foreign exchange committee

FXC

ANNOUNCEMENT

May 29, 2013

The Foreign Exchange Committee is pleased to publish a revised version of the "Management of Operational Risk in Foreign Exchange," or the "Sixty Best Practices". This publication amends the version that was last updated in November 2010.

The foreign exchange market landscape is in the midst of a period of significant change driven by the emergence of electronic dealing as a significant alternative to voice, changes in risk management practices driven by the financial crisis, and increased activity by new participants and in new products. The new Best Practices are intended to address these changes. The markets will continue to evolve with the implementation of the Dodd-Frank Act, which has significant implications for portions of the Foreign Exchange market. As the regulatory reform framework is still developing, this version of the Best Practices is not intended to address Dodd-Frank regulations. We expect that as the regulatory reform framework continues to evolve in the United States as well as in other jurisdictions, the Best Practices will also continue to evolve.

In this version we feature a revised introductory section to reflect more recent trends in the foreign exchange market, such as growth in daily FX turnover and increasing diversity in the types of participants active in the foreign exchange market as well as an expanded glossary of key terms. The revisions are also intended to help clarify terminology to avoid confusion, for example: clarifying settlement- versus novation-netting or defining affirmation versus confirmation in the practices. Finally, this version also integrates more recent work on topics including barrier life cycle event processing, monitoring and managing capacity across the FX market landscape, and a summary of confirmation fields relevant to FX options.

We would like to thank the Operation Managers Working Group and the Financial Markets Lawyers Group for their significant work on this revised set of best practice recommendations. We encourage you to use this document and to help promote these practices in support of an efficient, robust, and transparent foreign exchange market.

All the Best,

Jeff Feig
Chair, Foreign Exchange Committee

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Management of Operational Risk in Foreign Exchange

The Foreign Exchange Committee
November 2010
Revised May 2013

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Management of Operational Risk in Foreign Exchange

Introduction

The FX Marketplace

The foreign exchange (FX) market is the largest and most liquid sector of the global economy. According to the 2010 Triennial Survey conducted by the Bank for International Settlements, FX turnover averages $4.0 trillion per day in the cash exchange market, a 20% increase over the 2007 survey results, Activity in OTC interest rate derivatives grew by 24% during the same period, with average daily turnover of $2.1 trillion in April 2010.[1]
The FX market serves as the primary mechanism for making payments across borders, transferring funds, and determining exchange rates between different national currencies.

The Changing Marketplace

Over the last decade, the FX market has become more diverse as well as much larger. Although in the past, commercial banks dominated the market, today participants include FX dealers and non-dealers, including brokerage companies, multinational corporations, money managers, commodity trading advisors, insurance companies, governments, central banks, pension and hedge funds, investment companies, , and other participants . In addition, the size of the FX market has grown as the economy has continued to globalize. The value of transactions that are settled globally each day has risen exponentially—from $1 billion in 1974 to $4.0 trillion in 2010.

The increased complexity of the market and higher trade volumes have necessitated constant changes in trading procedures, trade capture systems, operational procedures, and risk management tools.
A number of changes have also affected the FX market more broadly over the last few years. Those changes include

- Increase in high frequency, lower notional amount transactions and associated capacity constraints,
- Continued consolidation of both FX dealers and nostro banks
- Consolidation of FX processing in global or regional processing centers,
- Outsourcing of operational functions,
- Evolving role of CLS Bank in order to substantially reduce FX settlement risk,
- Increased focus on crisis management and contingency.
- Increased regulatory focus and financial reform.
- Increasing use of technology to include web portals for FX transactions and increased use of electronic confirmations.
- Continued expansion of prime brokerage, and
- The introduction of more diverse types of clients as well as increases in complex product

[1] Bank for International Settlements, *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in April 2010* (Basel: BIS, 2010).

executions.

Developments like these make it crucial that operations, operational technology, and settlement risk management keep pace with the changing FX market.

In 2010 the U.S. Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank"), Title VII of which governs derivative transactions, including certain foreign exchange transactions, and regulates market participants under a new regulatory regime. Since 2010, U.S. regulators have published various regulations implementing Title VII of Dodd-Frank, some of which are in final form but many of which are still in the proposal phase and continue to evolve. In addition, similar regulatory reform efforts affecting the FX market are underway in many jurisdictions in which the FX market operates. Once these regulatory reforms have been finalized and implemented, this document will be updated to provide market participants with guidance in light of the evolving regulatory regime.

The History of This Document

In 1995, the Foreign Exchange Committee (the Committee) recognized the need for a checklist of best practices that could aid industry leaders as they develop internal guidelines and procedures to foster improvement in the quality of risk management. The original version of Management of Operational Risk in Foreign Exchange was published in 1996 and subsequently updated in 2003 and 2010by the Committee's Operations Managers Working Group to serve as a resource for firms as they periodically evaluate their policies and procedures to manage operational risks properly. This update, published in 2012 and written by the working group listed at the end of this document, takes into account market practices that have evolved since the paper's original publication and supercedes previous recommendations by the Committee on operational issues.

In addition to this document, the Committee has often offered recommendations on specific issues related to operational risk. Although the best practices here are directed at FX dealers primarily, the Committee has also offered guidance to other market participants. Such guidance is mentioned periodically in the best practices here and may also be found at the Committee's website, <www.newyorkfed.org/fxc/>.

What Is Operational Risk?

Operational risk is the risk of direct or indirect loss resulting from inadequate or failed internal procedures, people, and systems, or from external events.[2] For the purposes of this paper, we adopt this definition of operational risk put forth by the Bank for International Settlements. However, while reputational risk is not considered part of operational risk for Basel capital purposes, the importance of reputational risk in foreign exchange is reflected in the best practices outlined in this document.

Operational risk for foreign exchange in particular involves problems with processing, product pricing, and valuation. These problems can result from a variety of causes, including natural

[2] Bank for International Settlements, Basel Committee on Banking Supervision, *Operational Risk Supporting Documentation to the New Basel Capital Accord* (Basel: BIS, 2002), p. 2.

disasters, which can cause the loss of a primary trading site, or a change in the financial details of the trade or settlement instructions on a FX transaction. Operational risk may also emanate from poor planning and procedures, inadequate systems, failure to properly supervise staff, defective controls, fraud, and human error.[3]

Failure to adequately manage operational risk, in turn, can decrease a firm's profitability. Incorrect settlement of FX transactions, for example, can have direct costs in improper payments and receipts. In addition, trade processing and settlement errors can lead to indirect costs, such as compensation payments to counterparts for failed settlements or the development of large losses in a firm's portfolio as a result of managing the wrong position. Furthermore, investigating problems and negotiating a resolution with a counterparty may carry additional costs. Failure to manage operational risk may also harm a firm's reputation and contribute to a loss of business.

Operational risk has another distinctive quality. Unlike credit and market risk, operational risk is very difficult to quantify. Clearly, an institution can measure some of the losses associated with operational errors or losses that result from the failure of the operational process to catch errors made by sales and trading areas. Determining expected losses, however, given the uncertainty surrounding those losses, is much more complicated for operational risks than for other risk categories.

What Are "Best Practices"?

This document offers a collection of practices that, in conjunction with Supervisory commitment letters[4] and the implementation of regulatory requirements may mitigate some of the operational risks that are specific to the FX industry. The implementation of these practices may also help to reduce the level of risk in the FX market more generally. Finally, acceptance of these practices may help reduce operational costs. When robust controls are in place, less time and energy is needed to investigate and address operational problems.

The best practices in this document are already used to varying degrees by the working group members responsible for this paper. Collectively, the working group feels that these are practices toward which all market participants should strive. Therefore, this compilation is meant to provide a checklist for organizations new to the market but it is also designed to serve as a tool for established market participants as they periodically review the integrity of their operating procedures. Each firm is encouraged to take into account its own unique characteristics, such as transaction volume and role in the market, as it makes use of the

[3] Foreign Exchange Committee, "Guidelines for the Management of FX Trading Activities," in *The Foreign Exchange Committee 2000 Annual Report* (New York: Federal Reserve Bank of New York, 2001), p. 69.

[4] Supervisors include the Board of Governors of the Federal Reserve System, Connecticut State Banking Department, Federal Deposit Insurance Corporation, Federal Reserve Bank of New York, Federal Reserve Bank of Richmond, French Autorité de contrôle prudentiel, German Federal Financial Supervisory Authority, Japan Financial Services Agency, New York State Banking Department, Office of the Comptroller of the Currency, Securities and Exchange Commission, Swiss Financial Market Supervisory Authority, and the United Kingdom Financial Services Authority.

recommendations. These best practices are intended as goals, not binding rules.

The best practices listed here are recommendations that all parties engaging in FX, regardless of the institution's size or role in the marketplace, should consider adopting for both internal (with the exception of practices that are inapplicable such as credit management and documentation) and external transactions. In addition, it is clear that the larger the participant, the more important it is to implement the recommendations in the most automated manner possible. Smaller participants should make sure that they have appropriate controls in place for any best practice that proves too expensive to automate. Given the differences in the size of firms, it may be helpful to underscore that firms are not bound to integrate all of the recommended practices in this document, but should use them as a benchmark for examining their existing practices.

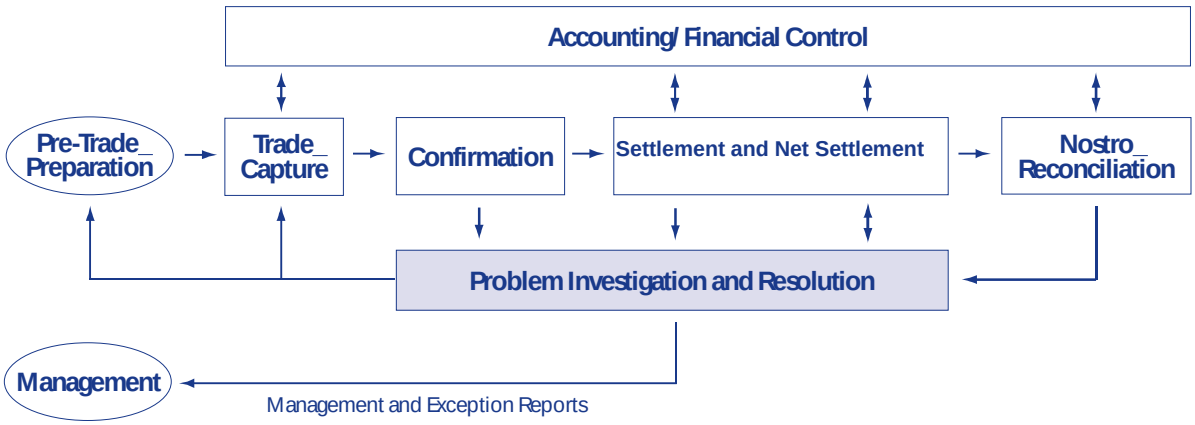
How to Use This Document

This document is divided into sections based on the six steps of the FX trade process flow 1) pre-trade preparation, 2) trade capture, 3) confirmation, 4) settlement and net settlement, 5) nostro reconciliation, and 6) accounting/financial control processes. How each of these seven phases integrates with the others in the FX process flow is outlined in Figure 1 below. Each section of this paper provides a process description of the steps involved in the trade phase discussed in that section, followed by a list of best practices specific to that phase. The paper concludes with a list of general best practices that apply more widely to the overall management of operational risk, including guidance for contingency planning.

This document concentrates on some of the most common areas where operational risk arises in the various stages of the FX process. Often operational errors result from a breakdown in the information flow in the sequential steps of the process. To avoid such problems, it is essential that market participants clearly understand each of the seven stages of FX trade and settlement, and fully comprehend how each phase is related to the larger process flow. A break in the process, especially in the feedback loop, may lead to a breakdown in the flow of information, which in turn increases the potential for financial loss. Proper procedures, including those concerning escalation and notification, should be in place for management to deal with problems wherever they occur in the process flow.

Figure 1_

The FX Process Flow



Future Trends
It is important to acknowledge at the outset that the FX business is constantly evolving. Regulation is changing, technology continues to advance, trading volume in emerging market currencies continues to increase, new exotic structures are continually introduced, and many institutions are regionalizing their sales and trading and operations areas by creating small satellite offices. Some of the major trends that will continue to affect FX operational risk are as follows:

- Regulatory and financial reform will continue to impact operational processing of OTC foreign exchange and is expected to play a key role in future trends for providing transparency and mitigating risks.
- Technology continues to advance rapidly, enabling traders and salespeople to execute many more transactions during periods of market volatility.

- Systems and documents are becoming more standardized, and will use new communication formats
- Trading volume in emerging market currencies continues to grow as many developing nations become more active in international capital markets. This increase in volume is coupled with new and problematic settlement procedures for these currencies.
- Traders and salespeople continue to develop new and more exotic types of transactions, especially in FX derivative products. These require special, often manual, processing by operations groups until new transaction types can be included in the main processing cycle.
- New, more diverse types of clients continue to enter the FX market, which require development of new operational procedures.

All of these trends, and many others, will continue to change the industry, eliminating some risks and introducing new ones. It is imperative that management thoroughly understands the operations cycle and best practices surrounding operational risk management to manage risks properly as the FX marketplace continues to evolve.

At the time of this publication, many Dodd Frank regulatory requirements are not yet in final form. Once finalized, it is expected that this document will be updated as required.

Definitions of Key Terms
To clarify terms used in this document:

Aggregation is a service that combines all matched trades in a given currency pair, in the same direction, for the same settlement date, and with the same counterparty into one, larger, single trade.

Central clearing is the process by which transactions between two parties are cleared by a central clearing house.

Counterparty is the entity with which an FX Dealer has transacted. It can be a bank, or a corporate, institutional, or retail client. The concepts in this document apply to all such market participants.

FX Dealer refers here to all market makers in FX, whether commercial or investment banks.

Sales and trading refers to the front office. Trading employees execute customer orders and take positions; they may act as a market maker, dealer, proprietary trader, intermediary, or end user. An FX Dealer may also have a sales force or marketing staff, which is part of the front office. Salespersons receive price quotes from the FX Dealer's trading staff and present market opportunities to current and potential clients.

