

# **Management of Operational Risks in Foreign Exchange**

The New York Foreign Exchange Committee  
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## Table of Contents

Executive Summary .....	1
Introduction.....	3
Deal/Trade Capture .....	6
Process Description.....	6
Best Practice No. 1: Timely Trade Entry.....	7
Best Practice No. 2: Straight-Through Processing of Transactions .....	7
Best Practice No. 3: Credit Information Available On-line .....	8
Best Practice No. 4: Trading and Operational Practices Should Be Agreed Upon.....	8
Best Practice No. 5: All Market Participants Should Use SSIs .....	9
Best Practice No. 6: Operations Responsibility for Settlement Instructions.....	9
Best Practice No. 7: Review of Third-Party Payments.....	10
Best Practice No. 8: Review of Amendments.....	10
Confirmation .....	11
Process Description.....	11
Best Practice No. 9: Timely Confirmation/Affirmation .....	12
Best Practice No. 10: Expected Settlement Instructions.....	13
Best Practice No. 11: Confirm All Netted Transactions.....	13
Best Practice No. 12: Confirm All Split Trades.....	14
Best Practice No. 13: Confirm All Internal Transactions .....	14
Best Practice No. 14: Timely Resolution of Confirmation Exceptions.....	14
Best Practice No. 15: Identify All Brokers' Switches.....	14
Best Practice No. 16: Review of Reuters Logs and Brokers' Advices.....	15
Best Practice No. 17: Escalation Procedures/Non-confirming Counterparties.....	15
Best Practice No. 18: Automation of the Confirmation Matching Process.....	16
Netting.....	17
Process Description.....	17
Best Practice No. 19: Master Netting Agreements.....	17
Best Practice No. 20: On-line Payment Netting Systems.....	18
Best Practice No. 21: Confirmation of Bilateral Net Amounts.....	19
Best Practice No. 22: Timely Cutoffs for Netting .....	19
Best Practice No. 23: Consistent Operational and Documentation Policies.....	20
Settlement.....	21
Process Description.....	21
Best Practice No. 24: On-line Real-time Nostro Balance Projections .....	21
Best Practice No. 25: Electronic Messages for Expected Receipts.....	22
Best Practice No. 26: Automated Cancellation and Amendment Facilities.....	22
Best Practice No. 27: Timely Payment Cutoffs.....	22
Best Practice No. 28: Reporting Payment Failures to Credit.....	23
Best Practice No. 29: Knowledge of the Settlement Process and Settlement Exposure.....	23
Best Practice No. 30: Crisis Situations Preparation .....	23
Nostro Reconciliation .....	25
Process Description.....	25
Best Practice No. 31: Timely Nostro Account Reconciliation.....	26
Best Practice No. 32: Automated Nostro Reconciliations.....	26
Best Practice No. 33: Identification of Nonreceipt of Payments.....	26
Best Practice No. 34: Operational Standards for Nostro Account Users.....	26

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

Accounting/Financial Control .....	28
Process Description.....	28
Best Practice No. 35: Daily General Ledger Reconciliation .....	28
Best Practice No. 36: Daily Position and P&L Reconciliation .....	29
Best Practice No. 37: Daily Position Valuation .....	29
Best Practice No. 38: Review Trade Prices for Off-Market Rates.....	30
Best Practice No. 39: Straight-Through Processing of Rates and Prices .....	30
General Best Practices.....	31
Best Practice No. 40: Segregation of Duties.....	31
Best Practice No. 41: Understanding Business and Operational Roles .....	31
Best Practice No. 42: Understand Operational Risks.....	31
Best Practice No. 43: Procedures for Introducing New Products .....	32
Best Practice No. 44: Model Signoff/Implementation.....	32
Best Practice No. 45: System Access Control.....	33
Best Practice No. 46: Operational Performance Measures.....	33
Best Practice No. 47: Taped Conversations between Counterparties.....	33
Best Practice No. 48: Strong Independent Audit Group.....	34
Best Practice No. 49: Responsibility for Record Retention.....	34
Best Practice No. 50: Contingency Plans.....	34
Conclusion.....	36
Acknowledgments.....	37
Works Cited.....	38

## Executive Summary

Operational risks can range from a natural disaster, which can cause the loss of a primary trading site, to a difference in the payment conventions on a foreign exchange transaction. It includes such matters as inadequate systems, failure to properly supervise, defective controls, fraud, and human error.<sup>1</sup> Risk has become a major issue for banks as technological advances have compressed the time frame for dealing, thereby necessitating timely risk reporting. Recent market occurrences have also created a particularly strong sentiment for the establishment of strong risk management. Modification of operational procedures and controls are necessary as risk management becomes more challenging in a fast paced market. Failure to adequately manage operational risk can negatively impact P&L, not only resulting from the costs of incorrect settlement of foreign exchange transactions, but also \ managing incorrect positions or taking unknown credit risks. Further, failure to manage operational risk can also harm a firm's reputation and cause a loss of business.

A primary risk management practice is the segregation of duties between operations personnel and sales & trading personnel. Operations personnel, who are responsible for confirmation and settlement must maintain a reporting line independent of sales & trading, where the trade execution takes place. The financial industry has been recently reminded of this very essential control, first with Barings PLC and again with Daiwa Bank. Barings and Daiwa have alerted all organizations to focus intensely on trader and market practices as well as on operational control. These crises have prompted all levels of management to re-examine in their own organizations what they are doing and what they should be doing to minimize risk.

Operational controls are vital to the risk management process. In particular, effective controls help banks detect and resolve problems before they lead to financial loss. Banks have adopted many such controls already, not because of regulatory pressure, but because they have perceived it to be in their best interest to do so. To help banks in their efforts to improve their operational controls, this paper examines all parts of the Foreign Exchange trading process -- trade capture, confirmation, payment netting, settlement, reconciliation, and accounting/financial control -- which are equally applicable to both internal and external trading. It specifically focuses on sources of operational risks in the FX process flow and identifies any gaps and sources of problems. A number of controls are identified as best practices that many market participants are implementing to minimize risk and to create effective risk management. Further, although we believe the controls described here represent best practices in the current environment, we recognize that future experience and innovation will lead to new best practices over time.

This study shows that several prominent best practices or "themes" recur in different segments of the FX process flow. The key themes are:

- separation of duties between sales & trading and the operations group responsible for confirmation and settlement;
- increased understanding of operational risks among management;
- confirmation practices, consistent with the Foreign Exchange Committee's report, ensuring that all trades are confirmed in a timely manner;
- standing settlement instructions that ensure funds will be transferred to the right place;

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

- reconciliation practices that ensure that all discrepancies, be they between the sales & trading and operations, operations and the general ledger, or between the FX participant and its nostro banks, are identified and corrected in a timely manner;
- high quality people who understand the FX process flow and understand how the FX that process impacts the level of risk an institution takes;
- management and exception reporting so that all appropriate people in the organization know about problems in the FX process flow;
- automation, particularly in the form of straight-through processing; and
- on-line global credit line and availability information, including netting status, available to sales & trading around the clock.

The best practices described in this document were compiled after examining current market conditions, regulatory guidelines, and the market practices used by market leaders in foreign exchange. We urge market participants to review these best practices with an eye toward implementing those that can be adopted immediately while actively managing the process to adopt the others as appropriate to their institution.

## Introduction

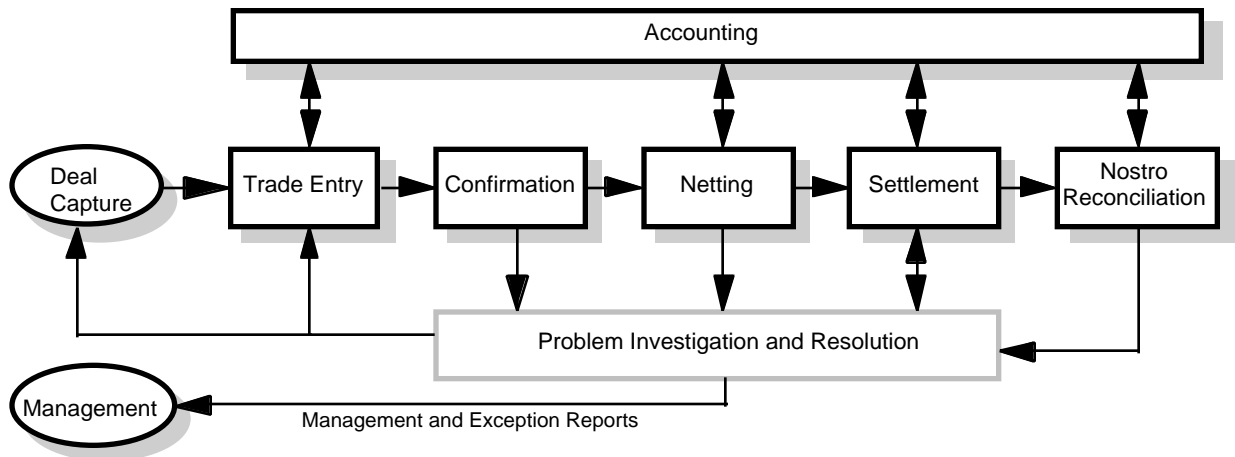
The foreign exchange market is one of the oldest money markets in existence. Banks were the predominant players through its many years of operation. More recently, the foreign exchange market has undergone significant change in both competition and size. Participants now include banks, pension and hedge funds, investment companies, brokers, multinational corporations, as well as other members of the interbank community (“banks”). The value of transactions settled globally each day has risen approximately 1200 percent since 1974 -- from \$1 billion USD to \$1.2 trillion today. Changing market conditions have required foreign exchange users to modify trading procedures, trade capture systems, and alter operational procedures to better manage the risks inherent in the business.

