

IT Examination Handbook Presentation

Wholesale Payment Systems

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1.

IT Handbook Presentations

Wholesale Payment Systems



Open music

2.

Retail vs. Wholesale Payments



The distinction between wholesale and retail payments, as discussed in the Retail Payment Systems Booklet, is that retail payments tend to be consumer oriented, generating a large number of transactions relatively small in terms of value per transaction.

Wholesale payments, on the other hand, tend to be large in value per transaction and in comparison with retail payments relatively small in terms of the number of transactions generated daily.

3.

Wholesale Payment Examples



While retail payment systems tend to support the needs of individual consumers, activities associated with wholesale payment systems typically support domestic and international commercial

4.

Wholesale Payment Examples

- **Commercial loans**
- **Real estate**
- **Corporate and government securities**
- **Foreign exchange**

activities such as commercial loan and real estate transactions, and financial market related activities including corporate and government securities and foreign exchange transactions.

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5.

Wholesale Payment Examples

Wholesale payment systems also provide final clearing and settlement for a variety of retail payment systems at the end of the business day.

Let's take a look at some figures that may help provide context for the nature of large-value wholesale payment systems.

6.

Fedwire® Services

The Fedwire® Funds Service, one of the large-value funds transfer systems discussed in the booklet, currently handles daily funds transfers valued at approximately \$1.8 trillion.

7.

Fedwire® Services

- **\$1.8**
- **\$3.6 Million per**
- **25 institutions almost 67% of**

This number reflects an average value of about \$3.6 million per funds transfer. Approximately twenty-five financial institutions account for almost sixty seven percent of this funds transfer value typically supporting financial market transactions.

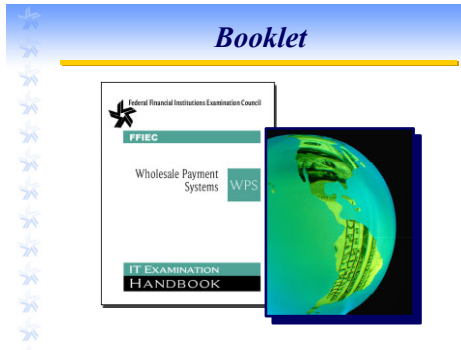
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Participation

Although most financial institutions do not directly participate in the financial markets, all financial institutions participate in various business activities requiring a large-value funds transfer capability, either acting on behalf of their customers or for their own business interests.

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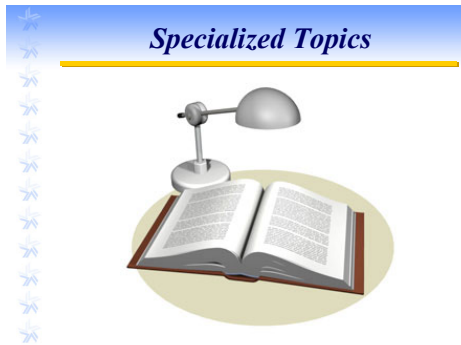
9.



The Wholesale Payment Systems Booklet provides an overview of wholesale payment system activities as they apply to financial institutions when originating, clearing, and settling large-value payments.

Before we look at the booklet's individual sections, it's important to note the "overview" nature of the Wholesale Payment Systems Booklet.

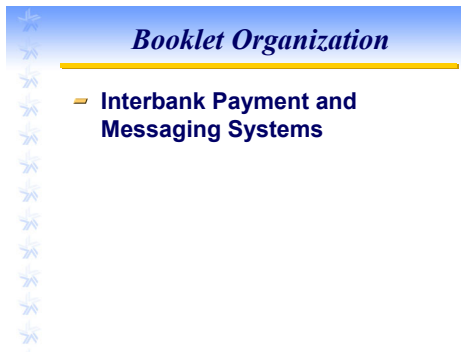
10.



While the booklet and this presentation are intended to offer a concise overview of wholesale payment systems, please keep in mind that many of the topics are specialized in nature and that to gain a more complete understanding will require a review of many of the documents referenced in the booklet's footnotes and appendices.