Operations is used throughout this document when referring to the processing , settlement, back-office, or middle-office areas. Specifically, operations provide support service to sales and trading.

Interdealer refers to trading between market makers.

Nostro bank, **correspondent bank**, **agent bank**, and **clearing bank** are used interchangeably here. An FX Dealer 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. FX Dealers generally use a different nostro account for each currency that they trade.

Vanilla options refer to options that are standard in the industry. In other words, vanilla options expire at an agreed date and time and have no **fixing** or **averaging** of the strike price.

Nonvanilla ("Exotic") options generally refer to options that have a fixing or averaging component or are part of a structured (combination) option type, for example, average rate options.

Prime brokerage describes an arrangement that allows customers to conduct FX transactions (spot, forward, and options) in the name of an FX Dealer or "prime broker." In a typical prime brokerage arrangement, the customer chooses one or two prime brokers to service their account. The prime broker's responsibility is to set up documentation and procedures that allow the customer to conduct FX transactions directly with several counterparties, but in the name of the prime broker. These executing counter-parties recognize the prime broker as their legal counterparty in such trades. The prime broker enters into equal and opposite trades with the customer and executing counter-parties. Specific procedures are agreed upon among the customer, prime broker, and executing counterparties to effectuate the trading and "give up" relationships. The prime broker typically charges the customer a fee for prime brokerage.

Pre-Trade Preparation and Documentation

Process Description
The pre-trade preparation and documentation process initiates the business relationship between two parties. During this process, both parties' needs and business practices should be established. An understanding of each counterparty's trading characteristics and level of technical sophistication should also develop. In summary, the pre-trade process allows both parties to mutually agree on procedures and practices to ensure that business is conducted in a safe and sound manner.

In the pre-trade process, an FX Dealer develops an understanding of the inherent business risks and risk mitigants of each of its counter-party relationships. The documentation and agreements reflecting the relationship should be identified and, if possible, executed before trading. Thus, pre-trade preparation involves coordination with sales and trading and operations as well as other support areas such as systems, credit, legal, and compliance to establish trade capture parameters and requirements that should be in place prior to trading. This process is especially important when the business requirements may be unique and require additional controls.

Best Practice no. 1:
Know Your Customer
An FX Dealer should know the identity of its counterparties, the activities they intend to undertake with the FX Dealer, and why they are undertaking those activities.

All firms should have strong Know Your Customer (KYC) procedures for collecting information required to understand who the customer is, where and how they are organized, including whether or not they are an "eligible contract participant" ("ECP"), as defined under the Commodity Exchange Act, as amended and why they are conducting business, . KYC procedures have long been the first line of defense for FX Dealers in setting appropriate credit limits, determining the most appropriate documentation for the activities being contemplated, identifying additional business opportunities, and protecting against fraud and complying with applicable government sanctions that may be imposed against certain countries and interested persons/entities.

KYC procedures have also become the cornerstone for combating criminal activity. Illicit activity has become more sophisticated in the methods used to conceal and move proceeds. The global response has been to develop laws and regulations requiring institutions to establish familiarity with each of their counterparties to better identify and report suspicious activity.

At a minimum, information relating to the identity of a counterparty and the counter-party's activity should be gathered to satisfy applicable laws and regulations for prudent business conduct. The reputation and legal risk to FX Dealers of not being vigilant in knowing their customers and complying with KYC laws and regulations can be severe. In the United States, examples of laws and regulations that impose obligations of this sort on FX Dealers are the

Bank Secrecy Act, anti-money laundering regulations, U.S. Treasury, Office of Foreign Assets Control (OFAC) regulations, and the USA PATRIOT Act.

Best Practice no. 2:
Determine Documentation Requirements
An FX Dealer should determine its documentation requirements in advance of trading and know whether or not those requirements have been met prior to trading.

An FX Dealer should execute transactions only if it has the proper documentation in place. The types of documentation that may be required include 1) master agreements (see Best Practice no. 3),
2) capacity and authority documentation, 3) tax forms (if applicable) and 4) standard settlement instructions. Such documents should be routinely checked before executing trades. An institution should also establish a policy on whether or not it will trade, and in what circumstances, without first obtaining a master agreement (for example, IFEMA, IFXCO, ICOM, FEOMA, or the ISDA Master) with a customer covering the transactions. It should also be noted that electronic trading often requires special documentation. Specifically, customer and user identification procedures, as well as security procedures, should be documented.

This recommendation emphasizes the principles of awareness and information with respect to documentation. In practice, it may be difficult to do business with a policy that requires documentation to be in place in every instance. In many cases, the risks of not having a particular piece of documentation may be acceptable. Nonetheless, it is crucial that all relevant personnel 1) know the policy of the institution on documentation, 2) know when the documentation is or is not in place and 3) be able to produce reports regarding documentation status.

Representatives of the business, operations, credit, legal, tax and compliance areas, for example, need to establish the institution's policies and document their understanding of these policies in writing. The institution should have adequate tracking mechanisms in place (manual or other) to determine when policy requirements are satisfied or not. These mechanisms should be able to produce reports necessary for proper contract monitoring.

If the institution has a policy that requires master agreements to be in place with some or all counterparties (as set forth in such policy), the institution should be able to produce a report displaying those counterparties approved for trading that have not entered into master agreements in contravention of such policy. Such reports should classify data by age and be distributed to management. Lastly, there should be escalation and support procedures in place for dealing with missing documentation when normal efforts are not enough to obtain it.

Best Practice no. 3:
Use Master Netting Agreements with Credit Support Annexes Attached

If an FX Dealer elects to use a master agreement with a counterparty, the master agreement should contain legally enforceable provisions for "closeout" netting and/or settlement netting.

"Closeout" and settlement netting[5] provisions in master agreements permit an FX Dealer to decrease credit exposures, increase business with existing counterparties, and decrease the need for credit support of counterparty obligations.[6] Closeout netting clauses provide for 1) appropriate events of default, including default upon insolvency or bankruptcy, 2) closeout of all covered transactions, and 3) the calculation of a single net obligation owed to or by the non-defaulting party arising from the gains and losses under the individual transactions terminated by such closeout. Closeout provisions have the added benefit of a positive balance sheet effect under Financial Accounting Standards Board (FASB) Interpretation 39, which allows the netting of assets and liabilities in the unrealized gains and losses account if netting is legally enforceable in the relevant jurisdiction.[7]

Closeout netting provisions help to protect an FX Dealer in the event of a counterparty default. When a counterparty defaults, and a closeout netting agreement is not in place, the bankruptcy trustee of the defaulting party may demand payment on all contracts that are in-the-money 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 signed by both parties with enforceable closeout netting provisions ensures that the counterparty remains responsible for all existing contracts and not just those it chooses to endorse.[8]

Settlement netting permits a party to settle multiple trades with a counterparty with only one payment or receipt, instead of settling each trade individually with separate payments. Consequently, settlement netting decreases operational risk to the FX Dealer in addition to reducing settlement risk. To realize the settlement netting benefits, however, an FX Dealer's operations function must commence settling on a net basis. Therefore, it is essential that operations receive a copy of the agreement or be notified of the terms of the executed agreement. Given the benefits of settlement netting, it is in an FX Dealer's best interest to include settlement netting in any master agreement that it may enter into.

The following master agreements have been developed as industry-standard forms. Each form includes provisions for settlement netting (included as an optional term) and closeout netting:

- ISDA Master Agreement,
- IFEMA Agreement covering spot and forward currency transactions,

[5] This best practice relates to "closeout netting" in the event of default and "settlement netting" upon payment dates. It does not address novation netting.

[6] U.S. Comptroller of the Currency, *Banking Circular 277* (Washington, D.C.: GPO, 1993), p. 22.

[7] Financial Accounting Standards Board, FASB Interpretation No. 39: Offsetting of Amounts Related to Certain Contracts: An Interpretation of APB Opinion No. 10 and *FASB Statement No.105*, (FASB, March 1992), and *FASB Statement No. 105*: Disclosure of Information about Financial Instruments with Off-Balance-Sheet Risk and Financial Instruments with Concentrations of Credit Risk, (FASB, March 1990).

[8] Group of Thirty, Global Derivatives Study Group, *Derivatives: Practices and Principles* (Group of Thirty, 1993), p.16.

- IFXCO Agreement covering spot and forward currency transactions and currency options,
  - ICOM Agreement covering currency options,
  - FEOMA Agreement covering spot and forward currency transactions and currency options.

These netting provisions should satisfy relevant accounting and regulatory standards as long as legal opinions are able to conclude that the agreements are legally enforceable in each jurisdiction in which they are applied. FX Dealers should confer with local legal counsel in all relevant jurisdictions to ensure that netting provisions are enforceable. To the extent that local counsel suggests that certain provisions of a master netting agreement may be unenforceable, the FX Dealer should ensure that other provisions in the agreement could be enforced nonetheless.
A credit support annex (CSA) can also be negotiated as a supplement to these master netting agreements. CSAs provide for the movement of collateral between parties during the term of outstanding transactions governed by the master netting agreement in order to reduce the net exposure that may result in the event of a trading counterparty's bankruptcy or other default under such agreement. Under a CSA, one or both parties agree to post collateral to secure counterparty credit exposure, typically on a net basis. Under these CSAs, failure to deliver required collateral also constitutes an event of default under the master netting agreement.

There may be two components to any collateral arrangement. The primary component is a requirement to deliver collateral based on the net mark-to-market valuation of all transactions documented under the master agreement, or "variation margin." In the case of the ISDA CSA, variation margin is determined based on mid-market values for the transactions and does not reflect the bid or offer spread that would result in replacing the transactions in an actual default of one of the parties. Variation margin is calculated at mid-market in order to avoid one party being preferred over the other as a result of calculating the mark-to-market value of transactions at that party's side of the market (which would include bid or offer, as applicable). Variation margin is most commonly calculated based on the previous day's closing marks and is delivered on a daily basis to the party that has the net receivable in the event of a closeout of the transactions.

The other component to the collateral requirement is commonly referred to as "initial margin" (or "Independent Amount," the term used in the ISDA CSA). The purpose of this collateral requirement--which may be defined for specific transactions, a portfolio of transactions, or all transactions governed by the relevant master agreement, either in the credit support document or in transaction confirmations--is to provide additional cushion beyond the mark-to-market exposure. In cases where a party's trading partner is in default, the initial margin is intended to serve as a buffer to protect against market movements in transaction values during the time between the last variation margin delivery and the date on which the non-defaulting party can actually close out positions and apply collateral or when a bid-offer spread is applied in order to determine replacement value.

Best Practice no. 4:
Agree upon Trading and Operational Practices

Trading and operational practices should be established with all counterparties.

Most FX Dealers reach an understanding with all counterparties as to the type of business they will be transacting and how they should interact. FX Dealers should include key operational practices such as providing timely confirmation or affirmation, the use of standing settlement instructions (SSIs), and timely notification of splits/allocations of bulk or block trades (detailed below) either directly or enabled through automated allocation systems.

The understanding should clearly establish confirmation and settlement procedures for all counterparties and delineate both the FX Dealer and client's obligations in the process flow. An FX Dealer should strongly encourage clients to confirm bulk trades as soon as possible after the trade is executed.[9] In addition, an FX Dealer should request that fund managers provide them with the "split" (or allocation) information on the trade date for all trade types regardless of maturity, so that the FX Dealer's credit exposure can be reflected properly as soon as possible.

The level of trading activity with fund managers and investment advisors has escalated in recent years. These parties transact in block or bulk trades, which are then split into smaller amounts and entered into specific underlying counterparty accounts. Until a block or bulk trade is properly allocated to the specific underlying counterparty, inaccurate credit risk management information may exist.

Best Practice no. 5:
Agree upon and Document Special Arrangements
If, in the course of the documentation set-up and establishment of trade and operational practices, it becomes clear that a counterparty requires special arrangements—such as third-party payments (TPP) or prime brokerage service—those arrangements should be agreed upon and documented in advance of trading.

Counterparties at times may request third-party payments to facilitate underlying commercial transactions. Third-party payments are the transfer of funds in settlement of a FX transaction to the account of an entity other than that of the counterparty to the transaction. Third-party payments may include, but are not limited to: (i) payments made to entities that have either a corporate or service-level relationship with the counterparty such as subsidiaries or affiliates or special purpose vehicles that have retained the counterparty to provide certain services, (ii) payments made on behalf of the counterparty in connection with mergers and acquisitions in which the counterparty is a buyer or seller, and (iii) payments made to a counterparty's broker or vendor.

Third-party payments raise important issues that need to be closely considered by an organization engaged in such practices and FX Dealers should formulate policies and implement procedures with respect to the use of settlement proceeds of FX transactions to settle with third parties. In formulating and implementing such third party payment policies and procedures, firms should recognize that third-party payments may cause a significant increase in operational, settlement, and reputational risk since the identity and entitlement of the third party

[9] For further information, see Best Practice no. 21, Confirm All Block Trades and Split Allocations.

is not known to the FX Dealer. Accordingly, such policies and procedures should include mechanisms for validating both the authenticity and correctness of such requests prior to such requests being approved. In addition, regulatory requirements such as the USA PATRIOT Act, OFAC, the Bank Secrecy Act, and other sanctions screening should also be applied in connection with such third party payments.

Prime brokerage arrangements may also involve special occasions for misunderstanding the respective rights and obligations of the various parties. Such arrangements should be evidenced by written agreements (prime broker and dealer, prime broker and customer, dealer and customer) in accordance with standard FX Dealer templates that have been approved by the FX Dealer's legal department. Deviations from such standard templates should be approved by relevant departments within the FX Dealer in accordance with its prime brokerage documentation policies.

Trade Capture

Process Description

The trade capture function is the second phase of the FX processing flow. Deals may be transacted directly by telephone, through a voice broker, via an electronic matching system (for example EBS and Reuters), or through Internet based systems (for example, proprietary trading systems or multidealer trading platforms).

After the deal is executed, the trader, or trader's assistant, inputs trade data into the front-office system or writes a ticket to be entered into an FX Dealer's operations system. Deals done over electronic dealing systems such as Reuters or EBS allow deal information to flow electronically to the front-office system. Trade information typically includes trade date, time of trade, settlement date, counterparty, financial instrument traded, currency pair, amount transacted, price or rate, and may include settlement instructions.