Trading procedures have largely been adopted by market participants over time and not through the publication of specific regulatory documents. A profound change in the foreign exchange market structure has been the new linkages to other markets through the use of and derivatives. Sales & trading system technology has generally kept pace with the expanding number of increasingly complex products and their impact on the foreign exchange market. Equally important is the need for operations, operational technology, and settlement risk management to keep pace with these changes in the market.

Operational risk, unlike credit and market risk, is very difficult to quantify. Clearly, an institution can measure the losses associated with operational errors or resulting from the failure of the operational process to catch errors made in sales & trading. However, determining expected losses and uncertainty surrounding those losses, as most firms do when they measure credit and market risk, is much more complicated. Not only can improper management of operational risk result in compensation payments to counterparts for failed settlement, but they also can lead to larger losses in a firm’s portfolio from managing the wrong position. Further, investigating problems and negotiating a resolution with your counterparty carry additional costs.

The document format provides readers with an overview of the FX process flow; including a detailed description of the trade capture, confirmation, netting, settlement, reconciliation, and accounting processes. Each process description is general enough so that each bank should be able to relate most of the issues to its own operations. A key to successful control within each process step is determining how quickly a bank can identify an exception and resolve it in a satisfactory manner. Similarly, the best practices listed are recommendations that all banks, and indeed, all parties engaging in FX, regardless of institution size should consider adopting for both internal and external transactions. A bank should view the process flow as a series of sequential steps, with appropriate feedback when exceptions occur and escalation procedures to make sure that exceptions are resolved as quickly as possible. A break in the process, especially in the feedback loop, leads to a damaged information flow and increases the potential for financial loss (see figure 1 below). Proper procedures, including escalation and notification, should be in place to deal with problems wherever they occur in the process flow.

**Figure 1 - The FX Process Flow**



The fifty best practices, listed after the description of each step in the process flow, are used, to varying degrees, by the working group members responsible for this paper. Collectively, the working group feels that they represent the practices to which all market participants should strive for. Their implementation would help all to reduce the level of risk in the foreign exchange market. In addition, their acceptance would help reduce operational costs because less time and energy would need to be spent investigating problems. The compilation is meant to provide a checklist for banks new to the market and for existing participants as a tool to review the integrity of their current operating procedures. Each firm is encouraged to define standard operating procedures around the best practices in this document.

The foreign exchange market is not static -- technology continues to advance, volume in emerging nations continues to increase, new exotic structures are continually introduced and many institutions are regionalizing their trading operations and creating smaller satellite offices. All of these trends, and many others, will continue to change the industry, eliminating some risks and introducing new risks. Only when management has a thorough understanding of the current operational process will it be able to fully understand the impact of changes on their ability to manage operational, and other risks.

Throughout this document a number of terms are used which should be clarified for the benefit of all readers.

The term “bank” is used in this document to refer to all market makers in foreign exchange, whether they are commercial banks or investment banks. From a bank's point of view, all deals are done with a “counterparty” which can be another bank or a corporate, institutional, or retail client. However, the concepts in this document are applicable to all market participants.

The term “sales & trading” is used throughout this document when referring to the “front office.” Trading employees execute customer orders and take positions. The traders may act as a market maker, dealer, proprietary trader, intermediary, or end user. A bank may also have a sales force or marketing staff which is part of the front office. Salespersons receive price quotes from the bank's trading staff and represent market opportunities to current and potential clients.

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

The term “operations” is used throughout this document when referring to the “processing”, “settlement”, “back office” or “mid office” areas. Specifically, operations provides a support service to sales & trading.

The terms “nostro bank”, “correspondent bank”, “agent bank” or “clearing bank” are used interchangeably throughout this document. A bank may use the services of one or more affiliated or unaffiliated nostro banks to make and receive payments, or it may act as its own nostro bank. Banks generally use a different nostro bank for each currency that they trade.



## Deal/Trade Capture

### Process Description

The deal capture function signals the beginning of the FX processing flow. Deals may be transacted directly over a recorded phone line, through a broker, over Reuters 2000, or through an electronic matching system (e.g., EBS, Reuters 2000-2, Minex). When deals are transacted through brokers, the name of the counterparty is not revealed until after the deal is executed; therefore the deal is executed subject to credit approval. As long as proper credit lines are available for the counterparty, the deal is finalized. If not, then the broker will try to find a suitable counterparty to sit between the original counterparty and the bank. This practice is known as “switching.”

After the deal is executed, the trader, trader's assistant, or operations staff inputs trade data into the sales & trading system (or writes a ticket to be entered into a bank's operations system). Some deals are done over electronic dealing systems such as Reuters 2000 or EBS, in which case deal information can flow electronically to the sales & trading system. Trade information recorded includes trade date, time of trade, settlement date, counterparty, financial instrument traded and amount transacted, price or rate, netting indicators (to indicate whether the customer is a payment netting customer), and may include settlement instructions. The system used in sales & trading processes this information and can provide "real time" position and P&L updates. Trade information captured in the sales & trading system flows to the credit system where settlement risk and market (also referred to as pre-settlement) credit risk are updated.

Trade information also flows through to the operations system, where it is posted to sub-ledger accounts, and the general ledger is updated as trades are processed. Operations ensures that appropriate settlement instructions have been captured so the required confirmation message may be issued. For interbank, institutional, and corporate counterparties with Standing Settlement Instructions (SSIs) on file, the deal is immediately moved to the confirmation process. However, if no SSIs exist, operations obtains settlement instructions from the counterparty or confirms the settlement instructions received by sales & trading. A SWIFT confirmation message is generated for counterparties who use the SWIFT interbank network; for all others a mail, fax, or telex confirmation is generated (see section on trade confirmation).

Fund managers and investment advisors frequently trade for more than one underlying fund or counterparty at once. Typically, they transact a single “block” or “bulk” trade, which they then “split” into a series of smaller trades as they allocate the block trade to the underlying funds or counterparties. Operations needs to receive split information as soon as possible after the trade is executed and to issue confirmations for each of the split transactions.

Settlement instructions must be obtained for all spot trades. Because forwards are not settled until sometime in the future, operations may contact the counterparty at a later date for settlement instructions. However, the deal's financial details are best confirmed on trade date.

Inaccurate or untimely trade capture can have implications for P&L and risk management for a bank. If a bank does not capture the correct transaction, then its positions and reported credit exposure will be incorrect. Ensuring that the correct settlement instructions, used for paying money to the counterparty, are in place is also an important part of the trade capture process.

### **Best Practice No. 1: Timely Trade Entry**

**All trades, internal and external, should be entered immediately and be accessible for both sales & trading and operations processing as soon as they are executed.**

It is crucial that all trades are entered on a timely basis so that all systems and processes are provided with timely, updated information. No matter how sophisticated the system, if users do not put the information in the system, put it in the system incorrectly, or delay entering the information into the system, then the systems can be superfluous. The interrelated systems and processes that could be affected by deal entry include the following:

- credit;
- intra-day P&L,
- trader positions;
- confirmation processing;
- settlement; and
- general Ledger.

Assuming the counterparty also follows the best practice of sending confirmations, operational controls exist to catch “out-trade” or “no deal” situations (when a counterparty confirms a deal with a bank and the bank's operations has no record of that deal). However, the deal may not be detected until several hours or days after the trade was executed. The P&L impact of managing incorrect positions can be large, especially in rapidly changing market conditions.

A bank's ability to manage risk may be adversely affected by not having accurate transaction updates to each of the above areas. Improper settlement of transactions can hurt a bank's reputation and erode its cash flows because it has to pay compensation costs to the counterparty and cover short cash positions. Incorrect financial statements arising from problems in general ledger data can cause embarrassment to a bank. If credit positions are not properly updated, the bank may be taking on more risk to a counterparty, industry, or country than would be prudent.

Internal trades should be subject to the same degree of diligence as external trades because they carry the same risks, with the exception of credit risk, as external trades.

### **Best Practice No. 2: Straight-Through Processing of Transactions**

**Where sales & trading and operations use separate systems, electronic feeds should automatically feed all deals, adjustments, and cancellations from one system to the other. Ideally the transaction data should also be carried straight-through for posting to the general ledger, updating credit information, generating money transfer instructions, and feeding nostro reconciliation systems.**

In order to ensure timely processing by operations and to eliminate the potential errors that can occur if the trades are reentered into the operations systems, straight-through processing should exist between sales & trading and the operations systems. Such a link should move deals, adjustments, and cancellations to the operations system as soon as they are finalized by sales & trading. This transaction data if also passed straight-through to other systems in the

institution will further eliminate potential errors that can occur when information is manually keyed into systems. This practice also improves the timeliness of the data.

Because more brokered transactions are being executed over automated broking systems, straight-through processing links from these systems into sales & trading should also be implemented.

### **Best Practice No. 3: Credit Information Available On-line**

**Credit lines and usage information should be updated as soon as deals are entered, and they should be made accessible to sales & trading and risk managers. A bank should establish on-line credit systems to calculate and aggregate exposures globally across all trading centers.<sup>2</sup>**

A bank should only be executing transactions if credit lines have been approved and are available for the desired counterparty. In the event of default of a counterparty, a bank could lose the positive market value of the positions they have with the defaulting party or, if in the middle of settlement, could lose the entire principal of the deal (for example, if a bank has already sent money to the counterparty, but has yet to receive the money owed to it because of the time differences between different payment systems).<sup>3</sup> Sales & trading should be able to quickly assess their institution's credit exposure to its counterparties on a global basis. Ideally, these exposures should be communicated on-line to the trading system. The system should automatically update a counterparty's credit status when the counterparty deals with the bank on a global aggregate basis. This requires straight-through processing from the trade capture system to an on-line credit system. Sales & trading should see the effects of a deal on a counterparty's credit status immediately; they should know when a counterparty's credit limit is close to being filled. This knowledge should prevent sales & trading from dealing with counterparties who have reached or exceeded their credit limits. Reports of credit line excesses and exceptions that identify both the counterparties involved, and sales & trading personnel executing the transactions should be produced on a regular basis for sales & trading and credit management.