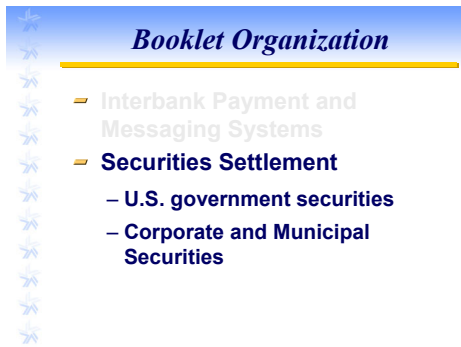
With that in mind, let's look at how the booklet is organized.

11.



The first section of the booklet includes a general description of the various interbank payment systems used for large-value funds transfers.

12.



The second section, *Securities Settlement Systems*, discusses the security settlement systems used for U.S. *Government Securities* and *Corporate and Municipal Securities*. This section focuses on the fact that securities processing within financial institutions and the major markets accounts for the majority of large-value payments.

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13.	<p><i>Booklet Organization</i></p> <ul style="list-style-type: none"> - Interbank Payment and Messaging Systems - Securities Settlement - Intrabank Payment and Messaging Systems 	The third section summarizes the types of internal systems financial institutions use to process large-value payments.
14.	<p><i>Booklet Organization</i></p> <ul style="list-style-type: none"> - Interbank Payment and Messaging Systems - Securities Settlement - Intrabank Payment and Messaging Systems - Wholesale Payment Systems Risk Management 	The final section, <i>Wholesale Payment Systems Risk Management</i> , looks at the risk-management practices financial institutions need to consider in order to secure large-value payment transactions.
15.	<p><i>Booklet Organization</i></p> <ul style="list-style-type: none"> - Interbank Payment and Messaging Systems - Securities Settlement - Intrabank Payment and Messaging Systems - Wholesale Payment Systems Risk Management 	Let's start with the first section of material, which looks at the two primary payment systems used for the interbank transfer of large-value domestic funds.
16.	<p><i>Primary Domestic Systems</i></p> <ul style="list-style-type: none"> - Fedwire® Funds Service - CHIPS <p><i>Electronic Credit Transfer Systems</i></p>	<p>The primary large-value domestic funds transfer systems are:</p> <ul style="list-style-type: none"> ▪ Fedwire® Funds Service and the ▪ Clearing House Interbank Payments System, or CHIPS. <p>Fedwire® and CHIPS are both electronic credit transfer systems.</p>

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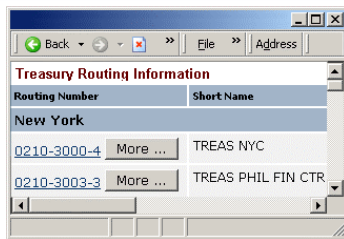
Large-value Payment Systems

- Securities transactions
- Loans
- Real estate transactions
- Large-value, time-critical payments

Generally, these types of systems are used for activities such as:

- Purchasing, selling, or financing securities,
- Disbursing or repaying loans,
- Settling real estate transactions, and
- Making large-value, time-critical payments, such as the settlement of interbank purchases and the sale of Federal funds or foreign exchange transactions.

18.

Fedwire® Funds Service

The first system, Fedwire®, is operated by the Federal Reserve Banks. Fedwire® participants maintain a reserve or securities account with a Federal Reserve Bank. Institutions that do not take deposits are not generally permitted direct access to Federal Reserve payment services. However, these institutions may indirectly use Federal Reserve payment services as customers of Federal Reserve payment services participants.

19.


The Clearing House Interbank Payments System

The second system, The Clearing House Interbank Payments System or CHIPS, is a privately operated multilateral settlement system owned and operated by CHIP Co., a subsidiary of The Clearing House.

20.

The Clearing House Interbank Payments System

The CHIPS network is made up of a small number of funding participants, primarily large U.S.-chartered financial institutions that settle end-of-day balances between each other, and a larger number of non-funding participants who maintain accounts with one of the funding institutions.