The system used in the front-office processes this information and can provide "real-time" position and profit and loss updates. Trade information captured in the front office system flows to the credit system where settlement risk and mark-to-market (also referred to as pre-settlement) credit risk measures and limits are updated.

Trade information from front-office systems flows through to the operations system for further data enrichment (dependent on the back office system at that institution), where it is posted to sub-ledger accounts, and the general ledger is updated as trades are processed. Operations staff should be responsible for ensuring that appropriate settlement instructions are captured so that the required confirmation message can be issued. For interbank, institutional, and corporate counterparties with Standard Settlement Instructions (SSIs) on file, the deal is immediately moved to the confirmation process.

However, if SSIs are overwritten or not in place, operations staff must obtain settlement instructions from the counterparty or confirm the settlement instructions received by sales and trading. For forward trades that are not settled until sometime in the future, the financial details

of the trade should be confirmed on the trade date, including settlement instructions when possible. If SSIs need to be amended, changes should be implemented in a controlled manner by operations.

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 staff needs to receive split information soon after trade execution to issue confirmations for each of the split transactions.

Inaccurate or untimely trade capture can have implications for profit and loss statements and risk management for an FX Dealer. If an FX Dealer does not capture the correct transaction, then its positions and reported credit exposure will be incorrect.

Best Practice no. 6:
Enter Trades in a Timely Manner
All trades, external and internal, should be entered into the relevant front office system as soon as technologically practicable and be accessible for both sales and trading and operations processing as soon as they are executed.

It is crucial that all trades are entered so that all systems and processes are provided with timely, updated information. No matter how sophisticated the system, data may not be accurate or updated if users enter it incorrectly or delay its entry. In addition, it is important to ensure that the duties of trade entry are appropriately segregated. Front-end systems that capture deal information may interface with other systems that monitor and update the following:

- credit limit usage,
- intra-day profit and loss,
- trader positions,
- confirmation processing records,
- settlement instructions, and
- general ledger activity.

An FX Dealer's ability to manage risk may be adversely affected if it does not have accurate transaction updates in each of the above areas. Inaccuracies in any category may not only erode an FX Dealer's profitability, but may also tarnish an FX Dealer's reputation. In the event of a settlement error, for example, the FX Dealer must pay compensation costs to the counterparty and cover short cash positions. Moreover, incorrect financial statements arising from problems in general ledger data can harm the reputation of the FX Dealer. Further, if credit positions are not properly updated, the FX Dealer may take on more risk to a counterparty, industry, or country than would be prudent.

In addition, it is important to note that internal trades should be subject to the same degree of diligence as external trades in terms of timely entry because they carry the same risks (with the exception of credit risk).

Best Practice no. 7:
Use Straight-Through Processing
When sales and trading and operations use separate systems, electronic feeds should automatically feed all deals, adjustments, trade splits 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.

To ensure timely processing by operations and eliminate potential errors that can occur if trades are reentered into the operations systems, straight-through processing should exist between sales and trading and operations. Such a link should move deals, adjustments, and cancellations to the operations system as soon as sales and trading finalizes them. This transaction data—also passed straight through to other systems in the institution—will further decrease potential errors that can occur when information is manually keyed into systems. This practice also improves the timeliness of the data.

Most brokered transactions are now executed over automated broker systems. Therefore, straight-through processing links from these systems into sales and trading should also be implemented when volume warrants.

Best Practice no. 8:
Use Real-Time Credit Monitoring
Credit lines and usage information should be updated as soon as deals are entered, and the information should be accessible to sales and trading and risk managers. An FX Dealer should establish real-time credit systems to calculate and aggregate exposures globally across all trading centers.

An FX Dealer should execute transactions only if credit lines have been approved and are available for a designated counterparty. No trade should be finalized without confirming the availability of sufficient credit. Electronic broker credit pre-screening platforms are preferable to the practice of brokers switching counterparties. In the event of default by a counterparty, an FX Dealer could lose the positive market value of the positions it has with the defaulting party or, if default occurs in the middle of settlement, it could lose the entire principal of the settlement amount already released.

A sales and trading team should be able to quickly assess its institution's credit exposure to its counterparties globally. These exposures should be communicated in real-time to the trading system. The system should take into account changes in static credit lines for electronic trading platforms that periodically may need to be updated or revised. The system should also automatically update a counterparty's credit status when the counterparty deals with the FX Dealer on a global aggregate basis. This requires straight-through processing from the trade capture system to a real-time credit system.

Sales and trading should see the effects of a deal on a counterparty's credit status immediately, and that unit should know when a counterparty's credit limit is close to being filled and be prevented from dealing with counterparties who have reached or exceeded such limits. Sales

and trading and credit management should produce reports of credit line excesses and exceptions on a regular basis for review. Exception reports should identify both counterparties involved and the sales and trading personnel executing the transactions.

Real-time credit systems also allow an FX Dealer's credit risk managers 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. A real-time credit system ensures that any changes in the credit limit of a counterparty are reflected in the sales and trading system immediately.[10]

Best Practice no. 9:
Use Standing Settlement Instructions
Standing Settlement Instructions (SSIs) should be in place for all counterparties. Market participants should issue new SSIs, as well as any changes to SSIs, to each of their trading partners in a secure manner, preferably utilizing electronic means. For FX Dealers, the preferable method is through an authenticated medium such as SWIFT messaging.

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 because operations may not have to manually intervene in 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 manually intensive process involved in inputting, formatting, and confirming settlement instructions increases the opportunity for errors in settlement, making SSIs imperative for risk management and efficiency.
Collection and delivery of SSIs should be undertaken by a dealer's static data team with clear segregation of duty.

Institutions should update their records promptly when changes to SSIs are received from their counterparties. When an institution changes its SSIs, it should give as much time as possible—preferably four weeks' notice with a minimum of two weeks' notice—to its counterparties so that they can update their records before the date that the new SSIs become effective.
SSIs for forward transactions can change between the time a deal is confirmed and the time it finally settles. Consequently, an FX Dealer should either reconfirm all settlement instructions for forward deals before settlement, or it 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.

All settlement instructions should be authenticated with the counterparty.

[10] U.S. Comptroller of the Currency, *Banking Circular 277* (Washington, D.C.: GPO, 1993).

Best Practice no. 10:

Operations Should Be Responsible for Settlement Instructions

Operations should be responsible for ensuring that settlement instructions are collected and confirmed. If no SSIs are in place, operations should be responsible for obtaining and verifying the instructions.

Although SSIs are preferred, they are not always available, and at times SSIs may not be appropriate for all trades. When SSIs are not used, the settlement instructions may be recorded at the time that sales and trading conducts the trade. These exception settlement instructions should be delivered by the close of business on the trade date (if spot) or at least one day prior to settlement (if forward). Nonstandard settlement instructions should be exchanged electronically if possible and should be checked by operations when the trade is confirmed. By taking responsibility for settlement instructions, operations serve the role of an independent control on sales and trading activity.

Best Practice no. 11:

Review Amendments

Amendments to transaction details should be conducted in a controlled manner that includes both sales and 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, an incorrect settlement date or rate, wrong direction (i.e. a buy instead of a sell or vice versa), or makes other data errors.

Although either operations or sales and trading staff can initiate amendments and cancellations, both sales and trading and operations should be involved in the process to maintain proper control. It is imperative, however, that the duties related to processing amendments and cancellations are clearly segregated between operations and sales and trading and that internal policies with regard to such amendments and cancellations are followed. This segregation of duties is one of the key control mechanisms of any institution.

The specific process for handling amendments and cancellations will vary from firm to firm and is often dictated by system constraints. However, if operations staff is responsible for amending or canceling a deal, it should obtain supporting documentation and receive prior written authorization from sales and trading before processing the amendments or cancellations. Exception reporting on amendments and cancellations should be made available to sales and trading and operations management regularly. The criteria used for reporting and the frequency of distribution will vary by firm.

Amendments to swap transactions may present difficulties for an FX Dealer if the near leg has already 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 profit and loss. Because the near leg has settled, it cannot be changed to reflect profit and loss differences.

Thus, amendments to swaps should be made with care so that resulting positions and profit and loss are accurate.

Best Practice no. 12:
Closely Monitor Off-Market and Deep-in-the-Money Option Transactions
To the extent permitted by applicable law, all dealer institutions that allow requests for Historical Rate Rollovers (HRRs) should have written procedures to guide their use and should detail the added controls required in the trading and reporting of off-market transactions. Operational responsibilities should be clearly defined in regard to monitoring, reporting, and special confirmations, if any are needed. Such special confirmations may be necessary to identify the market forward rate in effect when the HRR was executed. The sale of deep-in-the-money options warrants special attention and specific procedures applicable to sales and trading staff (and, if necessary, senior management and risk management approval).

Historical rate rollovers involve the extension of a forward foreign exchange contract by a dealer on behalf of a customer at an off-market rate. As a general rule, all transactions are executed at current market rates. However, at times commercial considerations may dictate otherwise. For more information, see The Foreign Exchange Committee Annual Report 2000, "Guidelines for the Management of FX Trading Activities," p. 74, and The Foreign Exchange Committee Annual Report 1995, "Letter on Historical Rate Rollovers."
An off-market rate transaction can have the effect of making a bank loan to a counterparty if the counterparty's position is out-of-the-money. Extending this out-of-the-money position should be underwritten and approved by risk management.
The sale of deep-in-the-money options warrants special attention and specific procedures applicable to sales and trading staff (and, if necessary, senior management and risk management approval). There may be legitimate reasons for the sale of such options—for example, the "sell back" of an option or the implied delta within a separate derivatives product. However, it should also be recognized that the sale of deep-in-the-money options can be used to exploit weaknesses in a counterparty's revaluation or accounting process that could create erroneous results. Procedures should ensure an appropriate level of review—if necessary, by senior trading management and risk management outside the sales and trading area—to guard against potential legal, reputational, and other risks.

Confirmation

Process Description

FX transactions can be executed in multiple ways, including via phone (direct), through brokers (voice or electronic) or on electronic trading platforms. While an FX transaction will be legally binding on the parties from the time the terms of the transaction are agreed to (whether over the telephone or otherwise), FX transactions are typically subsequently confirmed in writing by way of a "confirmation," either by traditional means such as mail, or via electronic communication.

The confirmation, which should be produced promptly after trade execution, will constitute legal evidence of the terms of the FX transaction. It should identify the economic terms of the trade and any other relevant information and be dispatched to the counterparty at the earliest

possible opportunity. It is the responsibility of each party to actively match and validate its own transaction records with incoming confirmations from its counterparty.

While it is market practice to affirm trade details, which may be done verbally, through the exchange of trade recaps or emails or otherwise, because a confirmation documents the terms of the transaction to which the parties are bound, the additional confirmation step is essential for mitigating risk in the FX markets. Management of the confirmation process is a crucial control. It is particularly important that the process be handled independently of sales and trading personnel. In most institutions, the operations department performs this activity.

Any exceptions to sending or matching received confirmations should be reviewed and approved by appropriate management within the institution because when trades are not confirmed, exposure to market risk arises. To mitigate risk, standard escalation procedures should be in place to pursue and resolve all trade term discrepancies in a timely manner. Operations staff should be responsible for reporting all unconfirmed trades and unmatched incoming confirmations to sales and trading. When necessary, the taped telephone conversation or the log from an electronic execution system can be used to resolve the discrepancy. Once the problem has been identified, the party with the error should correct the affected items in its system and issue/request a corrected confirmation.

Confirmations are often sent via traditional methods such as fax, courier, mail and, if permitted, email, but counterparties might also/instead elect to use a third party's electronic confirmation matching services or confirm transactions via a proprietary electronic portal. Such an "electronic confirmation" could take the form of an electronic message sent by one party directly to the other party or through a third party platform or trade blotter. The confirmation could be in the form of "click-acceptance" by a party or an electronic trade affirmation sent by a dealer through a trading platform or other online system designed to accept trade confirmations as agreed by the parties. Alternatively, the confirmation could take the form of non-objection to trade details, send to an online trade blotter pursuant to an agreement between the parties.

Confirmations should be transmitted in a secure manner whenever possible. In the most developed markets, confirmations are frequently sent via electronic messages through secure networks though in some instances proprietary systems have been developed to provide access to confirmations to clients. Where confirmations are sent via mail, e-mail or fax, it is important to note that because these are open communication methods, there is a greater risk of fraudulent correspondence. For confirmations transmitted via such non-secure means, additional steps are prudent to ensure that special care is taken for confirmations.[11]

A confirmation should include all relevant data that will allow the counterparties to accurately agree to the terms of the relevant transaction. Confirmations should be subject either to the 1998 FX and Currency Option Definitions issued by the Foreign Exchange Committee, Emerging Markets Traders Association (EMTA) and International Swaps and Derivatives Association (ISDA) or other appropriate guidelines, and should reference the underlying bilateral master

[11] Please see Best Practice 14 (Establish a Framework for Managing Affirmations and Confirmations Received via Non-Secure Means) for further details.

agreement if one exists between the parties. With the master agreement, the confirmation forms a single agreement between the parties.

While transactions executed bilaterally via voice brokers should be checked against the broker advice that is typically received on the trade date from the voice broker, it is important to note that broker advices are not bilateral confirmations between the principals of the trade and therefore do not carry the weight of a bilateral confirmation and should not take the place of a confirmation.

In recent years, electronic trading and automation of confirmations has become more prevalent. As an increasing number of FX transactions are being executed through secure electronic platforms (for example EBS and Reuters) or via online electronic dealing platforms, some counterparties have agreed on a bilateral basis to substitute an exchange of traditional written confirmations with the electronic affirmation facilities offered by the electronic trading systems. These facilities allow a party's operations personnel to review trading system data and validate trade details electronically. Automated matching can be a reliable and efficient way to confirm FX transactions. [12]

Best Practice no. 13:
Confirm and Affirm Trades in a Timely Manner
Both parties should make every effort to send confirmations, and, where appropriate, positively affirm trades, as promptly as practicable.

Prompt transmission of confirmations is key to the orderly functioning of the marketplace because by memorializing the agreed trade terms they minimize market risk and minimize losses due to settlement errors.