On-line credit systems also allow a bank's credit office to assess the credit exposure to a counterparty throughout the life of a transaction. Credit officers are better able to manage crisis situations and to adjust limits as the creditworthiness of a counterparty changes. An on-line credit system ensures that any changes in the credit limit of a counterparty (resulting from transactions with the client) are reflected in the sales & trading system immediately.<sup>4</sup>

### **Best Practice No. 4: Trading and Operational Practices Should Be Agreed Upon**

**Trading and operational practices should be established with all counterparties.**

Most banks reach an understanding with all counterparties as to the type of business they will be transacting and how they should be interacting with each other. They should include key operational practices such as providing timely confirmation or affirmation, use of SSIs, and timely notification of splits.

The amount of trading activity with fund managers and investment advisors has escalated in recent years. These clients transact in block or bulk trades which are then split into smaller amounts and entered into specific client accounts managed by fund managers or investment

advisors. Until a block or bulk trade is properly allocated to the specific accounts of each fund entity, inaccurate credit risk management information may exist.

The understanding should clearly establish confirmation and settlement procedures for each counterparty and delineate both the bank's and client's obligations in the process flow. A bank should strongly encourage their clients to confirm bulk trades as soon as possible after the trade is executed and no later than the end of the day on trade date.<sup>5</sup> In addition, a bank should request that fund managers provide them with the "split" information on trade date for all trade types (spot, forwards, swaps, tom/next, etc.) regardless of maturity, so that the bank's credit information can be updated as soon as possible.

### **Best Practice No. 5: All Market Participants Should Use SSIs**

**Standing Settlement Instructions (SSIs) should be in place for all counterparties. All market participants should issue SSIs to each of their trading partners.**

SSIs allow for complete trade details to be entered quickly, so that the confirmation process can begin as soon after trade execution as possible. In general, when SSIs are in place, it is possible to take full advantage of straight-through processing in that operations may not have to a "touch" the transaction during the settlement process. SSIs also allow for payments to be formatted properly and for readable SWIFT codes to be issued. If SSIs are not established, operations must contact the counterparty to obtain settlement instructions and the deal record must subsequently be changed to reflect these settlement instructions. The extra work involved in inputting, formatting and confirming settlement instructions increases the opportunity for errors in settlement, making SSIs important from both a risk management and an efficiency point of view.

Institutions should update their records promptly when changes to SSIs are received from their counterparties. When an institution changes its SSIs, it should try to give as much time as possible to its counterparties so that they can update their records before the date the new SSIs become effective. A bank should consider whether they need to periodically review the SSIs that they have on file.

Because SSIs for forward transactions can change between the time a deal is confirmed and the time it finally settles, a bank should either reconfirm all settlement instructions for forward deals before settlement, or they should reconfirm all outstanding deals whenever SSIs are changed.

SSIs should be in a SWIFT/ISO format to facilitate reference data maintenance and to eliminate the potential for errors in translation.

### **Best Practice No. 6: Operations Responsibility for Settlement Instructions**

**If no SSIs are in place, operations should be responsible for obtaining and verifying the instructions.**

Although standing settlement instructions are preferred, they are not always available, or a nonstandard settlement instruction may be desired. When SSIs are not used, the settlement instructions may be recorded at the time of the deal by sales & trading personnel. These settlement instructions should be checked by operations when the trade is confirmed. Operations' role serves as an independent control on sales & trading activity

### **Best Practice No. 7: Review of Third-Party Payments**

**Extra diligence and review of payment instructions should be in place for all third-party payments.**

In third-party payments, a counterparty requests that the payment of currency be made to a party other than itself. Since the validity of the “other party” is not known to your bank, extreme care should be taken in verifying these instructions. Bank management should be aware of the risks involved with these transactions and should have a clear policy for traders concerning the appropriateness of honoring such requests. In addition, management may want to institute additional controls based on an evaluation of the business being conducted by a given institution.

### **Best Practice No. 8: Review of Amendments**

**Amendments to transaction details should be conducted in a controlled manner that includes both sales & trading and operations in the process. Particular care should be taken for amendments to FX swap transactions, after the settlement of the near leg.**

If incorrect information was captured in deal entry, certain trades will need to be changed or canceled after they have been released to operations. Mistakes occur when a trader or salesperson enters the wrong counterparty for a deal, the wrong value date, the incorrect rate, etc.

Trading is initiated, orders are executed, and positions are taken in sales & trading. Operations records and confirms deals transacted by sales & trading. *This segregation of duties is one of the key control mechanisms of any institution.* Deal amendments and cancellations can be initiated by either operations or sales & trading. The specific process will vary from firm to firm and is often dictated by system constraints. However, both sales & trading and operations should be involved in the process to maintain proper control. If operations is responsible for amending or canceling a deal, it should obtain supporting documentation and receive prior written authorization from sales & trading before processing the amendments or cancellations. Exception reporting on amendments and cancellations should be made available to sales & trading and operations management on a regular basis. The criteria used for reporting the exact contents of the report and the frequency of distribution will vary by firm.

Amendments to swap transactions may present difficulties to a bank if the near leg has settled. When the swap or outright is initially entered into the system, traders cover any resulting currency and interest rate exposure by entering into offsetting deals. The offsetting deals also need to be amended if the swap is entered incorrectly, which may affect P&L. Because the near leg has settled, it cannot be changed to reflect P&L differences. Thus, amendments to swaps should be made with care so that resulting positions and P&L are accurate.

## Confirmation

### Process Description

A confirmation is the record of the terms of a transaction that should be sent out by each party generally on trade date and before the settlement of the transaction. The confirmation process should be independent of the trading room and should be performed entirely by operations. Confirmation data include the following: the parties to the foreign exchange transaction and the offices through which they are acting; the broker (if applicable); the transaction date; the value date; the amounts of the currencies being bought and sold, and by which party; the exchange rate; and settlement instructions.<sup>6</sup> The process varies greatly depending on type of counterparty, method of deal execution or brokerage, and on the level of automation and sophistication available.

For each trade, a confirmation is issued by the bank, and the counterparty either issues its own confirmation or affirms the bank's confirmation. However, the method for communicating confirmations varies depending on the type of counterparty and method of settlement. A bank typically communicates with interbank counterparties through the SWIFT network or via a bilateral netting service. A bank issues SWIFT confirmations on trade date after deal information flows from the sales & trading system to the operations system. SWIFT confirmations are typically received on trade date; their receipt is noted in the operations system. Escalation procedures are initiated after an appropriate time period when SWIFT confirmations are not received. Some institutions now use bilateral netting systems to facilitate confirmation and net settlement. Since these systems must, by their very nature, ensure both banks record the same deal information, they are used for the confirmation process.

Deals executed via electronic trading or matching systems such as Reuters or EBS are confirmed in the same manner as other trades. However, operations may review the Reuters conversation or EBS record to insure that these deals are all recorded in the operations system and that terms of the deal were input properly. This review does not serve as a confirmation of the deal; it only ensures that the deal as executed by sales & trading is properly captured. Because the confirmation process is intended to insure that both parties of a transaction have properly recorded the transaction, including settlement instructions, this check by itself is not sufficient.

Many counterparties still confirm their deals over the phone, a practice called "phone confirmation." Operations calls the counterparty to confirm the deal and a hardcopy confirmation may also be sent by telex, mail, SWIFT, or fax transmissions.<sup>7</sup> Most FX dealers are trying to phase out phone confirmations.

Extra diligence is needed when transmitting fax confirmations because of the risks involved. Fax confirmations may not be received by the correct counterparty if a fax number is incorrectly recorded. Faxed documents also can be replicated, increasing the potential for fraudulent instructions.

Some counterparties are now using electronic deal confirmation systems provided by external services. These systems require both parties to send their deal information to the central confirmation system which then notifies both parties of a match or of a problem in case the deal information does not match. Escalation procedures generally exist to address any problems.

Operations is responsible for monitoring all unconfirmed confirmations and reporting them to sales & trading. Risk in the confirmation process arises when trades are not confirmed. Standard escalation procedures should be in place to pursue and resolve discrepancies. A bank contacts counterparties to inform them of unconfirmed trades and to ensure that the counterparty recognizes the deal.

An unsuccessful match between a confirmation sent and received requires the initiation of escalation procedures to investigate the discrepancy. Most often the discrepancy can be identified by querying sales & trading. However, if problems arise, the tape recording or electronic matching system log can be used to resolve the discrepancy. Once the problem has been identified, the counterparty with the error corrects the deal in their system and re-issues a confirmation so that both parties can agree that the deal is represented in their respective operations systems consistently.

### **Best Practice No. 9: Timely Confirmation/Affirmation**

**A bank should make every effort to send confirmations within one to three hours after deals are executed to all counterparties.<sup>8</sup> Confirmations should be formatted based on trade data captured in the banks system that is responsible for issuing payment instructions and for settling trades. Counterparties should either send out their own confirmations or affirm the confirmations they receive on a timely basis.**

Prompt confirmations are integral to the orderly functioning of the marketplace to minimize risk and prevent fraud.<sup>9</sup> Inefficient confirmation issuance and receipt make it difficult to detect errors that may lead to problems in P&L reconciliation and in statement of position value. All foreign exchange transactions for spot and forward transactions should be confirmed within one to three hours of execution of the transaction.<sup>10</sup> For trades done with clients, a bank should confirm all transactions within three hours of the trade and no later than the end of the business day.

Confirmations should be not only timely but also accurate. Many occurrences of inaccurate confirmations result from the communication mediums used. To this end, the exchange of electronic confirmations should be the first choice of counterparties. Printed confirmations require someone to manually check them. Phone confirmations should be eliminated where feasible. The most desirable way to transmit and match confirms are via the SWIFT network or electronic matching services. Other ways to verify confirmations are, in order of most desirable to least desirable, telex, facsimile, and phone. Because of the tight timeframes for the FX settlement process, mailing of confirmations may not be practical. Particularly on spot transactions, mailed confirmations may not arrive in time to bring problems to light before settlement date. The sooner a problem is identified, the easier and less expensive it is to resolve.