	Visual	Narrative
21.	<div style="background-color: #4a86e8; color: white; padding: 5px; text-align: center; font-weight: bold;"> <i>The Clearing House Interbank Payments System</i> </div> 	<p>The CHIPS system clears and settles large-value final payments in U.S. dollars and in real time, handling over two hundred and fifty-seven thousand payments a day, with a gross value of over \$1.3 trillion.</p> <p>The Wholesale Payment Systems Booklet provides a general description of how the CHIPS system works and the interbank-compensation rules that govern some parts of its operations.</p>
22.	<div style="background-color: #4a86e8; color: white; padding: 5px; text-align: center; font-weight: bold;"> <i>Interbank Payment and Messaging Systems</i> </div> <ul style="list-style-type: none"> – Fedwire® and CHIPS – Other Clearinghouse, Settlement, and Messaging Systems <ul style="list-style-type: none"> – NSS – SWIFT – Telex-based messaging – CLS Bank 	<p>The Interbank Payment and Messaging Systems section also describes four other approaches to settling wholesale transactions:</p> <ul style="list-style-type: none"> ▪ National Settlement Service or NSS; ▪ SWIFT, the Society for Worldwide Interbank Financial Telecommunication; ▪ Telex-based Messaging Systems; and ▪ CLS, the Continuous Linked Settlement Bank. <p>Like Fedwire, the National Settlement Service is operated by the Federal Reserve Banks. However, NSS only serves organizations participating in private-sector clearing arrangements.</p>
23.	<div style="background-color: #4a86e8; color: white; padding: 5px; text-align: center; font-weight: bold;"> <i>NSS Membership</i> </div> <ul style="list-style-type: none"> – Local check clearinghouse associations – Automated clearinghouse networks – Credit card processors – Automated teller machine networks – Funds-transfer and securities-transfer networks 	<p>There are about seventy NSS participants, including local check clearinghouse associations, automated clearinghouse networks, credit card processors, automated teller machine networks, and national and regional funds-transfer and securities-transfer networks.</p>
24.	<div style="background-color: #4a86e8; color: white; padding: 5px; text-align: center; font-weight: bold;"> <i>Interbank Payment and Messaging Systems</i> </div> <ul style="list-style-type: none"> – Fedwire® and CHIPS – Other Clearinghouse, Settlement, and Messaging Systems <ul style="list-style-type: none"> – NSS – SWIFT – Telex-based messaging – CLS Bank 	<p>The Society for Worldwide Interbank Financial Telecommunication, or SWIFT, facilitates international exchange and settlement transactions.</p>

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25.

Domestic vs. International

International funds transfer frequently operates differently than large-value domestic funds transfer systems such as CHIPS. International transactions often transmit only instructions to move funds and do not actually complete the transaction itself.

26.

SWIFT

SWIFT messages can be used to transmit payment instructions for either domestic or international transactions.

27.

SWIFT

Functioning as an industry-owned cooperative, SWIFT supplies secure, standardized messaging services to some 7,500 financial institutions in 199 countries.

28.

Interbank Payment and Messaging Systems

- Fedwire® and CHIPS
- Other Clearinghouse, Settlement, and Messaging Systems
 - NSS
 - SWIFT
 - Telex-based messaging
 - CLS Bank

Financial institutions that do not have access to SWIFT can use Telex-based messaging systems for large international transactions.

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29.

Telex-based Messaging

- Dial-up connections
- Dedicated lines



Private telecommunications companies offer a variety of proprietary Telex-based messaging systems, using either dial-up connections or high-speed dedicated lines.

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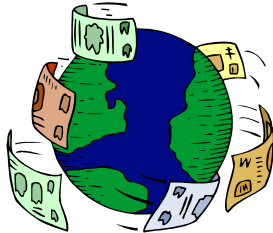
Interbank Payment and Messaging Systems

- Fedwire® and CHIPS
- Other Clearinghouse, Settlement, and Messaging Systems
 - NSS
 - SWIFT
 - Telex-based messaging
 - CLS Bank

The Continuous Linked Settlement, or CLS, Bank is a special-purpose bank that provides organizations a way to settle international payments requiring foreign exchange services.

31.