In order for confirmations to be timely and accurate, they should be generated expeditiously, formatted based on trade data captured in the FX Dealer's operations system and transmitted as soon as possible after a trade is effected. Counterparties should either send out their own confirmations, or sign and return incoming confirmations, unless otherwise agreed. In some instances where paper confirmations are used, counterparties may bilaterally agree in advance to allow "negative affirmation"—this means if one counterparty sends a confirmation to its counterparty and that counterparty does not dispute the confirmation within a pre-agreed period of time, per that bilateral agreement the transaction would be deemed agreed and concluded on the terms within the confirmation.

Additionally, in order to further increase the efficiency of the confirmation process, counterparties may be able to consider the match of a transaction conducted on an electronic platform as legal confirmation. Again, this may be accomplished if the parties to a trade conducted on an electronic platform have previously bilaterally agreed that an electronic match by the platform shall constitute a legal confirmation. An electronic platform may also design its rules such that matches on the platform constitute a legal confirmation. It is also prudent, if a

[12] For further guidance on electronic validation and affirmation, see Foreign Exchange Committee, "Supplementary Guidance on Electronic Validations and Confirmation Messaging," in The Foreign Exchange Committee 2001 Annual Report (New York: Federal Reserve Bank of New York, 2002).

party is to electronically manifest its assent to an electronic "click-wrapped" confirmation, and be bound thereby, for the terms in the confirmation to be reasonably conspicuous to the average user when it clicks to give its assent.

In order to ensure the integrity of the confirmations process, and to preserve the separation of responsibilities, confirmations should be sent directly from a party's operations department to the counterparty's operations department. Individuals involved in trade execution should not be engaging in the confirmation matching process.

Data included in the confirmation should contain, in addition to the economic terms of the trade: the identities of the parties to the FX transaction, the offices through which they are acting, the broker (if applicable), the transaction date, the settlement date, the valuation date, the amounts of the currencies being bought and sold, and the buying and selling parties.

The above described procedures are equally applicable in the case of prime brokerage relationships, where a financial institution extends its credit to a third party dealing with the institution's customer.

Best Practice no. 14:

Establish a Framework for Managing Affirmations and Confirmations Received via Non-Secure Means

Affirmations and confirmations received via non-secure means require special care and each institution should develop a framework for handling such scenarios.

With some trade types and counterparties, there is an inability to confirm trades via an electronic system or platform. In such instances, various other communication methods may be used for the confirmation and affirmation process, including fax, email, and telephone. When manual communication media are used, various risks are introduced, ranging from human error to possible fraudulent correspondence. When employing open communication systems, especially email, this risk increases. There is a direct correlation between the openness of communication links and the possibility of fraudulent actions.

Telephone affirmations are the least reliable method for affirming trades and are prone to errors. When using the telephone, attention to detail and clarity must be emphasized.
If there is no other option than the telephone, these conversations should only take place between operations staff, or designated individuals appropriately segregated from execution on the client side. Following the telephone affirmation, both parties should record the date, time, telephone line, and the name of the individual with whom the trade was affirmed. All relevant information, financial details, and settlement instructions should be affirmed. Following the telephone affirmation, both parties should record the date, time, telephone line, and the name of the individual with whom the trade was affirmed.

For all non-secure affirmations, both parties should promptly subsequently exchange and match a formal, secure, written confirmation (as may be required by regulation).

Best Practice no. 15:
Be Diligent When Confirming Structured or Nonstandard Trades
Special care must be taken when confirming the details of structured transactions or nonstandard trades that cannot be confirmed by an FX Dealer's normal procedures or processes. Whenever possible, standard confirmation formats should be used. These formats should identify the calculation agent, special rights and responsibilities assigned to each counterparty, and special instructions on pricing sources, if any.

Structured transactions, including non-standard non-deliverable forwards (NDFs), often contain unique features such as special pricing or settlement conventions. Trade details may also assign responsibilities to each counterparty by identifying the calculation agent or the confirming party. Every feature of the trade detail affects the valuation of the trade. Consequently, the price, price source, calculation agent, and confirming party must be carefully validated.

Currently, the standard SWIFT confirmation format might not accommodate all the unique features of structured trades. Confirmations supporting these transactions are often manually prepared, transmitted by fax, and manually matched against accounting records. Because of the complexity of these trades, and the fact that they are often manually confirmed, there is a significant risk that the confirmation process may fail to detect errors or omissions.

Unlike standard trades, confirmations for structured transactions are usually provided by a calculation agent or jointly between two calculation agents. It should be clear which of the two counterparties is acting as calculation agent (or joint calculation agent status should be indicated). Additionally, the roles and responsibilities of the calculation agent or joint agents should be specified. The calculation agent may also have certain rights and obligations related to price observations and confirmations. These rights should be clearly identified in the text of the confirmation or in the trade contract.

Standardizing the confirmation process, including the use of master confirmations, can substantially reduce the operational risk associated with this process. Every effort should be made to use the standard confirmation formats outlined by the FX Committee, the Emerging Markets Traders Association (EMTA), and the International Swaps and Derivatives Association (ISDA). Not only should these formats be employed, but every confirmation should also clarify when nonstandard price sources, disruption events, expiration times, or any other nonstandard elements of a trade are introduced.

Best Practice no. 16:
Institute Controls for Trades Transacted through Electronic Trading Platforms
If two parties bilaterally choose to validate trade data against an electronic front-end trading system in place of exchanging traditional confirmation messages, both parties should ensure that trade data flows straight through from the front-end system to their respective operations

systems. Strict controls must be in place to ensure that the flow of data between the two systems is not changed and that data is not deleted.

Issuing traditional confirmations via an in-house proprietary system or through a third party vendor is always considered a best practice from a risk perspective because this reflects the books and records of both counterparties. However, firms with well-established controls and straight-through processing may consider agreeing with a counterparty to accept validation of trade data over a secure electronic platform to constitute a legally binding confirmation, whether by means of a bilateral agreement between the parties or agreement to adhere to the rules of the platform, where the rules provide such validation will constitute a legally binding confirmation, if the recorded trade details are deemed sufficient to validate the trade terms. Only institutions that have direct feeds from dealing systems all the way through their operations systems, however, should employ this exception process and consider this acceptable as an alternative to traditional confirmations.

Best Practice no. 17:
Verify Expected Settlement Instructions
Upon receipt of a confirmation, firms should verify standard or alternative settlements instructions.

It is recommended that standard settlement instructions (SSIs) be used at all times and an authentication process be used to validate these instructions. Any exception to using standard payment instructions (such as Third Party Payments described in Best Practice no. 5) should be clearly documented and approved.

Parties should ensure that SSIs have been exchanged in conjunction with the underlying trade agreement and should check inbound confirmations for any changes to settlement instructions, to be sure of the correct settlement instructions are recorded for the transaction. It is best to discover and correct errors in settlement instructions before payment instructions are issued, in order to reduce the incidence of error for both parties

Best Practice no. 18:
Confirm All Netted Transactions[13]
All transactions, even those that will be netted, should be confirmed individually.

Netting trades for settlement is an important operational function because it allows an FX Dealer to reduce settlement risk and operational cost. However, it is still necessary to confirm all transactions individually. If trades to be netted are not confirmed individually, trades may be mistakenly added or removed from the net figure(s), which will be difficult to detect on settlement day. Incorrect netting, in turn, will impact the accuracy of credit and settlement risks. It may also cause losses to an FX Dealer if the dealer must pay gross amounts instead of netted

[13] Additional recommendations for netting trades can be found in Foreign Exchange Committee, "Guidelines for FX Settlement Netting," in *The Foreign Exchange Committee 1996 Annual Report* (New York: Federal Reserve Bank of New York, 1997).

amounts or if it has to cover overdrafts resulting from incorrect settlement. The confirmation of trades to be netted should be performed as it would be in any other transaction.

Best Practice no. 19:
Confirm All Affiliate Transactions
Affiliate transactions should be subject to similar procedures as those in place for third party clients. Affiliated counterparties should confirm or match transactions as if they transacted a deal with third party counterparties.

Operations and management are encouraged to apply equivalent control procedures when executing affiliate deals as for third party deals. An FX Dealer should recognize that deals done with affiliated counterparties are not immune from errors. Lack of confirmations will prevent the timely recognition of trade errors, thereby increasing the risk of settlement mistakes or incorrect funding. Consequently, an FX Dealer should issue confirmations and should abide by the standard confirmation process for all affiliated counterparties to preserve controls and risk management procedures.

If multiple systems are used by an institution, then the confirmation process should be automated across those systems. In institutions in which only one system is used across affiliated counterparties, a process should be set up within that system to insure that both sides of the transaction are properly recorded and matched.
Furthermore, internal transactions, desk-to-desk, should be affirmed by the operations teams of those desks for risk management purposes.

Best Practice no. 20:
Confirm All Block Trades and Split Allocations
When block trades combine several split trades, the full amount of the block trade should be affirmed as promptly as practicable. All allocations for split trades should be confirmed separately, including legal counterparty, as promptly as practicable and no later than the end of the business day on the trade date.
Sub-account allocations are necessary to evaluate not only credit exposure but also potential regulatory compliance.

In recent years, the use of block (or bulk) trades has increased as trading with fund managers and investment advisors has grown. Such fiduciaries combine several client trades into larger block trades that are then allocated to the fiduciary's specific clients. Until a block is properly allocated to the specific client, inaccurate credit risk management information may exist. FX Dealers should use particular caution when establishing practices for block trades.

Fund managers should provide FX Dealers with the allocation information as soon as possible after execution of the trade for all trade types regardless of maturity, preferably via electronic means, so that the FX Dealer's credit information can be updated as soon as possible.

Although affirmations of block trade, by themselves, may reduce an FX Dealer's market risk, affirming only the block trade does not provide the essential customer data for the firm's credit and compliance systems. For an FX Dealer to fully understand its counterparty risk, all deals

must be both affirmed and confirmed at the split (counterparty) level.

Best Practice no. 21:
Review Third-Party Advices
FX Dealers should confirm trades which are conducted through a broker directly with one another, unless the parties have agreed that broker advices serve as confirmations . Review of electronic and/or voice broker advices alone should otherwise be used as means of affirming only, rather than confirming, the trade.

Best Practice no. 22:
Automate the Confirmation Matching Process
Electronic confirmation matching and tracking systems should be adopted as standard operating procedures.[14]

Electronic confirmation matching requires that two parties agree to electronically match their confirmations through an in-house proprietary system or a third-party vendor. Electronic confirmation matching is the most reliable method of confirming transactions. Such matching decreases market risk and trade errors, minimizes settlement and compensation payments, and reduces operational and overhead costs. Electronic confirmation matching allows an FX Dealer to increase the volume of transactions confirmed in a timely manner.

The confirmation process should be additionally controlled by establishing an automated confirmation tracking and follow-up system. Such a system will decrease the chances that deals are not settled properly and help management track and escalate outstanding unconfirmed transactions. Moreover, automating confirmation tracking and follow-up enables an FX Dealer to identify counterparties that do not confirm on a regular basis so that they can be addressed. Finally, automation, as opposed to a purely manual system, decreases potential errors caused by human intervention (phone and paper) and reduces operational costs.[15]

Best Practice no. 23:
Establish Exception Processing and Escalation Procedures
Escalation procedures should be established to resolve any unconfirmed or disputed deals. Periodic reports containing transactions that have not been confirmed or affirmed, and counterparties that do not confirm or affirm, should be issued to sales and trading and senior management.

Exposure to market risk arises when trades are not confirmed. To mitigate this risk, standard escalation procedures should be in place to pursue and resolve all discrepancies in a timely manner. Unconfirmed deals may indicate trade entry errors, such as a failure to enter the trade, or that a counterparty did not recognize a trade. Repeated problems may indicate that the counterparty does not execute operational procedures correctly, which may signal the need to

[14] Foreign Exchange Committee, "Standardizing the Confirmation Process," in *The Foreign Exchange Committee 1995 Annual Report* (New York: Federal Reserve Bank of New York, 1996).
[15] Foreign Exchange Committee, "Standardizing the Confirmation Process," in *The Foreign Exchange Committee 1995 Annual Report* (New York: Federal Reserve Bank of New York, 1996).

reevaluate the trade relationship.

Internal procedures should be established (in accordance with any applicable regulations) to monitor unconfirmed trades. When a confirmation is received from a counterparty, and no record of the deal exists internally, operations should immediately establish whether a deal has in fact been conducted by contacting the appropriate person in sales and trading. Operations should then verify the trade information from a related source (for example, electronic or voice broker advices or broker affirmations) or by contacting the counterparty directly. In either case, operations should follow escalation practices regarding unconfirmed trades as outlined by the firm. Any dispute should be resolved expeditiously.
Escalation procedures should also include notification to sales and trading and prime broker where applicable.Senior management should also be informed of unconfirmed deals so that they can evaluate the level of operating and regulatory risk being introduced by maintaining dealing relationships with noncompliant counterparties. Compensating controls—such as sending out periodic statements with all outstanding forward trades—can be implemented, but it must be recognized that such controls do not eliminate the risks inherent with unconfirmed trades.

The segregation of duties between sales and trading, prime broker, and operations can pose special challenges when dealing with exceptions. Under no circumstances should operations concede control of unconfirmed trades to sales and trading. If confirmations are received that operations does not recognize, it is imperative that operations maintain control of such confirmations until either a cancellation or amendment is received. When trades remain unconfirmed, escalation procedures should be strictly followed and senior operations management should formally review any exceptions to policy.

Settlement and Settlement Netting

Process Description

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

Settlement occurs and payments are exchanged on the settlement 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 owed—as well as for expected receipts. Settlement instructions are sent one day before settlement, or on the settlement date, depending on the currency’s settlement requirements. Settlement instructions should include the counterparty’s nostro agent’s name and SWIFT address and account numbers if applicable. Systems generate predictions of expected movements in nostro accounts to help manage liquidity and 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. When an FX Dealer enters into a contract to buy dollars and sell yen, for example, it will credit its yen nostro account and debit its dollar nostro account. The counterparty credits its dollar nostro account and debits its yen nostro account in Japan. Both FX Dealers initiate a money transfer to pay their respective counterparties, which is done by a funds movement between the two FX Dealers using the local payment system. The settlement process is complete when both counterparties have been paid the appropriate amounts.