Confirmations done over fax or phone may not be confidential and are more susceptible to transmission difficulties and confirmation matching errors. Because fax transmissions are not secure and are relatively easy to change, there is some question as to whether or not a confirmation sent by facsimile would be legally enforceable. Each bank should consult with their own legal department as to whether or not this is an acceptable practice.

Phone confirmations, in particular, are subject to many problems. The use of FX terminology over the phone may be subject to misunderstanding. Spot could mean two

business days (as in USD/DEM currency pairs) or one business day (as in Canadian deals). Swap transactions are frequently confirmed as the 30th versus 7th (spot and one week). However, a counterparty may believe the deal is for the 30th of June versus the 7th of August (spot and five weeks). Details of a trade are exchanged as "I bought, you sold" one currency versus another. Details may be very confusing--one counterparty buys currency "A" and sells currency "B", while the other sells currency "A" and buys currency "B". Both counterparties must clearly state their position to avoid confirming deals where they both take the same position.

To prevent any of the above events from occurring, institutions active in the foreign exchange market should electronically confirm trades to eliminate the need to confirm deals by phone. A more efficient confirmation process will result. Prompt and efficient confirmation procedures are also a deterrent to unauthorized dealing. Middle market participants who may follow an alternative confirmation process (telephone followed by mail) are encouraged to aggressively pursue the goal of issuing confirmations over a controlled communications medium (electronic or written) and phasing out phone confirmations.

### **Best Practice No. 10: Expected Settlement Instructions**

**A bank should include their own settlement instructions as well as the settlement instructions of its counterparty on confirms. Upon receipt of confirmations, firms should systematically check both parties' confirmations settlements instructions, and ensure that they coincide with those agreed upon at trade capture.**

It is in the best interest of the bank to send the bank's settlement instructions to counterparties. This step provides counterparties with written confirmation of the settlement instructions. Such a practice can help reduce mistakes and the possibilities of fraud.

Likewise, if a bank receives settlement instructions on an inbound confirmation, the bank should check to make sure that the instructions match the agreement. It is better to discover and correct errors in settlement instructions before payment instructions are issued to reduce the incidence of error to both parties.

### **Best Practice No. 11: Confirm All Netted Transactions**

**All transactions, even those that will be netted, should be confirmed individually.**

Netting trades for settlement is an important operational function because it allows a bank to reduce settlement risk and operational cost. However, it is still necessary to confirm all transactions individually. If netted trades are not confirmed individually, trades may be mistakenly added or removed from the net agreement, which will be difficult to detect on settlement day. Incorrect netting will distort credit and settlement risk; it may also cause losses to a bank if it must pay gross amounts instead of netted amounts or if it has to cover overdrafts resulting from incorrect settlement. The confirmation of these deals should be performed like any other transaction or with the aid of a netting service provider.



### **Best Practice No. 12: Confirm All Split Trades**

**All splits should be confirmed by the end of the day on trade date of the transaction.<sup>11</sup>**

A bank should request and strongly encourage fund managers and investment advisors to confirm bulk (or block) trades as soon as possible after the trade is executed (like any other counterparty). For trades with advisors, a bank should identify allocations (splits) to specific client accounts and confirm these split transactions in writing by the end of the business day on trade date. This measure will allow credit systems to be updated as soon as possible.

### **Best Practice No. 13: Confirm All Internal Transactions**

**Internal transactions should be subject to the same procedures as those in place for external clients. Internal counterparties should confirm or affirm transactions as if they transacted a deal with external counterparties.**

Quite often, operations and management relax their control procedures when executing internal deals. In some cases, confirmations are neither sent to the internal counterparty nor affirmed by the receiving internal counterparty. When confirmations are not properly issued and affirmed, trade details are not verified and greater probability of errors results. A bank should recognize that deals done with internal counterparties are not immune to errors. Lack of confirmations will prevent the timely recognition of trade errors, thereby increasing the risk of settlement mistakes or incorrect funding. Owing to these concerns, a bank should issue confirmations and should abide by the standard confirmation process for all internal clients to preserve controls and risk management procedures. If multiple systems are being used by an institution, then the confirmation process should be automated across systems. In those institutions where only one system is being used across internal counterparties, then a process should be set up within that system to insure that both sides of the transaction are properly recorded.

### **Best Practice No. 14: Timely Resolution of Confirmation Exceptions**

**Any exception detected in the confirmation process should be resolved on the day it is discovered.<sup>12</sup>**

Errors that are not rectified immediately will cause continual discrepancies. Also, a bank's exposure to a certain counterparty and currency may increase as time goes by and a dispute is unresolved. Thus, if expected confirmations are not received or unexpected confirmations are received, they should be investigated and resolved immediately. Any other inconsistencies in confirmations should also be resolved within the same time frame.

### **Best Practice No. 15: Identify All Brokers' Switches**

**Broker confirmations should clearly indicate if a brokers' switch has occurred.<sup>13</sup>**

A broker switch occurs when a broker arranges for an intermediary to stand between two parties to a broker-arranged transaction. The broker performs this service when one of the counterparties to a trade refuses to deal with a specific name because of credit issues (e.g., the line is full, or the counterparty is not valid). Because a broker switch introduces a different

party to the transaction, it affects the execution of the confirmation process. Typically with brokers' confirmations, a bank both sends and receives a confirmation with the counterparty, but only receives a confirmation from the broker. It is important that clear documentation exists on all confirmations for trades done as part of brokers' switches. Risk is decreased and a bank will be able to provide supporting evidence of their position if a dispute results.

### **Best Practice No. 16: Review of Reuters Logs and Brokers' Advices**

**Reuters-2000 logs and brokers' advices should not serve as the primary methods of confirmation. They may be used to review trade information, but they should not be the bank's only way to confirm a deal.**

Confirmations are a written statement of all the essential economic terms of a transaction. Reuters-2000 logs are effective ways for operations to review trade information captured in the operations system, and to verify that terms of the deal were input properly. Reviewing Reuters logs only ensures that the deal as executed by sales & trading is properly captured and does not verify that the counterparty captured the correct deal information in its operations system. In addition, as stated in the Deal Capture section, operations should confirm all settlement instructions, so to the extent that the Reuters conversation included settlement instructions, these settlement instructions should be reconfirmed.

It is common market practice for brokers to send their own advices to both parties to a transaction and some institutions rely solely on the brokers advices without sending confirmations to one another. However, as the contract binds the two principals to the transaction, direct and timely confirmations should still be exchanged between the principals. When a firm does not receive a confirmation from a counterparty, then it should ensure to its own satisfaction, through consulting legal counsel, if necessary, that its counterparty is bound to, and in agreement with, the terms of the deal as documented in the broker advice.

### **Best Practice No. 17: Escalation Procedures/Non-confirming Counterparties**

**Escalation procedures should be established to resolve any unconfirmed or disputed deals. A bank should institute other techniques to protect themselves against counterparties who do not confirm transactions. Periodic reports containing the counterparties which do not confirm or affirm and transactions which have not been confirmed or affirmed should be issued to sales & trading and to senior management.**

Unconfirmed deals may indicate something is amiss in counterparty processing. Perhaps the counterparty did not enter the deal (in which case a confirmation would not be generated) or its operations confirmation processing is lagging. More important, it may indicate that the counterparty does not recognize the trade. In addition, repeated problems indicate that the counterparty does not execute operational procedures correctly, a situation that may signal the need for a reevaluation of relations with the counterparty. Unconfirmed deals should be addressed immediately; they can cause many difficulties for trading operations.

Consequently, a bank should adopt standard procedures for addressing unconfirmed deals with clients. These procedures are particularly important if a confirmation is received from an external counterparty, and no record of the deal exists internally. In such a case, escalation procedures require operations to inform the person who executed the deal and desk heads of any unconfirmed deals one day after trade date. Operations also contacts the counterparty and investigates the problem.

Sales & trading should be notified of unconfirmed deals so they know which counterparties may cause settlement problems for the bank. Traders and salespeople will be able to deal more effectively with reputable counterparties and will not engage the bank in excessive risk. Periodic reports should summarize any unconfirmed deals and provide historical information to sales & trading. Senior management should also be knowledgeable of unconfirmed deals so that appropriate counterparty agreements can be established and a review of continued counterparty relationship conducted if warranted.

Standard procedures should also be in place to effectively handle deals done with non-confirming counterparties. Some banks send out periodic statements of any unconfirmed deals. These are sometimes sent for outstanding forward trades even if they are confirmed. Such statements are a good way of reminding management at both the bank and the counterparty that they are both exposed to potential risk from these unconfirmed transactions. A mark to market value, on internal reports, can be used to identify the current size of the risk being borne. These procedures allow a bank to heighten its awareness of risks incurred by dealing with nonconfirming counterparties and to safeguard its operations against the aforementioned risks.

### **Best Practice No. 18: Automation of the Confirmation Matching Process**

**Electronic confirmation matching and tracking systems should be adopted as standard operating procedures.<sup>14</sup>**

Autoconfirmations (or electronic confirmations) are the most reliable method of confirming transactions. They decrease market risk and trade errors, minimize settlement and compensation payments, and decrease operational and overhead costs. Autoconfirmations allow a bank to increase the volume of transactions confirmed in a timely manner; manual confirmations do not create operations that are as efficient.

