Basel II - IRB for Retail
- Basel II - IRB for Specialized Lending
- Basel II - Stress Testing
- Distributions & Hypothesis Testing
- Financial Markets - An Introduction
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- Interest Rate Risk in the Banking Book
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Payment Systems - Liquidity

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Intraday Liquidity

Sources of Intraday Liquidity

For an individual participant in an RTGS system there are four possible sources of intraday liquidity:

- [balances maintained on account with the settlement institution](#)
- [credit extended by the settlement institution](#)
- [payments from other participants](#)
- [funds transferred from other systems](#)

These sources of funding may be used separately or (more often) in combination. Their importance for funding liquidity depends on many factors, including the rules of the system, central bank credit policy, reserve requirements and the legal framework. The sources of funding also influence the aggregate level of liquidity in the system.

Click each source for more information. When you have finished, click the Forward arrow to continue.

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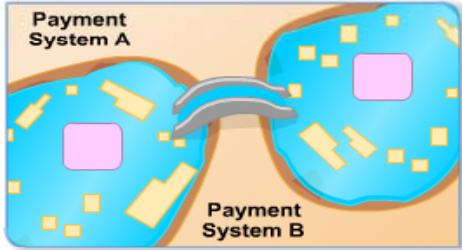
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Funds Transferred from Other Systems
In some countries, participants can obtain intraday funds through existing linkages between different payment and settlement systems. By using these linkages, participants can prefund their opening balances or obtain additional liquidity during the operating day.

Usually the LVPS that facilitates monetary policy operations and through which the central bank provides intraday credit is also used as a source of liquidity for other systems.



Funds Transfer in Practice

In practice, funds are not necessarily 'transferred' from one system to another. One system may hold an account in another system (either on its own behalf or on behalf of its participants), which the participants in the first system use to settle payments. The funds, however, are left in the account in the second system during the first system's settlement.

Do you Know?
Funding Liquidity in CHIPS and CLS

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Payment Systems and the Public Sector

Roles of the Central Banks

Central banks play **a number of roles** in payment systems. These roles tend to fall into three different categories: **Provider** of payment systems, **Regulator** of payment systems and **User** of payment systems.

Provider

- Operator/Owner
- Settlement Institution

Regulator

- Overseer/Supervisor
- Catalyst/Facilitator

User

- User

Click each role for more information.

Overseer/Supervisor

The central bank oversight role is emerging as a key central bank activity. Central banks oversee payment systems (including those which they do not own or operate) by:

- monitoring existing and planned systems
- assessing them against their objectives and, where necessary
- inducing change in their design and functioning with the objective of maintaining their safety and efficiency, thus contributing to the sound functioning of the financial system

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Around the World

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Elements of Large-value Payment System Design

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AROUND THE WORLD

KEYPOINT Large Value Payment Systems play a key role in the financial infrastructure of economies around the world.

COUNTRY

Canada	
France	France
Germany	
Italy	
Japan	
Switzerland	
United Kingdom	
United States	
European Union	
Others	

System Name: Transferts Banque de France
Acronym: TBF
Year of Implementation: 1997

System Name: Paris Net Settlement
Acronym: PNS
Year of Implementation: 1999

For details of each system's name, acronym and year of implementation, click each country.

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Interactive animations, audios, subtitles

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Settlement Methods in Payment Systems

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Settlement Mode

Multilateral Netting

Bank	Settlement Obligations
Bank A	+ 50 (C) + 40 (C) + 50 (B) - 30 (A) - 40 (A) - 50 (A) - 10 (A)
Bank B	+ 30 (A) + 40 (A) + 50 (A) - 50 (A) - 100 (C)
Bank C	+ 10 (A) + 100 (C) - 40 (A) - 50 (A)

Under multilateral netting, each participant settles only its net balance vis-à-vis all other participants. Each participant's settlement obligations are calculated by taking into consideration all the incoming and outgoing payments due from and due to all other participants.

Click Next to continue.

Each participant's settlement obligations are calculated

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SUMMARY Page 1/2

Question	Answer
What is a large-value payment system?	<p>A large-value payment system (LVPS) is an interbank payment system which processes mainly large-value and time-critical payments.</p> <p>Payments related to important financial market activities such as money market, foreign exchange or securities transactions, as well as some commercial transactions are processed through these systems.</p> <p>Most countries have at least one LVPS. Some LVPSs may also settle small-value or retail payments.</p>
What is a SIPS?	<p>A systemically important payment system (SIPS) is a payment system where, if the system were insufficiently protected against risk, disruption within that system could trigger or transmit further disruptions amongst participants or systemic disruptions in the financial area more widely.</p> <p>LVPSs are usually considered SIPS. In some countries, large-value and some retail payment systems might be considered SIPS.</p>
Are there internationally recognised standards for SIPS?	<p>Yes. The Core Principles for Systemically Important Payment Systems (Core Principles), published by the Committee on Payment and Settlement Systems (CPSS), are internationally recognized standards for SIPS.</p> <p>The Core Principles, together with the CPSS/IOSCO (International Organization of Securities Commissions)</p>


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Payment Systems - An Introduction

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Test Yourself

Question 6 of 8

Match each type of payment system risk with its correct description.

The risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter (in exchange for-value systems, the risk is generally defined to include replacement cost risk and principal risk).

The risk that a counterparty (or participant in a settlement system) will not settle an obligation for full value when due

The risk that the inability of one institution to meet its obligations when due will cause other institutions to be unable to meet their obligations when due

The risk of loss resulting from inadequate or failed internal processes, people and systems or from external events

Select your answer(s), then click Submit.

Submit

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- Demo <http://demo.fsiconnect.org/>
- Live version <http://www.fsiconnect.org/>
=> Available by subscription only
- Further information: fsiconnect@bis.org.