CLS Bank



The delay between the time that a payment is made and the time the corresponding payment is actually received increases the risk in foreign exchange transactions. The CLS service is designed to eliminate this particular type of risk by offering a means for organizations to process both sides of the exchange simultaneously.




32.

CLS Bank

 Singapore	 Switzerland	 Australia
 Denmark	 U. S.	 Canada
 Norway	 Sweden	 Japan
 England	 European Central Bank	

Customers may join CLS Bank as either a Settlement Member or User Member. Settlement members have accounts with CLS Bank and must sponsor User Members, which do not maintain accounts with CLS.

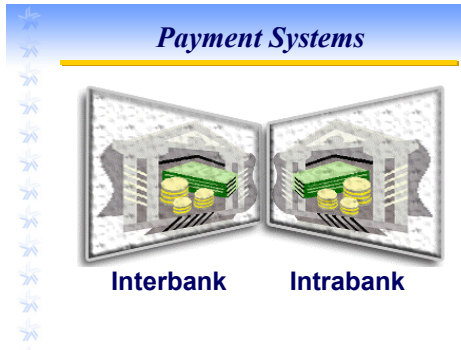
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33.	<p style="text-align: center;"><i>Booklet Organization</i></p> <ul style="list-style-type: none"> – Interbank Payment and Messaging Systems – Securities Settlement <ul style="list-style-type: none"> – U.S. Government Securities – Corporate and Municipal Securities 	<p>The second section of the booklet, Securities Settlement, discusses two types of systems:</p> <ul style="list-style-type: none"> ▪ U.S. Government securities and ▪ Corporate and municipal securities.
34.	<p style="text-align: center;"><i>U.S. Government Securities</i></p> 	<p>The U.S. government securities market encompasses transactions for securities issued by the U.S. Treasury, certain federal government agencies, and federal government-sponsored enterprises.</p>
35.	<p style="text-align: center;"><i>U.S. Government Securities</i></p>  <ul style="list-style-type: none"> • Brokers • Dealers • Investors 	<p>Trading in government securities is conducted over-the-counter between brokers, dealers, and investors.</p> <p>The booklet also describes two other mechanisms that support the selling and trading of U.S. government securities, the:</p>
36.	<p style="text-align: center;"><i>U.S. Government Securities</i></p> <ul style="list-style-type: none"> – Fixed Income Clearing Corporation <ul style="list-style-type: none"> – Ginnie Mae – Fannie Mae – Freddie Mac – Fedwire® Securities Service 	<ul style="list-style-type: none"> ▪ Fixed Income Clearing Corporation, which processes securities issued by the Government National Mortgage Association, Federal Home Loan Mortgage Corporation, and Federal National Mortgage Association, and the ▪ Fedwire® Securities Service, which serves as a securities depository for all marketable U. S. Treasury securities.

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37.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Securities Settlement</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> – U.S. Government Securities <ul style="list-style-type: none"> – Fixed Income Clearing Corporation – Fedwire® Securities Service – Corporate and Municipal Securities </div>	<p>In addition to the Federal government, corporations and municipal governments also issue various types of securities, including:</p>
38.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Corporate/Municipal Securities</i></p> <hr style="border: 1px solid yellow;"/>  <ul style="list-style-type: none"> ▪ Corporate equities and bonds ▪ Commercial paper ▪ Municipal bonds </div>	<ul style="list-style-type: none"> ▪ Corporate equities and bonds, ▪ Commercial paper, and ▪ Municipal bonds. <p>These types of securities are traded on both established exchanges and over-the-counter.</p>
39.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Primary Exchanges</i></p> <hr style="border: 1px solid yellow;"/>  <ul style="list-style-type: none"> ▪ New York Stock Exchange ▪ American Stock Exchange ▪ The National Association of Securities Dealers Automated Quotations </div>	<p>In the U.S., the primary established exchanges are:</p> <ul style="list-style-type: none"> ▪ The New York Stock Exchange, ▪ The American Stock Exchange, and ▪ The National Association of Securities Dealers Automated Quotations system.
40.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Corporate/Municipal Securities</i></p> <hr style="border: 1px solid yellow;"/>  <ul style="list-style-type: none"> ▪ Clearing - National Securities Clearing Corporation ▪ Depository - Depository Trust Company </div>	<p>Clearing for corporate and municipal securities is provided by the National Securities Clearing Corporation, which is regulated by the Federal Securities and Exchange Commission.</p> <p>The Depository Trust Company, a member of the Federal Reserve System, is the central depository for corporate and municipal securities.</p>

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41.