The confirmation process should be further controlled by establishing an automated confirmation tracking and follow-up system. This system will decrease the chance that deals are not settled properly and will help management track and escalate nonconfirmation. In addition, such a system will enable a bank to identify counterparties that do not confirm on a regular basis so they can be approached. Furthermore, an automated process for tracking faulty confirmations, as opposed to a purely manual one, decreases potential errors caused by human intervention (phone and paper), and reduces operational costs.<sup>15</sup> The cost of these systems is steadily declining to the point where the benefits of automating the confirmation process clearly outweigh the costs of implementing the system.

## Netting

### Process Description

Payment netting is the practice of combining all trades between two counterparties and calculating a single net payment in each currency (this process is sometimes referred to as 'bilateral payment netting' as it takes place between two counterparties). For example, if a bank does twenty-five trades in dollar/yen with the same counterparty all of which settle on the same day, it makes only one or two netted payment instead of twenty-five. The establishment of payments netting between counterparties is useful in reducing settlement risk, operational risk, and operational cost.

For payment netting, netted payments are calculated for transactions done in the same currencies with equal value dates. The bank and counterparty continue to confirm all deals on a daily basis either directly or through a system that helps support bilateral payment netting. These systems allow a bank to view netted amounts of trades on a screen. A summary of netted amounts by currencies and value date appears; subsequent screens identify individual netted trades. The trades that matched and confirmed are shown. Any disputes are investigated and resolved between bank and counterparty operations units.

Operations generally confirms netted amounts on the day before settlement date in addition to confirming the transaction itself on trade date.

The operational process of payment netting should be supported by a legal agreement. This agreement may be a simple one-page agreement that only supports payment netting, or it may be included in a Master Agreement incorporating close-out netting of any unsettled contracts at the time of default.

### Best Practice No. 19: Master Netting Agreements

**A valid Master Agreement should be signed with each counterparty. The Master Agreement should contain payment netting and “close-out” netting clauses to protect against counterparty default.**

Netting agreements allow a bank to decrease credit exposures, to increase business with existing counterparties, and to decrease the need for credit support of counterparty obligations.<sup>16</sup> These benefits arise because a bank using payment netting settles a bulk amount of trades with only one payment instead of settling each trade individually with multiple payments. Consequently, payment netting decreases operational risks to the bank in addition to reducing settlement credit risk. Because of the benefits of payment netting agreements, it is in the bank's best interest to institute netting through the use of legally enforceable documents. A bank may also want to provide for close-out netting in their netting agreements to reduce their market risk in the event of default.<sup>17</sup> The “close-out” provision has an additional beneficial balance sheet effect under FASB interpretation 39, allowing the netting of assets and liabilities in the Unrealized Gains and Losses account if legally enforceable.

The establishment of one master agreement provides risk reduction in the event of counterparty default. The agreement should clearly define the terms under which netting occurs, the method of calculating exposure, and the process by which the agreement will be initiated. When a counterparty defaults, it may demand payment on all contracts that are in-

the-money to it and refuse to pay on those where it is out-of-the-money. If the defaulting counterparty takes this action, the non-defaulting party may be left with a larger than expected loss. A master agreement ensures the counterparty remains responsible for all existing contracts and not just those it chooses to endorse.<sup>18</sup>

Master netting agreements can also provide language that supports the best practice of payment netting. Payment netting gives greater certainty that transactions netted together for payment purposes will not be treated as if settled gross if a bankruptcy occurs during settlement. However, in order to get that protection the trades must actually be settled on a net basis.

The following netting agreements have been developed as market standards. They have provisions that should satisfy relevant accounting and regulatory standards so long as a legal opinion is able to conclude the agreements are legally enforceable in the relevant jurisdictions.

- ISDA Master Agreement (1987 or 1992 version)
- IFEMA Agreement covering spot and forward currency transactions
- ICOM Agreement covering currency options

Master Netting agreements contain the following features: appropriate events of default, including default upon insolvency or bankruptcy; a clause that states that if a default occurs the bank should be entitled to immediately close out all covered transactions; a clause that details a single net obligation should result (from the closing out and netting of unrealized gains and losses) that is either payable or receivable; and an optional clause to support payment netting.

Before the benefits of close-out netting can be achieved, the Master Agreement must be signed by both parties. To realize the payment netting benefits, however, the operations unit must commence settling on a net basis. Therefore, it is essential that they receive a copy of the agreement or are notified accordingly of the terms of the executed agreement.

Firms should confer with local counsel to ensure enforceability of the netting provisions. To the extent there are any unenforceable provisions, the firm should ensure the severability of those provisions from the core netting provisions.

## **Best Practice No. 20: On-line Payment Netting Systems**

**The use of an on-line payment netting system is encouraged to calculate net payments in each currency. On-line bank software for calculation of netted payments should be used to ensure proper calculations.**

Correct calculations of netted payments are important to preserve client relationships and to establish effective operations. If a bank mistakenly expects a payment of \$2 million from a counterparty but receives \$1 million, it will initiate investigation procedures, and possibly escalation procedures, with the counterparty. Counterparty relations may be damaged should this occur. Faulty netting calculations also create an inaccurate assessment of a bank's credit risk with the counterparty.

Because of these risks, a bank should invest in on-line software to calculate netted payments. A bank will be able to effectively communicate netted payment amounts. Both counterparties will enter deal information into the trade capture system; the system will confirm the

transactions, and will calculate, on a currency by currency basis, the net amount due to each counterparty. The two counterparties to the transaction will be notified if these amounts are not equal, and the resulting discrepancy may be resolved immediately.

Payment netting should be used because it reduces currency exposure. If a bank does ten deals (within the same currency) with a counterparty, it will only experience a currency exposure for two netted amounts (one for the amount it is paying and one for the amount it is receiving) and not for twenty different amounts. When any additional trades are done, the resulting exposure is added to the net exposure. The advantages to using such a system are that it allows for quick recognition and correction of netting errors, thereby allowing for effective management of settlement risk. Recently, there has been a lot of discussion of multilateral payment netting and payment versus payment (PVP). Multilateral payment netting occurs across counterparties whereas bilateral payment netting only occurs with one counterparty. PVP seeks to eliminate settlement risk by making sure that 'if you pay, you will get paid'. Because multilateral payment netting and PVP further reduce settlement exposure, they should be explored as they become commercially available.

### **Best Practice No. 21: Confirmation of Bilateral Net Amounts**

**Final amounts should be confirmed bilaterally with the counterparty if they are not done electronically.**

Electronic payment netting systems inform both bilateral parties of the amount that they each owe and can expect to receive at some predetermined cut-off time. However, if electronic payment netting systems are not used, then it is possible that the calculations performed by one party's operations may contain an error. To protect against an improper settlement of a net amount, the parties should confirm the net payment amount with each other at some predetermined cut-off time.

### **Best Practice No. 22: Timely Cutoffs for Netting**

**A bank should adopt the latest cutoff possible for confirming netted trades. Credit system functions should be in place to accurately reflect the effect of netting.**

To include all transactions done between two counterparties and to have the maximum risk reduction, the net payment amounts should be confirmed at the latest possible time. This measure will allow trades done for settlement on the trade date to be included in the net amount. As netting occurs and other trades are done with the counterparty, credit systems should be updated. Credit systems should be adapted to account for legally enforceable netting agreements and should reflect changes in line usage appropriately. This allows sales & trading to appropriately deal with counterparties based on available credit and to gauge risk associated with each deal. Deals that miss the netting cut-off should be settled gross and reflected as such for credit purposes.

### **Best Practice No. 23: Consistent Operational and Documentation Policies**

**Management should ensure that credit and documentation policies are consistent with operating practices. Credit systems should not reflect payment netting benefits unless documentation exists to support netting and settlement with counterparties occurs on a net payment basis.**

Sometimes operational practices do not coincide with those outlined in documented policy: the trade capture system may not indicate netting counterparties, preventing the bank from realizing the benefits of netting; a bank may practice netting, though a formal agreement is not established with the counterparty; or a counterparty who has agreements in place asks to settle gross at the last minute. A bank which is caught in a legal dispute will not be able to justify its practices without legal and operational support which may cause unexpected losses to the bank. Further, this may have the opposite effect than intended -- settlement and credit risk for the bank may be greater as well as prevent the bank from effectively managing their position risk. To this end, operations management should strive to establish policies which are aligned with operational goals and follow documented procedures. Management should be sure that operational procedures ensure netting is carried out between a bank and designated counterparties. Operations should ensure netted trades are reflected in trade capture systems and credit systems so that netting is successfully executed. The operational procedures should include any necessary cut-off times, SSIs, and agreed method of confirmation/affirmation and should be supported by the documentation with the counterparty.

## Settlement

### Process Description

Settlement is the exchange of payments between counterparties on value date. The settlement of foreign exchange transactions can involve the use of various secure international and domestic payment system networks.

Settlement occurs and payments are exchanged after the trade is done, on the value date of the transaction. For counterparties that are not settled on a net basis, payment instructions are sent to nostro banks for all the amounts they owe, as well as expected receipts, one day before settlement. Systems generate predictions of expected movements in nostro accounts to help manage liquidity and to help reconcile actual cash movements against the nostro accounts.

All payments are exchanged through the aforementioned nostro accounts. These accounts are denominated in the currency of the country where they are located. For example, when a bank enters into a contract to buy dollars and sell DM, it will credit its nostro DM account and debit its nostro dollar account. The counterparty credits its nostro dollar account and debits its nostro in Germany. A money transfer is initiated by both banks to pay the opposing counterparty and a funds movement occurs between two banks through the local payment system. A bank may use more than one nostro bank abroad for the payment or receipt of a currency. To avoid overdraft charges a bank ensures the flow of funds does not leave one account in overdraft while another has excessive balances. The money transfer is complete when both counterparties have been paid the appropriate amounts.

Settlement errors are typically quite costly; failure to make delivery of payment generates unnecessary expense to a bank because it has to pay compensation to its counterparty. Settlement errors may cause a bank's cash position to be different than expected.