If settlement error occurs in the process, it can be quite costly. If an FX Dealer fails to make a payment, it must compensate its counterparty, thus generating additional expense. Settlement errors by a counterparty may also cause an FX Dealer's cash position to be different than expected, resulting in overdraft expenses for the FX Dealer.

In addition, settlement risk—the risk that a party makes its payment but does not receive the counter currency it expects—can cause a large loss. This risk arises in FX trading because payment and receipt of counter currency do not always 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.[16]

Sources of this risk include internal operations procedures, intramarket 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 nostro balances and through the establishment of counterparty limits.

A maximum settlement risk limit is usually established for each counterparty.
Notably, the introduction of the CLS Bank, and its payment-versus-payment services, has increased the efficiency of settlement by introducing a mechanism for simultaneous exchange of currencies on an intraday and multilateral basis.

Bilateral settlement netting is the practice of combining all trades between two counterparties due on a particular settlement date and calculating a single net payment in each currency. If, for example, an FX Dealer does twenty-five trades with the same counterparty, all of which settle on the same day, bilateral settlement netting will enable the FX Dealer to make or receive only one or two netted payments instead of twenty-five. The establishment of settlement netting agreements between counterparties may be used to reduce settlement risk, operational risk, and operational costs.

[16] For additional information on settlement risk, please see the following: Foreign Exchange Committee, "Defining and Measuring FX Settlement Exposure," in *The Foreign Exchange Committee 1995 Annual Report* (New York: Federal Reserve Bank of New York, 1996). Foreign Exchange Committee, "Reducing FX Settlement Risk," In *The Foreign Exchange Committee 1994 Annual Report* (New York: Federal Reserve Bank of New York, 1995).

Such an agreement may be a simple one-page document that only supports settlement netting, or the settlement netting provision may be included in a master agreement (see Best Practice no. 3).

Netted payments are calculated for transactions done in the same currencies with equal value dates. The FX Dealer and counterparty continue to confirm all deals either directly or through a system that helps support settlement netting. These systems allow the FX Dealer and the counterparty to view netted amounts of trades on a screen.

Operations should confirm final netted amounts on the day before settlement date in addition to confirming the transaction itself on the trade date (see the confirmation section and Best Practice no. 19).
Any disputes should be investigated and resolved between an FX Dealer's and counterparty's operations units.

Multilateral settlement netting is the practice of combining all trades between multiple counterparties and calculating a single net payment in each currency. This practice is supported by CLS Bank (CLS). CLS Best Practices can be found on the website <www.cls-services.com>.

Best Practice no. 24:
Understand the Settlement Process and Settlement Exposure and Use Settlement Services Wherever Possible to Reduce Settlement Risk within the Market

Market participants should measure and monitor settlement risk exposures. All senior managers should obtain a high- level understanding of the settlement process as well as of the tools that exist to better manage settlement risk. Additionally, both credit and risk managers (those managing position risk and credit risk) should be cognizant of the impact their internal procedures have on settlement exposure.

Settlement risk may be reduced if those involved in the process better understand the ramifications of its possible failure. Senior management, sales and trading, operations, risk management, and credit management should understand the settlement process and be aware of the timing of the following key events in the process: when payment instructions are recorded, when they become irrevocable, and when confirmation of counterparty payments are received with finality. Knowledge of these items allows the duration and amount of FX settlement exposure to be better quantified.
Both credit and risk managers should develop timely and accurate methods to quantify settlement risk.
A party's actual exposure when settling an FX 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.[17]
Market participants should adequately utilize settlement services that reduce their exposures to settlement risk whenever possible, for example, through the use of payment-versus-payment services, such as those offered by CLS, for the settlement of eligible foreign exchange transactions. Market participants currently unable to use such services should be encouraged to consider ways to use them.

Best Practice no. 25:
Use Real-Time Nostro Balance Projections
Nostro balance projections should be made on a real-time basis and should include all trades, cancellations, and amendments for each tenor (value date).

An FX Dealer is exposed to risk when managing its nostro funds if expected cash positions vary greatly from actual cash positions. If more cash is needed than the balance in an account, the FX Dealer will incur overdraft costs to fund the positions. Continual overdraft balances will generate expenses for the FX Dealer and may cause operational difficulties when the FX Dealer makes efforts to determine why errors occurred.

Best Practice no. 26:
Use Electronic Messages for Expected Receipts
An FX Dealer should send its nostro banks an electronic message that communicates its expected receipts.

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 aids in the formulation of escalation procedures. This process can help an FX Dealer 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 the number on its outgoing nostro activity statement.

Some nostro banks, however, are not equipped to process these expected receipt messages. Given the benefits that accrue through the use of expected receipt messages, an FX Dealer should consider a nostro's ability to process these messages when choosing which nostro bank to use.

Best Practice no. 27:
Use Automated Cancellation and Amendment Facilities
An FX Dealer should establish a real-time communication mechanism with its nostro bank to process the cancellation and amendment of payment instructions.

An FX Dealer may need to change or cancel payment instructions after they have been released to nostro banks. Problems may arise if this information is not processed in a timely manner. Amendments occur when 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 certainly create an improper settlement, the FX Dealer needs to be sure the amendment is acted upon so that its nostro balance predictions are accurate. More importantly, an FX Dealer may wish to cancel a payment instruction if it is reasonably confident that a counterparty may not fulfill its obligation to pay the counter-currency.

An automated feed from the operations system to the nostro bank will make communi-cation of amendments and cancellations easier. Nostro banks will be able to establish later deadlines for payment amendments because a real-time link provides more time to process the changes. Such a link also decreases the chance that an FX Dealer will miss the payment deadline and should prevent incorrect payments from being released.

Best Practice no. 28:
Implement Timely Payment Cutoffs
Management should work to achieve the latest possible cut-off times to release payment messages, to ensure that cancellations and amendments of payment instructions are included in communications to the nostro bank.

By eliminating restrictive payment cancellation deadlines and shortening the time it takes to identify the final and failed receipt of currencies, an FX Dealer can lower its actual and potential settlement exposure. An FX Dealer should understand when it can unilaterally cancel or amend a payment instruction and negotiate with its nostro banks to make this cutoff as late as possible. In addition, such policies give an FX Dealer more control over its payments, allowing it to react to any problems that arise late in the settlement process.

Best Practice no. 29:
Report Payment Failures to Credit Officers
Operations should ensure that credit reports appropriately update settlement exposure resulting from projected cash flow movements. Exposure amounts should include any failed receipts from previous transactions.

To properly manage its credit risks, an FX Dealer needs to monitor settlement exposure to each of its counterparties. Settlement exposure exists for a FX transaction from the time that the payment instruction issued by the FX Dealer 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. Therefore, credit officers need to know the projected settlement amounts for each counterparty. In addition, any nonreceipts should be included in current exposure amounts reported to the credit officers. Nonreceipts indicate an increased exposure to the counterparty until the amount has been paid, and may also suggest a more serious problem with the counterparty.

Best Practice no. 30:
Use Automated Settlement Netting Systems

The use of an automated settlement netting system which is visible by both parties is encouraged to calculate net payments in each currency by settlement date.

All parties should use integrated software capable of capturing trade information real time and automatically calculating netted payments. Such a system should confirm each individual transaction, and calculate by settlement date, on a currency-by-currency basis, the net amount due to or from each counterparty. These systems should electronically confirm with the two counterparties the net settlement amounts and if these amounts are not equal the resulting discrepancy should be resolved immediately. The confirmation of each transaction should have been completed prior to agreeing net settlements. The parties should agree in their master agreements to net settle all transactions if they agree to settlement netting.

Using automated (real time) settlement netting systems also helps to reduce settlement risk. Because automated (real time) settlement netting systems allow all parties to quickly identify and correct errors, currency exposures on settlement date can be managed more effectively. For example, if a party conducts ten trades (within the same currency) with a counterparty, it will only be exposed to settlement risk with that counterparty 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 additional trades are confirmed, the resulting amounts should be added to the net settlement exposure until such time when the two parties net settle. Once trades are settled either a new net settlement amount is calculated or gross settlements may occur.

Best Practice no. 31:
Affirm Bilateral Net Amounts
Final amounts should be affirmed bilaterally.

If both parties use the same third-party automated (real time)settlement netting system, that system should electronically affirm to both parties the net amount that they owe and can expect to receive at some predetermined cutoff time. This affirmation process is critical to protect against an improper settlement of a net amount.

Best Practice no. 32:
Employ Timely Cutoffs for Settlement Netting
All parties should adopt the latest cutoff time possible for affirming net settled trades. Credit system functions should be in place to accurately reflect the effect of legally enforceable netting arrangements.

To include all transactions done between two counterparties with the same settlement date and achieve the maximum settlement risk reduction, the net settlement amounts should be affirmed at the closest possible time to settlement in accordance with cash clearing and internal controls in each relevant region. All parties are encouraged to establish cutoff deadlines for affirming net settlement amounts for a particular date with each of its counterparties. As netting occurs and other trades are done with the counterparty, credit systems' monitoring of settlement exposure should be updated promptly. Credit systems should be adapted to account for legally enforceable netting agreements and should reflect changes in settlement limit usage appropriately. This allows sales and trading personnel to appropriately deal with counterparties

based on available settlement limits and to assess the risk associated with each trade on a real time basis. Affirmed trades that miss the agreed settlement netting cutoff deadlines should be settled gross and reflected as such for credit purposes.

Best Practice no. 33:
Establish Consistency between Operational Practices and Documentation
Management should ensure that operating practices are consistent with credit policies and other documentation. Credit systems should not reflect settlement netting benefits unless documentation exists to support settlement with counterparties on a net payment basis.

Operations management should strive to establish procedures that are in line with operational goals and to follow those documented procedures. Management should ensure that operational procedures allow for settlement netting to be carried out between an FX Dealer and designated counterparties where agreed between those counterparties and where legally permitted. Operations should also ensure that trades designated for net settlement are reflected in the appropriate systems so that netting is successfully executed. The operational procedures should include any necessary cut-off times, standing settlement instructions (SSIs), and an agreed method of affirmation and confirmation should be supported by each counterparty's documentation policy.

Best Practice no. 34:
Prepare for Crisis Situations outside Your Organization
Operations employees should understand the procedures for crisis situations affecting settlement. They should know who to notify if payments must be amended or canceled or if settlement procedures must be changed.[18]

Crisis situations such as a failure of an FX Dealer's settlement processing systems, potential bankruptcy, or political unrest present critical decisions for an FX Dealer, especially with regard to credit and liquidity management. Firms should anticipate crises and prepare internally. An FX Dealer's failure to properly manage its settlement processes with counterparties could prove harmful if a counterparty defaults on the expected payments. Consequently, operations should understand and properly plan for what to do in a crisis. Current nostro bank staff contact lists should be distributed. These lists should contain emergency contact numbers and contact information for each nostro bank's contingency operation.

Operations should also understand alternative settlement procedures and how they are executed. Finally, operations staff should know who to inform and how to inform them of changes or cancellations in payment instructions. An FX Dealer may wish to consider simulated exercises of crisis situations to ensure that employees are familiar with alternative procedures and can manage them effectively.

[18] Foreign Exchange Committee, "Reducing FX Settlement Risk," In *The Foreign Exchange Committee 1994 Annual Report* (New York: Federal Reserve Bank of New York, 1995).

Nostro Reconciliation

Process Description
Nostro reconciliation occurs at the end of the trade settlement process to ensure that a trade has settled properly and that all expected cash flows have occurred. An FX Dealer should begin reconciliation as soon as it receives notification from its nostro bank that payments are received. If possible, reconciliation should be performed before the payment system associated with each currency closes. Early reconciliation enables an FX Dealer to detect any problems in cash settlement and resolve them on the settlement date. Typically, however, an FX Dealer does not receive notification from its nostro banks until one day after settlement, which does not allow them to correct payment errors on the settlement date.

Reconciliation begins with the prediction of cash movements. The FX Dealer's operations unit identifies those trades that are valued for settlement the next business day. Operations aggregates all payments for that value date, taking into account netted payments and determining what the expected cash movement will be for each of its nostro accounts. This process allows the FX Dealer's to accurately fund those 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 comparing expected cash movements with 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. An FX Dealer may have

- expected to receive funds and did not,
- expected to receive funds and received the wrong amount,
- received funds and did not expect to receive them,
- expected to pay funds and did not,
- expected to pay funds and paid the wrong amount, or
- paid funds and did not expect them to be paid.

If any differences are found, the FX Dealer 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 such errors can be avoided if the confirmation process is followed without exception. If the discrepancy was caused by an error at the FX Dealer, then the FX Dealer must arrange to pay the counterparty with good value or to pay the counterparty compensation. Similarly, if the error occurred at the counterparty or at the nostro bank, then the FX Dealer 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 may not reconcile with the positions that the liquidity management team is due to fund. This may result in the potential for inefficient liquidity/risk management, overdraft charges, compensation claim impact, and possible regulatory action. In addition, nostro reconciliation serves as a main line of defense in detecting fraudulent activity.

FX Dealers should implement procedures to periodically review the terms and conditions of each nostro agent and evaluate usage of each nostro account.

Best Practice no. 35:
Perform Timely Nostro Account Reconciliation
Full reconciliation of nostro accounts should be completed as early as possible.

An FX Dealer should attempt to establish capabilities that allow for intraday processing of nostro confirmations of receipts, thereby allowing the reconciliation process to begin before the end of the day. In no instance, however, should the reconciliation be done later than the day following settlement date. The sooner reconciliations are performed, the sooner an FX Dealer knows its true nostro balances so that 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 an FX Dealer can prevent further payments from being made to that counterparty.

Best Practice no. 36:
Automate Nostro Reconciliations
An FX Dealer should be capable of receiving automated feeds of nostro activity statements and implement automated nostro reconciliation systems.

An FX Dealer should establish facilities for automatically downloading the settlement information it receives from nostro banks as well as its own expected settlement data. An FX Dealer 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 and initiated to deal with any unreconciled trades and/or unsettled trades.