Having reviewed the interbank large-value funds transfer systems connecting financial institutions with each other and the financial markets, lets take a look at the intrabank funds transfer process.

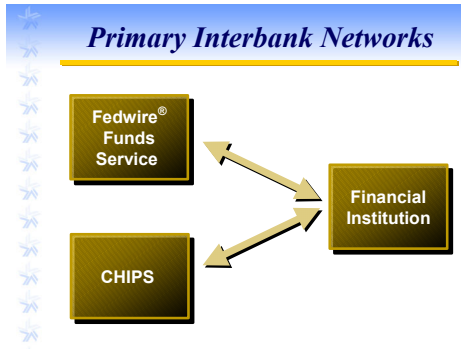
The intrabank funds transfer process covers funds transfer payment orders generated internally within a financial institution and its subsidiaries, and with customers.

42.



These are covered in the *Intrabank Payment and Messaging Systems* section of the booklet.

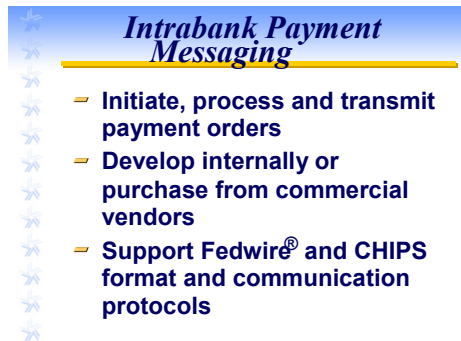
43.



As we discussed earlier in the presentation, there are two primary networks used for the interbank transfer of large-value domestic payments:

- Fedwire® Funds Service and the
- Clearing House Interbank Payments System, or CHIPS.

44.



Financial institutions use intrabank payment and messaging systems to initiate, process, and transmit large-value payment orders internally within the institution and also to interface with the interbank payment networks.


Individual institutions either develop systems internally or purchase them from commercial vendors to establish direct communication with the networks.

In both cases, the software must support strict interface and transaction protocols in order to accurately transmit and receive payment orders.

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45.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Intrabank Payment and Messaging Systems</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> - Payment systems - debit and credit entries - Message systems - administrative instructions </div>	<p>Payment systems transmit actual debit and credit entries, but messaging systems process only the administrative instructions to initiate or process payment orders.</p> <p>If the beneficiary's account is outside the originating institution, the message payment instructions are completed using either Fedwire[®] Funds Service or CHIPS.</p>
46.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Security Concerns</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> - Establish authenticity - Time payment message received <div style="text-align: right; margin-top: 10px;">  </div> </div>	<p>Thus, it is imperative that financial institutions establish the appropriate internal controls over intrabank payment and messaging systems in order to establish the authenticity of incoming and outgoing funds transfers messages and the time of receipt of incoming payment orders.</p>
47.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Security Controls</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> - Limiting access - Controlling access - Assigning access by job functions - Establishing identification and authentication controls </div>	<p>Physical and logical controls surrounding payment messaging systems should include:</p> <ul style="list-style-type: none"> ▪ Permitting access only to staff members who are assigned responsibility for payment messaging systems; ▪ Instituting controls that restrict access to a need-to-know basis; ▪ Assigning access to the application and data, based only as required by functional job duties and requirements; and ▪ Using identification and authentication controls to limit access to the systems.
48.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center;"><i>Secure Operations</i></p> <hr style="border: 1px solid yellow;"/> <div style="text-align: right; margin-top: 10px;">  </div> </div>	<p>Financial institutions should pay special attention to their funds transfer operations.</p>