Settlement Risk, the risk that a bank makes its payment but does not receive the payment it expects, can cause a large loss. This risk arises in FX trading because payment and receipt of payment often do not occur simultaneously. A properly managed settlement function reduces this risk. Settlement Risk is measured as the full amount of the currency purchased and is considered at risk from the time a payment instruction for the currency sold becomes irrevocable until the time the final receipt of the currency purchased is confirmed.<sup>19</sup> Sources of this risk include internal procedures, intra-market payment patterns, finality rules of local payments systems and operating hours of the local payments systems when a counterparty defaults. Settlement risk may have significant ramifications and is controlled through the continuous monitoring of the bank's nostro balances and through the establishment of counterparty limits. A maximum settlement risk limit is usually established for each counterparty.

### Best Practice No. 24: On-line Real-time Nostro Balance Projections

**Nostro balance projections should be made on a real time basis and should incorporate the latest trades, cancellations, and amendments.**

A bank is exposed to risk when managing nostro funding if their expected cash positions vary greatly from actual cash positions. If more cash is needed than the balance in an account, the bank will incur overdraft costs to fund the positions. Continual overdraft balances will



generate expenses to the bank and may cause operational difficulties in trying to determine why errors occurred.

### **Best Practice No. 25: Electronic Messages for Expected Receipts**

**A bank should send their nostro banks an electronic message that communicates its expected receipts, provided the nostro bank can process and add value with this information.**

With the receipt of an electronic message advising of expected receipts, nostro banks can identify payments that are directed to an incorrect account early in the process. This allows nostro banks to correct payment errors on a timely basis and to aid in the formulation of escalation procedures. This process can help a bank to receive the exact funds they expect and to eliminate unmatched or unreceived payments. Some nostro banks will take the transaction reference number from an incoming electronic message and put it on their outgoing nostro activity statement.

Some nostro banks are not equipped to process these “expected receipt messages”. Given the benefits that accrue through the use of expected receipt messages, a bank should consider a nostro’s ability to process them in its decision as to which nostro bank to use.

### **Best Practice No. 26: Automated Cancellation and Amendment Facilities**

**A bank should establish an automated interface to their nostro banks; nostro banks should maintain on-line capabilities for the cancellation and amendment of payment instructions.**

A bank may have a need to change or cancel payment instructions after they have been released to nostro banks. Problems may arise if this information is not processed or not processed in a timely manner. Amendments occur because an error in the original instruction has been identified or a counterparty has made a last minute change. Because execution of the erroneous payment instruction will most certainly create an improper settlement, the bank needs to be sure the amendment is acted upon so that its nostro balance predictions are accurate. More important, a bank may wish to cancel a payment instruction if it is reasonably confident that a counterparty may not fulfill its obligation to pay it the countercurrency. An automated feed from the operations system to the nostro bank should make communication of amendments and cancellations easier. Nostro banks should be able to establish later deadlines for payment amendments because a real time link provides more time to process the changes. The link also decreases the chance that a bank will miss the deadline and should prevent incorrect payments from being released.

### **Best Practice No. 27: Timely Payment Cutoffs**

**Management should work to achieve the latest possible cutoff times for cancellation and alteration of payment instructions to nostro banks as well as the earliest possible times for confirmation of final receipts.<sup>20</sup>**

Eliminating restrictive payment cancellations deadlines and shorting the time it takes to identify the final and failed receipt of currencies, a bank can lower its actual and potential settlement exposure. A bank should understand when they can unilaterally cancel or amend a payment instruction and negotiate with the it nostro banks to make this cutoff as late as

possible. In addition, it gives a bank more control over its payments, allowing them to react to any problems that arise late in the settlement process.

### **Best Practice No. 28: Reporting Payment Failures to Credit**

**Operations should ensure credit reporting appropriately updates settlement exposure resulting from projected cash flow movements and should include any failed receipts from previous transactions.**

To properly manage its credit risks, a bank needs to monitor settlement exposure to each of its counterparties. Settlement exposure exists for a foreign exchange transaction from the time that the payment instruction issued by the bank is no longer unilaterally revocable by the nostro bank to the time that the bank knows it has received the counter-currency from the counterparty.<sup>21</sup> Therefore, credit officers need to know the projected settlement amounts with each counterparty. In addition, any nonreceipts should be included in current exposure amounts reported to the credit officers as they indicate an increased exposure to the counterparty until the amount has been paid, and may indicate a more serious problem at the counterparty.

### **Best Practice No. 29: Knowledge of the Settlement Process and Settlement Exposure**

**All senior managers should obtain a high level understanding of the settlement process. Additionally, both credit and risk managers (those managing position risk and credit risk) should be cognizant of the impact of their internal procedures on settlement exposure.<sup>22, 23</sup>**

Settlement risk may be reduced if those involved in the process better understand the ramifications of its possible failure. Senior management, sales & trading, operations, risk management, and credit management should understand the process and be aware of the timing of key events in the process -- when payment instructions are recorded, when they become irrevocable, and when confirmation of counterparty payment is received with finality. Knowledge of these items allows the duration and value of foreign exchange settlement exposure to be better quantified.<sup>24</sup>

Both credit and risk managers should develop accurate methods to quantify settlement risk. A bank's actual exposure when settling a foreign exchange trade equals the full amount of the currency purchased and lasts from the time a payment instruction for the currency sold can no longer be canceled unilaterally until the currency purchased is received with finality.<sup>25</sup>

### **Best Practice No. 30: Crisis Situations Preparation**

**Operations employees should understand the procedures for crisis situations affecting settlement. They should know who to notify if payments must be canceled or if settlement procedures must be changed.<sup>26</sup>**

Crisis situations (such as a failure of the bank's settlement processing systems, potential bankruptcy, or the outbreak of war) present critical decisions for a bank. Firms should anticipate crises and prepare internally. A bank's failure to settle properly with counterparties could prove harmful if a counterparty defaults on the expected payments. Consequently, operations should know precisely what is to be done in a crisis. Current nostro bank staff

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

contact lists should be distributed. Operations should understand alternative settlement procedures and how they are executed. Operations staff should know who should be informed and how to inform them of changes or cancellations in payment instructions. A bank may wish to consider simulated exercises of crisis situations to ensure employees are familiar with alternative procedures. In this manner, crisis situations can be dealt with effectively.

## **Nostro Reconciliation**

### **Process Description**

The nostro reconciliation occurs at the end of the trade settlement process to ensure a trade has settled properly and that all expected cash flows have occurred. A bank should begin reconciliation as soon as it receives notification from their nostro bank that payments are received. If possible, reconciliation should be performed before the close of the currency's payment system enabling the bank to detect any problems in cash settlement and resolve them on settlement date. Typically however, a bank does not receive notification from its nostro banks until one day after settlement, which doesn't allow them to correct any payment errors on settlement date.

Reconciliation begins with the prediction of cash movements. The bank's operations identify those trades that are for value the next business day. Operations aggregate all payments for that value date taking into account netted payments and determine what the expected cash movement will be for each of its nostro accounts. This allows the bank to accurately fund its nostro accounts.

The main objective of the Nostro Reconciliation function is to ensure that expected cash movements agree with the actual cash movements of currency at the nostro bank. This involves a comparison of expected cash movements and actual cash movements both paid out and received in by the nostro bank. If the reconciliation indicates a difference from expected amounts there are six possible reasons. A bank;

1. expects to receive funds and does not;
2. expects to receive funds and receives the wrong amount;
3. receives funds and did not expect to receive them;
4. expects to pay funds and does not;
5. expects to pay funds and pays the wrong amount; or
6. pays funds and did not expect them to be paid.

If any differences exist the bank must follow-up with the nostro bank and/or the counterparty to resolve the discrepancy. The cause for the difference might be that wrong settlement or trade information was captured, or that the nostro bank made an error. Most of these errors can be avoided if the confirmation process is followed without exception. If the discrepancy was caused by an error at the bank, then the bank must arrange to pay the counterparty with good value or to pay the counterparty compensation. Likewise, if the error occurred at the counterparty or at the nostro bank, then the bank should expect to receive good value or compensation.

If the nostro reconciliation is not performed, or is performed incorrectly, then the balances at the nostro bank will be different from what the traders believe they are funding, with the result that the bank will be paying overdraft costs on any short balances or receiving less than market rates on any long balances. In some currencies, the central banks have penalties for carrying short balances in addition to the overdraft charges due. Failure to notify counterparts of problems in a timely manner may lead them to dismiss claims that are over a certain age, causing the bank to absorb the overdraft costs.

### **Best Practice No. 31: Timely Nostro Account Reconciliation**

**Full reconciliation should be completed as early as possible.<sup>27</sup>**

A bank should attempt to establish capabilities that allow for intra-day processing of nostro confirmations of receipts, thereby allowing the reconciliation process to begin before the end of the day, but in no instance should the reconciliation be done later than the day following settlement date. The sooner reconciliations are performed, the sooner a bank knows its true nostro balances so it can take appropriate actions to ensure that its accounts are properly funded. In addition, nonreceipt of funds may indicate credit problems at a counterparty. The sooner this information is known, the sooner a bank can prevent further payments being made to that counterparty.

### **Best Practice No. 32: Automated Nostro Reconciliations**

**A bank should be capable of receiving automated feeds of nostro activity statements and implement automated nostro reconciliation systems.**

A bank should establish facilities for automatically downloading the settlement information they receive from nostro banks as well as their own expected settlement data. A bank should establish an electronic reconciliation system to compare these two streams of data (confirmed payments and receipts from the nostro bank against the expected cash movements from the operations system) to allow for the timely identification of differences. Escalation procedures should be in place to deal with any unreconciled trades and/or unsettled trades. These procedures should be initiated when settlement and/or nostro reconciliations are not successful.