Best Practice no. 37:
Identify Nonreceipt of Payments
Management should establish procedures for detecting non-receipt of payments and for notifying appropriate parties of these occurrences. Escalation procedures should be in place for dealing with counterparties who fail to make payments.

An FX Dealer 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. An FX Dealer should also report nonreceipts to credit management and to sales and 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 FX Dealer. The processing of interest and penalties should be prompt.

Best Practice no. 38:
Establish Operational Standards for Nostro Account Users

An FX Dealer should require all other users of its nostro accounts to comply with the same operational standards as FX users.

The FX department of an FX Dealer may be the primary user of nostro accounts. However, other business groups (for example, fixed income, commodities, emerging markets, and derivatives) may also be users. Clear procedures should be established outlining how each account is funded (that is, individual or group funding). Consistent standards should be in place describing the necessary operating procedures that all users should follow. Without clear rules for sharing in place, the FX Dealer runs the risk of overdraft problems.

Accounting/Financial Control

Process Description

The accounting function ensures that FX transactions are properly recorded to the balance sheet and income statement. If transaction information is not recorded correctly, *an FX Dealer's* reputation may be impaired if material restatements of financial accounts are necessary.

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. There are two common methods for transferring and validating P&L information in the general ledger.

In some FX Dealers, the sales and trading system compiles all of this data and develops a P&L figure for each day. An independent control function later verifies the P&L figure. Other FX Dealers calculate two P&L figures independently: one is calculated by sales and trading, and one by the operations system. An independent party, such as the risk management division, verifies both P&L figures. Each morning, the P&L of the prior day's business is verified by the financial management function and analyzed by senior management.

The accounting area should ensure that following the 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 that are fed into the general ledger and the daily P&L. Once these positions are 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 daily by a function independent from the trading desk. Additionally, an independent check and attestation is done to ensure that all subsystem accounts reconcile to the general ledger accounts on a monthly basis, at a minimum. All discrepancies are investigated as soon as possible to ensure that the FX Dealer's books and records reflect accurate information. In addition, all discrepancies that have an impact on how the FX Dealer 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 an FX Dealer'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 that the general ledger accurately reflects business activities; the change flows to the operations system where appropriate cash flow adjustments are made.

Best Practice no. 39:
Conduct Daily General Ledger Reconciliation
Systematic reconciliations of 1) the general ledger to the operations system, and of 2) sales and trading systems to the operations systems should be done daily.

Timely reconciliations will allow for prompt detection of errors in the general ledger and/or sub-ledgers and should minimize accounting and reporting problems. This reconciliation will ensure that 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. 40:
Conduct Daily Position and P&L Reconciliation
Daily P&L and position reconciliations should take place between the sales and trading and operations systems.

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

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

Best Practice no. 41:
Conduct Daily Position Valuation
Position valuations should be verified daily by a staff that is separate from sales and trading. Preferably, position valuation should be conducted by an independent third party such as the risk management staff. Position valuation should be checked against independent price sources (such as brokers or other FX Dealers). This is particularly important for FX Dealers that are active in less liquid forward markets or in exotic options markets. Trading management should be informed of the procedures used for marking to market to ensure that they can appropriately manage trade positions.

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 by an independent source. Either operations or risk management should check that the rates and prices used by sales and trading for end-of-day valuation are close to the market rates.

Position valuations should be verified using independent sources such as market rate screens, other dealers, and/or broker quotations. In addition, at least once a month, the results of the models should be checked against other dealers and/or brokers to ensure that the valuations produced by the FX Dealer's models are consistent with other dealers.

Illiquid markets present additional risk to an FX Dealerbecause illiquid instruments are infrequently traded, making them difficult to price. Often, it is hard for an FX Dealer 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, an FX Dealer should seek to obtain quotes from other counterparties active in the market. Management should be aware of these procedures so that they may effectively manage and evaluate illiquid market positions. These procedures allow an FX Dealer to mark to market its positions and to evaluate associated risks. All market participants should be aware that an FX option portfolio is not effectively marked to market unless the valuation reflects the shape of the volatility curve. With consideration given to the size of portfolio and daily activity, positions should wherever possible be revalued reflecting the "smile effect" when the firm wishes to mark to market. Where appropriate, firms should reserve against liquidity and pricing risk.

Marking to market reflects the current value of FX cash flows to be managed and provides information about market risk.[19] 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. 42:
Review Trade Prices for Off-Market Rates
Trade prices for both internal and external trades should be independently reviewed to ensure reasonableness within the market prices that existed on the trade date.

Any trades executed at prices not consistent with the market rates that existed at the time of execution may result in an error for the FX Dealer or may unduly enrich the FX Dealer or the counterparty. FX Dealers should institute a daily procedure that provides for independent manual or automated review of trade prices versus prevailing market rates.

Best Practice no. 43:
Use 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

[19] Group of Thirty, Global Derivatives Study Group, *Derivatives: Practices and Principles* (Group of Thirty, 1993), p.19.

rates and prices, an FX Dealer should establish electronic links from the systems that source the rates and price information to the position valuation systems.

Unique Features of Foreign Exchange Options and Non-Deliverable Forwards

Process Description
Foreign exchange (FX) options and non-deliverable forwards (NDFs) have unique features that need to be handled differently than spot and forward FX transactions. Specifically in the areas of

- option exercise and expiry,
- rate fixings for NDFs and some nonvanilla options, and
- premium settlements for options.

Options exercise/expiry requires the determination of the intrinsic value of the instrument. The intrinsic value is the amount by which the option is in-the-money. To determine this value, the strike price of an option must be better than the market rate at the time of expiration. This special event is one of the unique features of options. Options have inherent risk associated with failure to perform events such as exercising in-the-money transactions or obtaining fixings for non-vanilla options (such as average rate or average strike). Senior operations management should clearly define roles and responsibilities to ensure that these inherent risks are reduced.

NDFs, much like options, also require additional processing. NDFs are cash-settled FX instruments that require a rate fixing to determine the cash settlement amount. Daily review of outstanding transactions must be performed to ensure that fixings are obtained as required in the confirmation language. Fixings are communicated by notification of a fixing advice. Responsibility for the notification of the fixing advice should be part of the confirmation process and performed by operations personnel.

The confirmation process for both FX options and NDFs is comparable to straight FX trades. The difference is that FX options and NDFs require additional language and staff must understand more than the usual terms and conditions in order to reduce operational risk. Please see Appendix A for a matrix highlighting the relevant messaging fields for various FX product types. In all other respects, FX options and NDFs should be treated the same way as spot and forward FX trades as outlined in this document.

Best Practice no. 44:
Establish Clear Policies and Procedures for the Exercise of Options
FX Dealers should have clear policies and procedures that define roles and responsibilities and describe internal controls on the process of exercising and expiring foreign currency options.
FX Dealers should mitigate operational risk by implementing policies and procedures in conjunction with oversight departments and by assigning clearly defined roles and responsibilities. Option exercise and expiry should be completed on a timely basis, with impacts to risk and profit and loss being managed by the front office. Subsequent

communication (internal or external) of the event should be timely in order to facilitate event management, client communication, and settlement.
Additionally, to reduce operational risk, systems should be designed to automatically exercise or expire transactions as appropriate. Oversight is necessary in the form of measuring options against market rates, thereby ensuring that in-the-money transactions are exercised appropriately. Foreign exchange trades resulting from exercised options should automatically and electronically flow to the back-office FX processing system if a separate application is used from the option processing system.

Best Practice no. 45:
Front Office and Operations Staff Should Work Together to Support Effective Notification of Barrier Life Cycle Events

The Barrier Determination Agent is responsible for notifying the other party to the Transaction (or both parties to the Transaction, if the Barrier Determination Agent is not a party to the Transaction) of the occurrence of a Barrier Event relating to the Transaction. This notice can be provided by telephone, facsimile transmission that is acknowledged by the receiving party, or other electronic notification. If there is a failure to give such notice, it shall not prejudice or invalidate the occurrence or effect of such event.

Although there is no legal requirement to notify counterparties of the occurrence of a Barrier Event, current practice is for the Initial Notification of such events to occur at the Trading desk level. In addition, a Secondary Notification should be provided on the Operational side, initially through issuance of paper (at a minimum) or standard electronic messaging and, possibly later, full electronification if the industry is able to leverage new infrastructure developed in the context of meeting applicable central clearing requirements.

Best Practice no. 46:
Obtain Appropriate Fixings for Nonstandard Transactions
Ensure that nonstandard transactions (such as non-deliverable forwards [NDFs], barrier, average rate, and average strike options) with indexing components are fixed with the appropriate rates as provided in the language of the confirmation or master agreement documentation.

Operations staff, independent of sales and trading, should obtain the fixing rates as defined in the confirmations for all nonstandard transaction types (such as NDFs, average rate, average strike option trades). Confirmations should be reviewed on the trade date to determine the fixing source. This fixing information should be captured by the back-office operational transaction processing system and noted on the individual confirmations. On the fixing date, fixing advices should be generated and forwarded electronically (where possible) to the counterparty reflecting the fixing rate and settlement amount.

Best Practice no. 47:
Closely Monitor Option Settlements
Option premium settlements should be closely monitored to reduce the potential for out-trades.

Premium settlement of options should be monitored closely to reduce the potential for out-trades.

Option premium amounts can be small and not reflect the notional amount of the option transaction. Ensuring that the counterparty receives the settlement of the premium can be an indication that the counterparty is aware of the position, albeit not the details of the trade, which would be covered in the confirmation.

General Best Practices

Process Description
This section suggests general best practices that apply to all segments of the FX process flow.

Best Practice no. 48:
Ensure Segregation of Duties
The reporting line for operations personnel should be independent of the reporting line for other business lines (sales and trading, credit, accounting, audit, and so on). For key areas, operations management should ensure that an appropriate segregation of duties exists within operations and between operations and other business lines.

Operations cannot be completely effective in performing its control functions if its members report to an area that they are assisting. Operations must be able to report any and all issues to an independent management team. To do so, operations must have a reporting line that is not directly subject to an organizational hierarchy that could lead to a compromise of control. In addition, the compensation process for operations personnel should be clearly segregated from that of the compensation process of sales and trading.

Examples of good practices include:

- precluding individuals from having both trading and confirmation/settlement responsibilities concurrently,
- precluding sales and trading personnel from issuing and authorizing payments,
- precluding individuals from having both posting and reconciling access to the general ledger,
- not allowing established procedures to be overridden without operations management's consent, and
- separate database functions between sales and trading and operations.

Best Practice no. 49:
Ensure That Staff Understand Business and Operational Roles
Operations and sales and trading personnel should fully understand all FX business strategies and the role of each participant within the FX process flow (for example, clients, credit, compliance, and audit). Policies and procedures should be documented and updated periodically.

Business strategies, roles, responsibilities, and policies and procedures continually change and evolve. Each group or individual playing a role in the FX process flow should have a complete understanding of how FX trades are initiated, processed, confirmed, settled, controlled, and accounted. Insufficient knowledge of the overall FX process, or the role played by each individual or group, can lead to an improper segregation of duties, insufficient controls, and/or increased risk. All market participants should provide continuous employee education regarding business strategies, roles, responsibilities, and policies and procedures. The development of effective "front-to-back" training should be encouraged to ensure that all elements of the FX business are clearly understood by all. All market participants should insure that policies and procedure documents are current, documented, maintained, and available to all.

Best Practice no. 50:
Understand Operational Risks
Market participants should fully understand operational risks.[20] *To help mitigate operational risks, every market participant should implement adequate controls, modify processes and flows when appropriate, and/or invest in improved technology. Current as well as potential operational risks associated with new industry process changes (for example, the CLS Bank, web portals, and so on), should be assessed on a regular basis, quantified wherever possible, and reported to senior management.*

Areas of exposure within the FX processing cycle need to be identified, quantified where possible, and adequately controlled. With better information regarding operational risks, institutions can make informed decisions about which risks they are going to assume and which risks need to be managed either through enhanced process flows and controls or through investments in improved technology. Proactive thinking concerning current and future trends is recommended.

Best Practice no. 51:
Institute a Robust Framework for Monitoring and Managing Capacity in both Normal and Peak Conditions

The best practices listed below set out the minimum standards that firms participating in the FX market should aim to achieve with regard to capacity management.

Best Practice 51.a: An FX Dealer should have **sufficient technical and operational capability employed to ensure a firm's end-to-end FX processing can take place in both normal and peak market conditions without undue impact on its processing timeline. In particular:**

- Projected average/peak business volumes and the time periods in which these are likely to occur and must be processed in (both outbound and inbound) should be clearly defined. Similarly, the peak duration (the length of time where peak input processing must be sustained) should also be defined;

[20] See the "What Is Operational Risk?" in this document, p. 3.

- Sufficient scalable end-to-end technical capacity and associated operational resources should be employed to achieve the above measures at all times (with appropriate contingency headroom built in to reflect an institution's business profile). This is likely to involve not only the firm's own systems (e.g. Trade Capture, Confirmation, Operations processing, Finance, Risk) but other aspects of connected external infrastructure such as networks and vendors/service providers;
- For firms whose business profile may include high volume trading, consideration should be made with respect to the use of aggregation tools for consolidating trade volumes.
- The end to end FX operational capabilities of a firm should be commensurate or exceed its front office capabilities
- For firms operating from multiple locations or business lines, this capability should exist wherever trade generation may occur;
- The capability should accommodate failure or Disaster Recovery scenarios where an institution may need to "catch up" on trade data not processed whilst either recovering from system problems or when falling over to its standby facilities.
- End-to-End Testing (on appropriately scaled architecture) should be employed to prove the above. Such testing should take place at least annually, including with external vendors

Best Practice 51.b: **Clearly defined Capacity and Performance Management processes should be in place. In particular:**

- Robust modeling processes should exist, utilising both historic analysis and projections of business generation, whereby future volumes (3-6, 12 and 24 month periods) are predicted as accurately as possible for both standard and peak business flows on a monthly, daily and intra-day (up to hourly) basis (thereby capturing routine variations in trade flow patterns where appropriate);
- Appropriate change management and technical planning processes should be present to ensure that any changes arising from the above are deployed at least six months ahead of the anticipated requirement date with appropriate resources. Front office management should be engaged with operations areas in the planning and implementation of these processes.;
- This process should be iterative and should take place, at a minimum, on an annual basis (and for large firms every six months);

A comprehensive, documented performance and capacity framework should exist describing all the processes outlined above. The framework should be constructed, maintained, reviewed and endorsed on an annual basis by both operations management and the front office. This framework should be "owned" at an appropriately senior level within the relevant areas of firms.