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49.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center; color: blue;"><i>Secure Operations</i></p> <hr style="border: 1px solid yellow;"/> <div style="border: 1px solid blue; padding: 5px; margin: 5px 0;"> <p style="color: blue;">Wire Room...</p> <ul style="list-style-type: none"> - Originating - Transmitting - Receiving </div> </div>	<p>Often referred to as "the wire room," an institution's funds transfer operation is responsible for originating, transmitting, and receiving payment orders.</p> <p>Whether the wire room consists of one FedLine PC or an entire department using custom funds transfer software, the operation requires appropriate internal controls and management oversight, including the institution's technology infrastructure supporting "the wire room."</p>
50.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center; color: blue;"><i>Booklet Organization</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> - Interbank Payment and Messaging Systems - Securities Settlement - Intra-bank Payment and Messaging Systems - Wholesale Payment Systems Risk Management </div>	<p>These security control issues bring us to the last section of the booklet, which looks at risk management of wholesale payment systems.</p>
51.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center; color: blue;"><i>Risk Management</i></p> <hr style="border: 1px solid yellow;"/>  </div>	<p>The potential for significant loss resulting from the large dollar value of wholesale payments demands extensive financial institution risk management and requires effective and appropriate risk management policies, procedures, and controls be implemented.</p>
52.	<div style="border: 1px solid blue; padding: 5px;"> <p style="text-align: center; color: blue;"><i>Areas of Risk</i></p> <hr style="border: 1px solid yellow;"/> <ul style="list-style-type: none"> - Reputation risk - Strategic risk - Credit risk - Liquidity risk - Legal risk - Operational risk </div>	<p>These practices should be comprehensive and include protection against:</p> <ul style="list-style-type: none"> ▪ Reputation risk, ▪ Strategic risk, ▪ Credit risk, ▪ Liquidity risk, ▪ Legal, or compliance risk, and ▪ Operational, or transaction risk

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53.	<div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #000; margin-bottom: 5px;"> <p style="text-align: center;"><i>Areas of Risk</i></p> <hr style="border: 1px solid #000;"/> <ul style="list-style-type: none"> – Reputation risk – Strategic risk – Credit risk – Liquidity risk – Legal risk – Operational risk </div>	<p>Processing large-value payments can expose financial institutions to a variety of payment system risks. While each of these risks requires significant management attention, this discussion focuses on credit, legal, and operational risk management as examples.</p>
54.	<div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #000; margin-bottom: 5px;"> <p style="text-align: center;"><i>Credit Risks</i></p> <hr style="border: 1px solid #000;"/> <ul style="list-style-type: none"> – Intraday account overdrafts <ul style="list-style-type: none"> – Manage reserve accounts – Comply with FRB PSR Policy </div>	<p>Financial institutions may incur intraday overdrafts in their federal reserve accounts. Financial institutions should manage their reserve accounts and comply with the Federal Reserve Board's Payments System Risk or PSR Policy.</p>
55.	<div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #000; margin-bottom: 5px;"> <p style="text-align: center;"><i>Credit Risks</i></p> <hr style="border: 1px solid #000;"/> <ul style="list-style-type: none"> – Intraday account overdrafts <ul style="list-style-type: none"> – Manage reserve accounts – Comply with FRB PSR Policy – Intraday customer overdraft credit <ul style="list-style-type: none"> – Monitor customer credit position – Control amount of intraday credit – Establish guidelines to enforce limits </div>	<p>Similarly, institutions may allow their corporate and individual customers to incur intraday overdrafts, and should understand that they are in fact extending credit to these customers. As such, institutions should monitor the credit position of their customers; control the amount of intraday credit that's extended to their customers; and establish guidelines to prevent customers from exceeding approved intraday and overnight overdraft limits.</p>
56.	<div style="background-color: #e6f2ff; padding: 5px; border: 1px solid #000; margin-bottom: 5px;"> <p style="text-align: center;"><i>Credit Risks</i></p> <hr style="border: 1px solid #000;"/> <ul style="list-style-type: none"> – Intraday account overdrafts – Intraday customer overdraft credit – Settlement difficulties <ul style="list-style-type: none"> – Unexpected delays – Funding gaps </div>	<p>Additionally, settlement risk is also present when processing wholesale payments. In general terms, settlement risk is the possibility that the settlement of interbank funds or securities transfers will not take place as expected.</p> <p>Such risk includes the possibility that funds may not be transferred or received as expected, exposing the financial institution to potential funding gaps requiring alternative funding sources.</p>