### **Best Practice No. 33: Identification of Nonreceipt of Payments**

**Management should establish procedures for detecting nonreceipts of payments and for notifying appropriate parties of these occurrences.<sup>28</sup> Escalation procedures should be in place for dealing with counterparties who fail to make payments.**

A bank should attempt to identify, as early in the process as possible, any expected payments that are not received. They should be prioritized by counterparty credit ratings, payment amount and currency, or by an internally generated counterparty watch list. All failed receipts should be subject to established follow-up procedures. A bank should also report nonreceipts to credit management and to sales & trading, particularly for any recurring failures with one particular counterparty. Management may wish to consider a limited dealing relationship with counterparties who have a history of settlement problems and continue to fail on their payments to the bank. Payment of interest and penalties should be prompt.

### **Best Practice No. 34: Operational Standards for Nostro Account Users**

**A bank should require all other users of its nostro accounts to comply with the same operational standards as foreign exchange users.**

The foreign exchange department of a bank may be the primary user of nostro accounts. However, other business groups (i.e. fixed income, commodities, emerging markets,

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

derivatives, etc.) may also be users. Clear procedures should be established outlining how each account is funded (i.e. whether individual or group funding exists). Consistent standards should be in place describing the necessary operating procedures that all users should follow. Without clear rules for sharing in place, the bank runs the risk of overdraft problems.

## Accounting/Financial Control

### Process Description

The accounting function ensures FX transactions are properly recorded to the balance sheet and income statement. If transaction information is not recorded correctly, it could damage a bank's reputation by resulting in material restatements of financial accounts.

Accounting entries are first booked following the initiation of a trade. At this point, details of the deal are posted to contingent accounts (typically in a system used by operations). At the end of each trade day, all sub-ledger accounts flow through to the general ledger. In some banks, the sales & trading system compiles all of this data and develops a P&L figure for business done that day. Operations later verifies this figure's validity. Other banks calculate two P&L figures independently; one is done by sales & trading, and one is calculated by the operations system. Both P&L figures are verified by an independent party. On the next morning, the P&L of the prior day's business is verified by the financial management function and analyzed by senior management.

After initial entry of a trade into the general ledger, the position is continually marked to market until it is closed out. Daily marking to market calculates unrealized gains and losses on the positions feeding the general ledger and the daily P&L. Once the position is closed-out, realized gains and losses are calculated and reported.

All subsidiary ledger accounts (including all brokerage accounts and suspense accounts) are reconciled to the general ledger on a daily basis. Additionally, on a monthly basis (usually at month-end) an independent check is done to ensure that all subsystems accounts reconcile to the general ledger accounts. All discrepancies are investigated as soon as possible to ensure the bank's books and records reflect accurate information. In addition, all discrepancies that have an impact on how the bank reports gains or losses are reported to senior management.

Cash flow movements that take place on settlement date are also posted to the general ledger in accordance with accepted accounting procedures. The receipt and payment of expected cash flows at settlement are calculated in a bank's operations system. There are times when cash flows must be changed because of trade capture errors, which require changes to a sub-ledger account. Accounting entries are modified so the general ledger accurately reflects business activities; the change flows to the operations system where appropriate cash flow adjustments are made.

### Best Practice No. 35: Daily General Ledger Reconciliation

**Systematic reconciliations of the general ledger to the operations system and of sales & trading systems to the operations systems should be done daily.**

Timely reconciliations will allow for prompt detection of errors in the general ledger or sub-ledgers and should minimize accounting problems. This reconciliation will ensure the general ledger presents an accurate picture of an institution's market position. When problems are detected, they should be resolved as soon as possible. Senior management should be notified of accounting discrepancies to review and update control procedures as needed.

### **Best Practice No. 36: Daily Position and P&L Reconciliation**

**Daily P&L and position reconciliations should take place between the sales & trading, and operations systems.**

Position reconciliations allow a bank to ensure that all managed positions are the same as those being settled by operations. This control is imperative when all deal entries and adjustments are not passed electronically between sales & trading, and operations. When straight-through processing is in place, the reconciliation ensures that all deals were successfully processed from sales & trading to operations, along with all amendments. Because a discrepancy in P&L between sales & trading and operations can indicate a difference in positions or market parameters (i.e., rates or prices) all differences should be thoroughly investigated.

Banks that maintain a single system for trade capture data should ensure the data source is properly controlled.

### **Best Practice No. 37: Daily Position Valuation**

**Position valuations should be verified by an independent party; any marking to market procedures used for valuing financial instruments should be communicated to trading management. Banks that are active in less liquid forward markets, or in exotic options markets, should obtain independent valuations from other sources (such as brokers or other banks) if liquid quotes are not available.**

P&L is an integral part of the daily control process; thus, it is important for the calculation to be correct. The appropriate end of day rates and prices that are used to create the position valuations should be periodically checked to an independent source. Either operations or the financial group should check that the rates and prices used by sales & trading for end of day valuation are close to the market rates and that prices can be obtained by independent sources (i.e., from market rates screens, other dealers, and/or broker quotations). In addition, at least once a month, the results of the models should be checked to other dealers and/or brokers to ensure that the valuations produced by the bank's models are consistent with other dealers.

Illiquid markets present additional risk to a bank; illiquid instruments are not frequently traded, making them difficult to price. Often, it is hard for a bank to obtain market quotes, thereby preventing timely and consistent position monitoring. P&L may be distorted and risk may not be properly managed. In such instances, a bank should seek to obtain quotes from other counterparties active in the market. Management should be aware of these procedures so they may effectively manage and evaluate illiquid market positions. These procedures allow a bank to mark to market their positions and to evaluate associated risks. In addition, firms should take a reserve against this price risk.

Marking to market reflects the current value of FX cash flows to be managed and provides information about market risk.<sup>29</sup> Senior management will be able to better manage and evaluate market positions when they know how positions are valued on a daily basis.



**Best Practice No. 38: Review Trade Prices for Off-Market Rates**

**Trade prices should be independently reviewed to ensure reasonableness within the market prices that existed on trade date.**

Any trades executed at prices not consistent with the market rates which existed at the time of execution may result in an error for the bank or may unduly enrich the bank or the counterparty. A daily procedure should be followed that provides for independent manual or automated review of trade prices versus prevailing market rates.

**Best Practice No. 39: Straight-Through Processing of Rates and Prices**

**Rates and prices should be fed electronically from source systems.**

The valuation of positions requires many different rates and prices, sometimes collected from different sources. To eliminate the errors associated with collecting and re-keying the required rates and prices, a bank should establish electronic links from the systems that source the rates and price information to the position valuation systems.

## General Best Practices

### Best Practice No. 40: Segregation of Duties

**Operations personnel should maintain a reporting line independent of sales & trading. Management should also ensure that appropriate segregation exists between key areas within the operations.**

Operations cannot be effective in performing its control functions if its members report to the same people that are being serviced. To implement the controls mentioned in this paper, operations must be able to report any and all problems it encounters to separate senior management.

Having one individual responsible for both the settlement process and the trading process; issuing and authorizing payment instructions; posting and reconciling the general ledger, to name a few, makes it extremely difficult to provide for proper operational controls. It also makes it much more likely that any fraudulent activity will go undetected for some time.

### Best Practice No. 41: Understanding Business and Operational Roles

**All members of sales & trading and operations should understand the various roles played by sales & trading, operations, credit, and the financial group in the foreign exchange process flow, including current operational policies and procedures.**

Operations policies and procedures have changed over the years and continue to evolve; traders may not be knowledgeable of the many policy or procedural changes, nor certain of how trades are processed. In particular, they should have a good understanding of the confirmation and settlement procedures of the importance of correct trade data to ensure successful confirmation, and of the importance of obtaining SSIs to ease settlement to fully appreciate the potential expenses to the bank resulting from processing errors.

Similarly, operations personnel will not be able to adequately support business processes they do not understand. Insufficient knowledge of traded products will prevent a comprehensive understanding of the risks involved and may prevent implementation of effective controls. A bank should provide continuous employee education regarding business processes. Additionally, a team atmosphere should be sought, in addition to maintaining a separation of duties in the workplace.

Banks should also insure that policy and procedure documents are developed and maintained. These documents should be made available to each person in sales & trading and operations.

### Best Practice No. 42: Understand Operational Risks

**A bank should fully understand the operational risks that they take and make appropriate changes to processes or invest in technology to help mitigate these risks.**

As with all risks that a bank manages, it should fully understand the operational risks it is taking. To do this, the entire processing cycle should be understood by management. Areas

of exposure need to be identified, along with some quantification of loss a bank could suffer from a given exposure. With better information regarding operational risks, institutions can make informed decisions about which risks they are going to take and which risks need to be managed either through additional controls or through investment in new technology.

### **Best Practice No. 43: Procedures for Introducing New Products**

**A bank should have proper procedures in place for introducing new products. These procedures should include a provision to ensure the bank has the capability to price, value, and settle the new types of transactions. The bank should also be able to measure and monitor any risk associated with new product introduction.<sup>30, 31</sup>**

When a new product is introduced to a bank, the sales & trading, and the operations areas should be knowledgeable and prepared for both their execution and processing. A new product may introduce different types of risk or increase existing risks. It may also result in different methods of P&L reporting, and new methods for capturing, confirming, netting, settling, and reconciling deals. Changes resulting from new product introduction should be effectively controlled. Proper procedures that detail operational and systems support guidelines for the introduction of new products should be in place. Operations should be able to integrate the new product into the institution's risk measurement and control systems.<sup>32</sup> Employees should be knowledgeable as to how operations will capture, record, confirm and settle trades of new products. Both sales & trading, and operations employees should be informed of new product introductions and of any changes in operational practices.