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Best Practice 51.c: **Defined mechanisms should be in place to respond to extreme changes in demand**

It is possible that either in-house system failures or extreme swings of market volatility may cause volume/throughput surges and associated backlogs that may exceed those peak capabilities that a firm may have employed. Firms should ensure that appropriate real-time monitoring mechanisms are in place to detect trading volume build-up to provide as much "reaction time" as possible. Firms' processes should recognise the possibility of surges of trading volume and put in place appropriate measures to safeguard both their systems and the impact on the operation of the system as a whole. Such processes could include the ability to:

- Prioritise trade processing as appropriate and to manage internally any build-up of spot/future dated trades so that they can be subsequently submitted in a controlled fashion over an extended period;
- Dynamically monitor volume trends, via real time reporting and tracking, including external vendors, to identify *significant changes in volume profiles (either up or down) and, especially, to identify* surges whose profile would exceed existing peak capacity;
    - Have in place appropriate crisis management and invocation processes so that defined (and expeditious) actions can be taken should volume trends indicate that planned peaks may be exceeded. Examples may include limiting the trade generation volume so that it does not threaten to exceed the technical capabilities of other systems within the firm; and the introduction of additional capacity and performance "on demand".

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Best Practice no. 52:
Identify Procedures for Introducing New Products, New Customer Types, or New Trading Strategies
All market participants should have adequate procedures and controls in place for introducing new products, new customers types, or new trading strategies. These procedures and controls should include a provision to ensure that the participant has the capability to initiate, price, value, confirm, and settle these new types of transactions, customers, or strategies. The market participant should also be able to measure, monitor, and report all risks associated with new products, customers, or strategies.

When a new product, new customer, or new business strategy is introduced, all areas-operations, sales and trading, financial control, risk control, legal, compliance, technology, and others—should be fully knowledgeable and prepared to execute and process the new dealings in a controlled environment. New products, new customer types, or new business strategies may introduce different types of risks or increase existing risks. They may also result in different methods of trade capture, confirmation, netting, settling, reconciling, and/or P&L reporting. Any change to existing processes, practices, or policies should be effectively controlled and reported. Procedures and controls that detail operational and systems support guidelines should be documented and published.

Best Practice no. 53:

Ensure Proper Model Sign-off and Implementation

Quantitative models often support FX trading activities. As a result, their implementation and management should be a coordinated effort among the various FX business lines. Model implementation and maintenance should ensure that all FX business lines (Sales & Trading, Operations, financial control, risk control, technology, audit, and others) approve, support, and understand the model purpose and capabilities, as well as the roles and responsibilities of each business line. Further, to maintain appropriate segregation of duties, model validation, model technical development, and data input and output reporting should all be performed independently from Sales & Trading.

Models may be used to report positions, to manage position risk, or to price financial instruments. New models, or modifications to existing models, may change or challenge established policies, procedures, and/or practices. It is important that all FX business lines understand how the pricing of certain instruments will change and how position monitoring will be evaluated if a new model is introduced or an existing model modified. Model risk and potential business disruptions can be effectively controlled through cross business line approval, implementation, management, and education.

Best Practice no. 54:

Control System Access

Users of a system (for example, operations, sales and trading) should not be able to alter the functionality of production systems. Developers should have limited access to production systems, and only in a strictly controlled environment. Each system should have access controls that allow only authorized individuals to alter the system and/or gain user access. Function-specific user access "profiles" are suggested.

As alternative technologies (for example, web-based trading) continue to emerge in the FX trading and processing environments, rigorous controls need to be implemented and monitored to ensure that data integrity and security are not sacrificed. External user access controls should be as robust as internal user access controls.

Access to production systems should only be allowed for those individuals who require access in order to perform their job function. When creating user access profiles, system administrators should tailor the profile to match the user's specific job requirements, which may include "view only" access. System access and entitlements should be periodically reviewed, and users who no longer require access to a system should have their access revoked. Under no circumstance should operations or sales and trading have the ability to modify a production system for which they are not authorized.

Best Practice no. 55:

Establish Strong Independent Audit/Risk Control Groups

Market participants should have sophisticated and independent audit/risk control groups. It is recommended that market participants perform rigorous self-assessments and publish regular reporting of such to management, the business line, and audit/risk control groups. Firms should

implement policies and procedures that enable employees to raise concerns anonymously.

The audit/risk control groups play a most important role. They ensure that quantifiable and effective controls are in place and working properly and that policies and procedures are relevant as well as followed. The goal of these groups is to protect the market participant against financial or reputation loss by monitoring or uncovering flaws in the process or procedures and suggesting corrective action. These groups must not have a reporting line that is subject to an organizational hierarchy that could lead to a compromise of control, assessment, or escalation.

Best Practice no. 56:
Use Internal and External Operational Performance Measures
Operational performance reports should be established to clearly measure and report on the quality of both internal and external (outsourced) operational performance. The report measurements should focus on operational efficiency and controls, and be reviewed on a regular basis by both operations and sales and trading management.

Operational performance reporting should contain quantifiable performance metrics at the levels of detail and summary, and indicate the status of operational activities. Typical key performance measures would include confirmation, acceptance and aging reporting, nostro and cash balance reporting, operational error and loss reporting, and any other relevant data deemed necessary by the participant. These reports should serve to control and proactively monitor risk and performance.

Market participants may employ Service Level Agreements (SLAs) as a way of improving and controlling operational performance. SLAs should always be exchanged when outsourcing all or part of a participant's operation. SLAs should clearly define, measure, and report on operational performance. External (outsourced) performance measurements should be as robust as internal performance measurements.

Best Practice no. 57:
Ensure That Service Outsourcing Conforms to Industry Standards and Best Practices
If an FX Dealer chooses to outsource all or a portion of its operational functions, it should ensure that its internal controls and industry standards are met. An FX Dealer that outsources should have adequate operational controls in place to monitor that the outsourcer is performing its functions according to agreed-upon standards and industry best practices.

An FX Dealer may choose to outsource some or all of its operations functions. However, outsourcing should in no way compromise an FX Dealer's internal standards for confirmations, settlement and payments. Controls should be in place to monitor vendors to ensure that internal standards are met. For example, trades should still be confirmed in a timely manner and proper escalation and notification procedures must be followed.

Best Practice no. 58:
Implement Globally Consistent Processing Standards
When an FX Dealer has multiple processing centers, it should ensure that firmwide standards

are met in each location. FX Dealers should use consistent procedures and methodologies throughout the institution. Satellite offices or separate entities require close oversight to ensure that they conform to the standards of the FX Dealer.

Some FX Dealers may maintain multiple processing centers in different locations around the world. Regional processing may allow a firm to maintain around-the-clock processing for multiple front-end trading locations. However, it is essential that a firm's standards and processes are consistent throughout the FX Dealer. Although different processing centers may rely on different systems or technology, the standards and procedures should be the same in every processing center. For example, valuation methodologies should remain consistent throughout the firm.

In addition, some firms may rely on centralized booking and operations, but may have specific exceptions, such as satellite offices, or branches that serve as separate legal entities. Such sites should be carefully monitored to ensure that their FX Dealer's standards are being met.

Best Practice no. 59:
Maintain Records of Deal Execution and Confirmations and Maintain Procedures for Retaining Transaction Records
FX Dealers should maintain documentation supporting the execution of foreign exchange trades and each institution is responsible for retaining adequate records of all transactions and supporting documentation for the financial statements. Such documentation should provide a sufficient audit trail of the events throughout the deal execution, trade, and validation process. This documentation may be in the form of written or electronic communication, a tape recording, or other forms evidencing the agreement between the parties. Documentation should cover communication not only between the sales and trading groups of the FX Dealer and the counterparty but also between the operations area of the FX Dealer and the counterparty.

Deal execution and confirmation documentation can aid institutions in verifying trade details and ensure that amounts were confirmed as expected. This step may help an FX Dealerif it becomes involved in counterparty disputes. For each trade, the following information should be documented: currencies, amount, price, trade date, settlement date and the notional currency of each transaction.

It is important to note that trades conducted over the telephone pose particular risks. The phone conversation is the only bilateral record of the trade details, at least until the trade is validated through the traditional confirmation process. Until this confirmation process is completed, market participants should establish close controls to minimize the exposure inherent in such trades

The length of time that an FX Dealer keeps records (which may be left to management's discretion) depends on the type of business they transact and may also be subject to local regulations. Record retention, for example, may depend on the character of an FX Dealer's forward trading or long-dated options trading.
Institutions must maintain detailed records of all transactions executed and of all information to support its P&L and position calculations. Each market participant should determine appropriate

record retention based on tax, regulatory, and legal requirements for each jurisdiction. It is recommended that records be maintained in duplicate and in a location separate from where primary processing occurs.

If and when external vendors or storage facilities are employed, it is essential that they provide a similar backup facility. Records can be maintained on paper, optical, or magnetic media. If a computer-based format is used, the programs and their documentation need to be retained so that the data can be read at a later date. Special care must be taken because newer versions of software frequently cannot read older data files. Older programs may also not run correctly on newer operating systems or machines. In addition, magnetic media must be maintained carefully because it degrades in adverse conditions.

Best Practice no. 60:
Develop and Test Contingency Plans
Operations and sales and trading should develop plans for operating in the event of an emergency. Contingency plans should be periodically reviewed, updated, and tested. These contingency plans should cover both long-term and short-term incapacitation of a trading or operations site, the failure of a system, the failure of a communication link between systems, or the failure of an internal/external dependency. These plans should include informing, monitoring, and coordinating personnel.[21]

The primary risk of a major disaster is that a market participant may not be able to meet its obligation to monitor its market positions. Many market participants deal in high volumes of large trades. Failure to be able to trade or settle transactions from a given center (or several trading centers in the case of centralized operations processing) could subject the market participant to severe financial and reputational repercussions.

Market participants should identify various types of potential disasters and identify how each may prohibit the participant from satisfying its obligations (that is, issuing and receiving confirmations, performing settlements, and completing daily trading). Disaster recovery plans should identify requisite systems and procedural backups, management objectives, people plans, and the methodology or plan for dealing with each type of disaster. Disaster recovery plans should be reviewed on a regular basis, and tested periodically, to gauge the effectiveness of the plans themselves and measure staff readiness.

An emergency crisis team, equipped with key personnel contact lists, should be established to monitor crisis and coordinate recovery efforts. Market participants should develop contingency contact lists (for both internal and external dependencies) and distribute them to employees. All

[21] Additional guidance on foreign exchange contingency planning is provided by Foreign Exchange Committee, "Contingency Planning: Issues and Recommendations," In *The Foreign Exchange Committee 2001 Annual Report* (New York: Federal Reserve Bank of New York, 2002). Several regulatory bodies offer guidance on firm wide contingency planning. The Federal Reserve Bank of New York offers guidance at <http://www.newyorkfed.org/bankinfo/circular/10952.pdf>. Broker/dealers may look to several documents from the Securities and Exchange Commission and the Securities Industry Association for guidance, including <http://www.sec.gov/divisions/marketreg/lessons learned.htm> and <http://www.sia.com/business_continuity/pdf/bestpractices.pdf>

personnel should know whom to contact in the event of a disaster. Market participants should also maintain emergency contact information to reach primary counterparties. Counterparty information records should include contingency site phone numbers and emergency contact information for key personnel.

Backup sites that can accommodate the essential staff and systems of operations and sales and trading should be set up, maintained, and tested on a regular basis. Particularly for operations, market participants should consider developing a backup site that relies on a separate infrastructure (electricity, telecommunications, etc.) and an alternative workforce. Banks may want to leverage multiple processing sites to serve as emergency backup facilities in the event of an emergency. In case of primary system failure, backup systems should be available and capable of acting as primary systems. These systems should provide for payment and settlement as well as the monitoring and managing of both position and settlement risk. Backup systems should have access to current and historical data which should be backed-up in a separate location from the primary site.

Market participants' business continuity plans should take into consideration the technical support requirements of their critical processing systems. Backup sites should be able to access critical confirmation and netting systems, key liquidity providers, and other industry utilities. Business continuity plans should also consider the recovery capabilities of critical service providers, in particular, their clearing and third party settlement banks.

Additionally, all market participants should identify and practice alternative methods of confirmation and settlement communication with nostro banks. These methods may require the use of fax or telex to ensure proper processing.

During a disaster, an FX Dealer should notify its counterparties of potential processing changes. An FX Dealer should also provide counterparties with current contact information for key personnel to ensure that counterparties can contact the FX Dealer in an emergency.

Market participants should ensure that the communication tools used by operations and sales and trading are secure. If phone systems fail, backup systems should exist. For example. cellular or non-private bank exchange (PBX) phones. All market participants should be connected to multiple phone substations to further prepare for disaster.

During market disturbances, market participants should pay special attention to guidance communicated by industry groups, who may provide special recommendations in times of market stress to aid the flow of information on special issues that may arise.

Conclusion

This paper has reviewed the entire foreign exchange process flow and best practices for maintaining a properly controlled environment. However, as noted in the introduction, several trends in the industry will affect an FX Dealer's ability to implement the best practices as listed in this document. Although the market will continue to evolve and develop mitigating controls, and any set of recommendations will eventually require revision, management should consider

the practices suggested here as helpful responses to recent developments in technology, instruments, and innovations in the marketplace.

The first step toward a properly controlled environment is an appropriate segregation of duties between sales and trading, and operations. However, such segregation of duties does not imply that operations should be viewed as separate from other business lines. On the contrary, the authors of this paper feel that the closer operations management is to the pulse of business, and the better the communication between sales and trading management and operations management, the more responsive operations can be to changes in the business environment. Ultimately, better links between an institution's divisions will enable business as a whole to be better controlled.