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57.	<p style="text-align: center;">Legal Risk</p>  <ul style="list-style-type: none"> - Office of Foreign Assets Control - Bank Secrecy Act - USA PATRIOT Act 	<p>Management in institutions involved with wholesale payments also should pay special attention to legal risks related to:</p> <ul style="list-style-type: none"> ▪ The Office of Foreign Assets Control, which administers a series of laws imposing economic sanctions against targeted hostile foreign countries and individuals; ▪ The Bank Secrecy Act, which outlines certain record-keeping and reporting requirements; and ▪ The USA PATRIOT Act amendments to the Bank Secrecy Act.
58.	<p style="text-align: center;">Operational Risk</p> <ul style="list-style-type: none"> - Internal and operational controls - Audit - Information security - Business continuity planning - Vendor and third-party management 	<p>Wholesale payments also expose financial institutions to distinctive types of operational risks relating to:</p> <ul style="list-style-type: none"> ▪ Internal and operational controls, ▪ Audit, ▪ Information security, ▪ Business continuity planning, or BCP, and ▪ Vendor and third-party management. <p>Examiners should assure that risk management practices in these areas are appropriate to the level of risk involved with wholesale payment activities.</p>
59.	<p style="text-align: center;">Appendices</p> <ul style="list-style-type: none"> - Examination Procedures - Glossary - Laws, Regulations, and Guidance 	<p>The Wholesale Payment Systems Booklet contains the three standard appendices common in other booklets in the series.</p>
60.	<p style="text-align: center;">Appendices</p> <ul style="list-style-type: none"> - Examination Procedures - Glossary - Laws, Regulations, and Guidance - Legal Framework For Interbank Payment Systems 	<p>In addition to the three standard appendices, the booklet also provides three additional references:</p> <ul style="list-style-type: none"> • Appendix D, the <i>Legal Framework for Interbank Payment Systems</i> looks at overall state and Federal statutes, regulations, and case law that govern payment systems in the United States. This discussion includes reference to the Uniform Commercial Code or UCC, a set of model statutes governing certain commercial and financial activities that has been adopted by all U. S. states.

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61.

Appendices

- Examination Procedures
- Glossary
- Laws, Regulations, and Guidance
- Legal Framework For Interbank Payment Systems
- **FRB PSR Policy: Daylight Overdrafts**

- Appendix E, the *Federal Reserve Board Payment System Risk Policy: Daylight Overdrafts* focuses on daylight overdrafts and how financial institutions can manage their payment activities to limit unsanctioned daylight overdrafts; and

62.

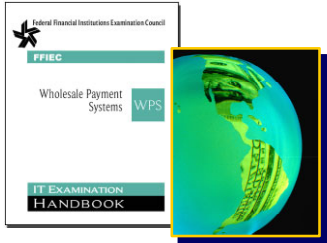
Appendices

- Examination Procedures
- Glossary
- Laws, Regulations, and Guidance
- Legal Framework For Interbank Payment Systems
- FRB PSR Policy: Daylight Overdrafts
- **Payment System Resiliency**

- Appendix F, *Payment System Resiliency*, provides an overview of the *Interagency Paper on Sound Practices to Strengthen the Resilience of the U.S. Financial System*, which identifies sound practices that minimize the immediate systemic effects that result from a wide-scale disruption in critical financial markets.

63.


Conclusion



Examiners and financial institution management will find the Wholesale Payment Systems Booklet provides an introduction to the complex wholesale payment system topic.

64.

Conclusion



The booklet, in describing the participants involved in wholesale payment systems, provides an effective risk management framework, within which examiners can evaluate the internal control environment and compliance with legal and regulatory requirements.