### **Best Practice No. 44: Model Signoff/Implementation**

**Models often supports trading activities. As a result, their implementation is an important operational function. Implementation procedures should ensure all users properly understand model capabilities and purposes and should provide initial approval for use of models.**

Models may be used to report positions, to manage position risk, and to price financial instruments. New models, or changes to existing models, may change the procedures associated with any of these actions. It is important employees understand how the pricing of certain instruments will change and how position monitoring will be evaluated if a new model is introduced. Direct model risk occurs when models are used to manage a firm's own positions and accounts. Indirect model risk occurs when models are used in support of sales and advisory work and counterparty reporting. Models introduce an institution to both direct and indirect model risk. These risks may be reduced by a smooth and effective implementation of any new models. This care will prevent model difficulties from uneducated users and an interruption of business activities because of mismanaged model risk.

Because operations typically run many of the models used by a bank, the operations personnel should be integrally involved in any new model signoff and implementation. Operations typically will run several tests of the new model to see what impact it would have on positions and P&L, so that they can be explained before the model goes live. Operations should also be involved in assessing which parameters should be used by the models, where proper audit trails are needed, and must adopt their procedures before the model goes live.

### **Best Practice No. 45: System Access Control**

**Users of a system, operations staff, and traders should not be able to alter production systems or models. Each system should have access controls that only allow use by authorized individuals in the institution. Developers should have limited access to production systems in a strictly controlled manner**

Problems may arise if anyone is able to modify a production system in a noncontrolled manner. A system developer could alter a system so that key functions are changed, thereby hindering primary business activities. Systems and models may not be able to calculate P&L, credit or positions or to price instruments the way they did previously. As a result, it is important that system and model developers access live models through a controlled process. Further, under no circumstance should sales & trading or operations staff have the ability to change systems.

In addition, access to use production systems should only be allowed for those individuals who truly need to use those systems. When authorizing users for systems, the systems should support the ability to make a user “view only” so that they can read the information in the system, but cannot change that information. System access and entitlements should be periodically reviewed, and users who no longer require access to a system should have their access revoked.

### **Best Practice No. 46: Operational Performance Measures**

**Clear operations performance measurements should be established to report the quality of operations to both management and sales & trading reporting.**

Operations performance reports should contain quantifiable performance metrics that indicate the status of operations' activities (such as the performance of confirmation and settlement procedures) and serve to control and monitor risks. Reports may be generated and distributed to operations and sales & trading management on a regular basis depending on the risk factor of the data reported.

### **Best Practice No. 47: Taped Conversations between Counterparties**

**A bank should record all bank-to-counterparty conversations.<sup>33</sup> Taped conversations should not only include those between the sales & trading groups of the bank and the counterparty, but also conversations between operations of the bank and the counterparty.**

Taped conversations will aid institutions in verifying trade details and ensuring net amounts were confirmed as expected. This step may help a bank if it becomes involved in counterparty disputes. The length of time that a bank keeps tapes depends on the type of business, and may be left to management's discretion, subject to any local regulations. Tape retention may depend on a bank's forward ladder trading or long dated options trading. In certain jurisdictions, counterparties must be informed that their telephone calls are being recorded; operations should check with local legal counsel to determine requirements for each location.

### **Best Practice No. 48: Strong Independent Audit Group**

**Every market participant should have a sophisticated, independent audit unit.**

The audit group plays a very important role. It ensures that the controls in place are in fact working properly. An audit group should help management uncover any problems before they lead to financial loss. The audit group must be independent of the operations it is auditing.

### **Best Practice No. 49: Responsibility for Record Retention**

**Operations is responsible for retaining adequate records of all transactions, and supporting documentation for the financial statements.**

Operations must maintain detailed records of all transactions executed and of all information to support its P&L and position calculations. Each bank should determine the appropriate retention record based on tax, regulatory, and legal issues for each jurisdiction. The records can be maintained on paper, optical, or magnetic media. If any computer-based format is used, then the programs and their documentation need to be retained so that the firm can read that data. Special care must be taken as newer versions of software frequently cannot read older data files, and as older programs may not run correctly on newer operating systems or machines. In addition, magnetic media must be maintained carefully as it degrades in adverse conditions.

### **Best Practice No. 50: Contingency Plans**

**Contingency plans should be written and tested for sales & trading, and operations to cover both the long- and short-term incapacitation of a site, the failure of a system, or the failure of a communication link between systems.**

The primary risk of a major disaster is that a bank will not be able to meet its obligations. Given the volume that many banks trade, failure to settle all transactions from a given center (or several trading centers in the case of centralized operations processing) could have severe financial repercussions for the bank. In addition, regulators are becoming increasingly concerned over the potential systemic problems of such a temporary failure. The loss of a trading room may leave a bank not only with open positions, but also without adequate ability to monitor those positions in a moving market. Besides the financial impact, the reputational implications of not being able to settle obligations would be enormous.

Banks should identify various types of disasters and how each may prohibit the bank from completing daily requirements such as issuing and receiving confirmations, performing settlement procedures, and completing daily trading. Disaster recovery plans should state requisite systems and procedural back-ups, management objectives, and the methodology for dealing with such disasters. One type of disaster a bank should establish alternative trade processing methods for is a failure of the link between sales & trading and operations systems. Management should test these plans on a regular basis to gauge the validity of the plans themselves and to measure staff readiness for dealing with emergency situations.

Corporations should develop contingency contact lists and distribute them to employees. Everyone should know who to contact in a state of emergency and the proper reporting procedures. A crisis team prepared with personal contact numbers of key personnel may be established to inform staff of a disaster and of the ensuing actions to be taken.

Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

Alternate sites should be maintained that can confirm and settle the bank's transactions. In addition, these sites should be able to provide facilities for monitoring and managing position risk during disaster situations. All trading and associated support systems should be backed up. This step requires all historical data to be stored off-site. Back-up systems should also be available to act as primary systems in case primary systems temporarily fail. Back-up facilities should be in place at alternate sites.

Additionally, a bank should identify and practice alternative methods of communication for confirmations and settlements with nostro banks. These may require the use of fax or telex to ensure proper processing. Clients should be notified of potential processing changes in disaster situations. A bank should also ensure that communication tools used by traders are secure. If phone systems fail, backup systems should exist such as cellular or non-PBX phones. A bank should be connected to multiple phone sub-stations to further prepare for disaster.

## Conclusion

This paper has reviewed the entire foreign exchange process flow and the best practices for maintaining a properly controlled environment. However, there are several trends in the industry that will affect a bank's ability to implement the best practices as listed in this document. Although overtime, the market will continue to evolve and develop mitigating controls, in the short term management should consider the following issues raised by the developments of technology, instruments and markets.

- Technology continues to advance at such a rapid pace that traders and salespeople are able to execute many more transactions during periods of market volatility.
- Technology to move from mainframe technology for operations to client-server-based solutions. As this transformation happens, operations must ensure that this new environment has the same level of reliability, control, security, and recoverability as the older mainframe environment, with its dedicated, centralized support team, hot backup sites, etc.
- Volume will continue to grow as many of the developing nations become more active in the international capital markets. This increase in volume will be coupled with new and problematic settlement procedures for these new currencies.
- Traders and salespeople will continue to develop new and more exotic types of transactions, especially in FX derivative products, that require special, often manual, processing by operations until these new transaction types can be included in the main processing cycle.
- New types of clients will continue to deal in the FX market. Recently, the increased activity of fund managers and investment advisors, has led to the need for new trading and settlement procedures.
- Organizations are moving more and more toward a matrix management approach, may contain more “ambiguous authority”. However, the roles and responsibilities of each area has should be clearly defined, especially for people in the operations who play an important role in the overall control environment. In addition, escalation procedures should notify more people in the matrix organization, not less. Good communications among departments and among individuals are a must.
- The trend toward larger regional trading hubs supporting a network of smaller satellite offices makes it much more difficult at the satellite sites to maintain proper separation of duties between sales & trading and operations.

The first step to a properly controlled environment is an appropriate separation of duties between sales & trading, and operations. However, separation of duties does not mean that operations should be considered as separate from the business. On the contrary, the authors of this paper feel that the closer operations management is to the pulse of the business, and the better the communication channels between sales & trading management and operations management, the more responsive operations will be to changes in the business. Ultimately, the overall business will be better controlled.

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Management of Operational Risks in Foreign Exchange  
The Foreign Exchange Committee, April 1996

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- <sup>1</sup> "Controlling the Tentacles of Operational Risk" pp. 6.
  - <sup>2</sup> "Reducing Foreign Exchange Settlement Risk" pp. 30.
  - <sup>3</sup> "Reducing Foreign Exchange Settlement Risk"
  - <sup>4</sup> Banking Circular 277
  - <sup>5</sup> "Standardizing the Confirmation Process"
  - <sup>6</sup> "Standardizing the Confirmation Process"
  - <sup>7</sup> "Guidelines for the Management of Foreign Exchange Trading Activities" pp. 87.
  - <sup>8</sup> "Standardizing the Confirmation Process"
  - <sup>9</sup> "Standardizing the Confirmation Process"
  - <sup>10</sup> "Standardizing the Confirmation Process"
  - <sup>11</sup> "Standardizing the Confirmation Process"
  - <sup>12</sup> "Standardizing the Confirmation Process"
  - <sup>13</sup> "Trading Practices Sub Committee" pp. 6.
  - <sup>14</sup> "Standardizing the Confirmation Process"
  - <sup>15</sup> "Standardizing the Confirmation Process"
  - <sup>16</sup> Banking Circular 277. pp. 22.
  - <sup>17</sup> "Reducing Foreign Exchange Settlement Risk" pp. 28.
  - <sup>18</sup> "Derivatives: Practices and Principles" pp. 16.
  - <sup>19</sup> "Reducing Foreign Exchange Settlement Risk" pp. 6.
  - <sup>20</sup> "Reducing Foreign Exchange Settlement Risk" pp. 25.
  - <sup>21</sup> "Reducing Foreign Exchange Settlement Risk"
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  - <sup>29</sup> "Derivatives: Practices and Principles" pp. 19.
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  - <sup>32</sup> "Evaluating the Risk Management and Internal Controls of Securities and Derivative Contracts Used in Non trading Activities"
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