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Best Practices Map to 1996 Version and Checklist

2013 Version	2003 Version	1996 Version
Pre-Trade Preparation and Documentation *Process Description*		
BP no. 1: Know Your Customer	BP no. 1: Know Your Customer	
BP no. 2: Determine Documentation Requirements	BP no. 2: Determine Documentation Requirements	BP no. 4: Trading and Operational Practices Should be Agreed Upon
BP no. 3: Use Master Netting Agreements with Credit Support Annexes Attached	BP no. 3: Use Master Netting Agreements	BP no. 19: Master Netting Agreements
BP no. 4: Agree upon Trading and Operational Practices	BP no. 4: Agree upon Trading and Operational Practices	
BP no. 5: Agree upon and Document Special Arrangements	BP no. 5: Agree upon and Document Special Arrangements	
Trade Capture		
BP no. 6: Enter Trades in a Timely Manner	BP no. 6: Enter Trades in a Timely Manner	BP no. 1: Timely Trade Entry
BP no. 7: Use Straight-Through Processing	BP no. 7: Use Straight-Through Processing	BP no. 2: Straight-Through Processing of Transactions
BP no. 8: Use Real-Time Credit Monitoring	BP no. 8: Use Real-Time Credit Monitoring	BP no. 3: Credit Information Available Online
BP no. 9: Use Standing Settlement	BP no. 9: Use Standing Settlement	BP no. 5: All Market Participants Should Instructions Use SSIs
BP no. 10: Operations Should Be Responsible for Settlement Instructions	BP no. 10: Operations Should Be Responsible for Settlement Instructions	BP no. 6: Operations Responsibility for Settlement Instructions
BP no. 11: Review Amendments	BP no. 11: Review Amendments	BP no. 8: Review of Amendments
BP no. 12: Closely Monitor Off-Market and Deep-in-the-Money Option Transactions	BP no. 12: Closely Monitor Off-Market and Deep-in-the-Money Option Transactions	BP no. 7: Review of Third-Party Payments
Confirmation		
BP no. 13: Confirm and Affirm Trades in a Timely Manner	BP no. 13: Confirm and Affirm Trades in a Timely Manner	BP no. 9: Timely Confirmation/Affirmation BP no. 14: Timely Resolution of Confirmation Exceptions
BP no. 14: Establish a Framework for Managing Affirmations and Confirmations via Non-Secure Means	BP no. 14: Be Diligent When Confirming by Nonsecure Means	
BP no. 15: Be Diligent When Confirming Structured or Nonstandard Trades	BP no. 15: Be Diligent When Confirming Structured or Nonstandard Trades	
	BP no. 16: Be Diligent When Confirming by Telephone	
BP no. 16: Institute Controls for Trades Transacted through Electronic Trading Platforms	BP no. 17: Institute Controls for Trades Transacted through Electronic Trading Platforms	
BP no. 17: Verify Expected Settlement Instructions	BP no. 18: Verify Expected Settlement Instructions	BP no. 10: Expected Settlement Instructions
BP no. 18: Confirm All Netted Transactions	BP no. 19: Confirm All Netted Transactions	BP no. 11: Confirm All Netted Transactions

BP no. 19: Confirm All Affiliate Transactions	BP no. 20: Confirm All Internal	BP no. 13: Confirm All Internal Transactions
BP no. 20: Confirm All Block Trades and Split Allocations	BP no. 21: Confirm All Block Trades and Split Allocations	BP no. 12: Confirm All Split Trades
BP no. 21: Review Third-Party Advices	BP no. 22: Review Third-Party Advices	BP no. 16: Review of Reuters Logs and Brokers' Advices
BP no. 22: Automate the Confirmation Matching Process	BP no. 23: Automate the Confirmation Matching Process	BP no. 18: Automation of the Confirmation Matching Process
BP no. 23: Establish Exception Processing and Escalation Procedures	BP no. 24: Establish Exception Processing and Escalation Procedures	BP no. 17: Escalation Procedures/Non-confirming Counterparties
Settlement and Settlement Netting Netting		
BP no. 24: Understand the Settlement Process and Settlement Exposure and Use Settlement Services Wherever Possible to Reduce Settlement Risk within the Market	BP no. 34: Understand the Settlement Process and Settlement Exposure	BP no. 29: Knowledge of the Settlement Process and Settlement Exposure
BP no. 25: Use Real-Time Nostro Balance Projections	BP no. 29: Use Real-Time Nostro Balance Projections	BP no. 24: Online Real-Time Nostro Balance Projections
BP no. 26: Use Electronic Messages for Expected Receipts	BP no. 30: Use Electronic Messages for Expected Receipts	BP no. 25: Electronic Messages for Expected Receipts
BP no. 27: Use Automated Cancellation and Amendment Facilities	BP no. 31: Use Automated Cancellation and Amendment Facilities	BP no. 26: Automated Cancellation and Amendment Facilities
BP no. 28: Implement Timely Payment Cutoffs	BP no. 32: Implement Timely Payment Cutoffs	BP no. 27: Timely Payment Cutoffs
BP no. 29: Report Payment Failures to Credit Officers	BP no. 33: Report Payment Failures to Credit Officers	BP no. 28: Reporting Payment Failures to Credit
BP no. 30: Use Automated Settlement Netting Systems	BP no. 25: Use Online Settlement Netting Systems	BP no. 20: Online Payment Netting Systems
BP no. 31: Affirm Bilateral Net Amounts	BP no. 26: Confirm Bilateral Net Amounts	BP no. 21: Confirmation of Bilateral Net Amounts
BP no. 32: Employ Timely Cutoffs for Settlement Netting	BP no. 27: Employ Timely Cutoffs for Netting	BP no. 22: Timely Cutoffs for Netting
BP no. 33: Establish Consistency between Operational Practices and Documentation	BP no. 28: Establish Consistency between Operational Practices and Documentation	BP no. 23: Consistent Operational and Documentation Policies
BP no. 34: Prepare for Crisis Situations Outside Your Organization	BP no. 35: Prepare for Crisis Situations Outside Your Organization	BP no. 30: Crisis Situations Preparation
Nostro Reconciliation		
BP no. 35: Perform Timely Nostro Account Reconciliation	BP no. 36: Perform Timely Nostro Account Reconciliation	BP no. 31: Timely Nostro Account Reconciliation
BP no. 36: Automate Nostro Reconciliations	BP no. 37: Automate Nostro Reconciliations	BP no. 32: Automated Nostro Reconciliations
BP no. 37: Identify Nonreceipt of Payments	BP no. 38: Identify Nonreceipt of Payments	BP no. 33: Identification of Nonreceipt of Payments
BP no. 38: Establish Operational Standards for Nostro Account Users	BP no. 39: Establish Operational Standards for Nostro Account Users	BP no. 34: Operational Standards for Nostro Account Users
Accounting/Financial Control		
BP no. 39: Conduct Daily General Ledger Reconciliation	BP no. 40: Conduct Daily General Ledger Reconciliation	BP no. 35: Daily General Ledger Reconciliation

BP no. 40: Conduct Daily Position and P&L Reconciliation	BP no. 41: Conduct Daily Position and P&L Reconciliation	BP no. 36: Daily Position and P&L Reconciliation
BP no. 41: Conduct Daily Position Valuation	BP no. 42: Conduct Daily Position Valuation	BP no. 37: Daily Position Valuation
BP no. 42: Review Trade Prices for Off-Market Rates	BP no. 43: Review Trade Prices for Off-Market Rates	BP no. 38: Review Trade Prices for Off-Market Rates
BP no. 43: Use Straight-Through Processing of Rates and Prices	BP no. 44: Use Straight-Through Processing of Rates and Prices	BP no. 39: Straight-Through Processing of Rates and Prices
Unique Features of Foreign Exchange Options and Non-Deliverable Forwards		
BP no. 44: Establish Clear Policies and Procedures for the Exercise of Options	BP no. 45: Establish Clear Policies and Procedures for the Exercise of Options	
BP no. 45: Front Office and Operations Staff Should Work Together to Support Effective Notification of Barrier Life Cycle Events	BP no. 46: Obtain Appropriate Fixings for Nonstandard Transactions	
BP no. 46: Obtain Appropriate Fixings for Nonstandard Transactions	BP no. 46: Obtain Appropriate Fixings for Nonstandard Transactions	
BP no. 47: Closely Monitor Option Settlements	BP no. 47: Closely Monitor Option Settlements	
General Best Practices		
BP no. 48: Ensure Segregation of Duties	BP no. 48: Ensure Segregation of Duties	BP no. 40: Segregation of Duties
BP no. 49: Ensure That Staff Understand Business and Operational Roles	BP no. 49: Ensure That Staff Understand Business and Operational Roles	
BP no. 50: Understand Operational Risks	BP no. 50: Understand Operational Risks	BP no. 41: Understanding Business and Operational Roles BP no. 42: Understand Operational Risks
BP no. 51: Institute a Robust Framework for Monitoring and Managing Capacity in both Normal and Peak Conditions		
BP no. 52: Identify Procedures for Introducing New Products, New Customer Types, or New Trading Strategies	BP no. 51: Identify Procedures for Introducing New Products, New Customer Types, or New Trading Strategies	BP no. 43: Procedures for Introducing New Products
BP no. 53: Ensure Proper Model Sign-off and Implementation	BP no. 52: Ensure Proper Model Sign-off and Implementation	BP no. 44: Model Sign-off/Implementation
BP no. 54: Control System Access	BP no. 53: Control System Access	BP no. 45: System Access Control
BP no. 55: Establish Strong Independent Audit/Risk Control Groups	BP no. 54: Establish Strong Independent Audit/Risk Control Groups	BP no. 48: Strong Independent Audit Group
BP no. 56: Use Internal and External Operational Performance Measures	BP no. 55: Use Internal and External Operational Performance Measures	
BP no. 57: Ensure That Service Outsourcing Conforms to Industry Standards and Best Practices	BP no. 56: Ensure That Service Outsourcing Conforms to Industry Standards and Best Practices	

BP no. 58: Implement Globally Consistent Processing Standards	BP no. 57: Implement Globally Consistent Processing Standards	
BP no. 59: Maintain Records of Deal Execution and Confirmations and Maintain Procedures for Retaining Transaction Records	BP no. 58: Maintain Records of Deal Execution and Confirmation BP no. 59: Maintain Procedures for Retaining Transaction Records	BP no. 47: Taped Conversations between Counterparties
BP no. 60: Develop and Test Contingency Plans	BP no. 60: Develop and Test Contingency Plans	BP no. 50: Contingency Plans

Appendix A: Option Confirmations Messaging Requirement Matrix

The table below sets out product types i.e. fx, non deliverable forwards, vanilla, non deliverable and simple exotic options and the fields that should be completed for foreign exchange matching purposes. For information, the relevant SWIFT message types are also identified (e.g. MT300, MT305 and MT306) as related to each product type.

Key

NDF-non deliverable forward transaction
Vanilla--vanilla option transaction
NDO-non deliverable option
Simple Exotic--the below products are classed as simple exotic:

Single Knock in/Out. Double Knock In/Out
Single Knock in/Out with single window.
Double Knock In/Out with single window.
One Touch Binary, Double Touch Binary
No Touch Binary, Doubler No Touch Binary

A tick denotes field population required	✓
A cross denotes field population not required	×

	PRODUCT					
	FX	NDF	VANILLA	NDO	Simple Exotic	
	SWIFT MESSAGE TYPE					
FIELDS	MT300		MT305		MT306	Key matching field
Type of Operation	✓	✓	×	×	✓	✓
Further Identification (buy or sell, put or call, American or European, currency)	×	×	✓	✓	×	✓
Buy (Sell) Indicator	×	×	×	×	✓	✓
Option Style	×	×	×	×	✓	✓
Expiration Style	×	×	×	×	✓	✓
Barrier Indicator/Flag	×	×	×	×	✓	✓
Non-Deliverable Indicator	×	×	×	×	✓	✓
Type of Event	×	×	×	×	✓	✓
Party A	✓	✓	✓	✓	✓	✓
Party B	✓	✓	✓	✓	✓	✓
Settlement Type	×	×	✓	✓	✓	✓
Fund or Beneficiary Customer	✓	✓	✓	✓	✓	✓
Fixing date field	×	✓	×	×	×	✓
Barrier Direction	×	×	×	×	✓	✓
ISDA Reference	×	×	×	×	✓	
Trade Date	✓	✓	✓	✓	✓	□
Value Date	✓	✓	×	×	×	✓
Final Settlement Date	×	×	✓	✓	✓	✓
Expiry Details	×	×	✓	✓	×	✓
Expiration Date	×	×	×	×	✓	✓
Expiration Location and Time	×	×	×	×	✓	✓
Exchange Rate/Strike Price	✓	✓	✓	✓	✓	✓
Currency, Amount Bought	✓	✓	×	×	×	✓
Underlying Currency and Amount	×	×	✓	✓	×	✓
Put Currency and Amount	×	×	×	×	✓	✓
Receiving Agent	✓	✓	×	×	✓	□
Currency, Amount Sold	✓	✓	×	×	×	✓
Counter Currency and Amount	×	×	✓	✓	×	✓
Call Currency and Amount	×	×	×	×	✓	✓
Premium Price	×	×	✓	✓	×	✓
Premium Currency and Amount	×	×	×	×	✓	✓
Premium Payment	×	×	✓	✓	×	✓
Premium Payment Date	×	×	×	×	✓	✓
Account with Institution	×	×	✓	✓	×	
Settlement Period after Hit	×	×	×	×	✓	✓
Barrier Determination Agent	×	×	×	×	✓	✓

Currency, Amount	×	×	×	×	✓	✓
Type of Barrier	×	×	×	×	✓	✓
Barrier Level	×	×	×	×	✓	✓
Lower Barrier Level	×	×	×	×	✓	✓
Barrier Window Start Date and End Date	×	×	×	×	✓	✓
Location and Time for Start Date	×	×	×	×	✓	✓
Location and Time for End Date	×	×	×	×	✓	✓
Type of Trigger	×	×	×	×	✓	✓
Trigger Level	×	×	×	×	✓	✓
Lower Trigger Level	×	×	×	×	✓	✓
Currency Pair	×	×	×	×	✓	✓