A Case Study Report

Dresdner Bank
Advice you can bank on

Dresdner Bank AG

Market Data Management

AssetControl™ Complete the link in your data infrastructure.

Contents

Introduction

In 2001, the Dresdner Bank Group Corporate Center for Risk Control identified two significant business opportunities: (1) to drive capital savings by expanding coverage of the firm's Value-at-Risk (VaR) model and (2) to strengthen risk control processes overall through the delivery of higher-frequency data to users.

The existing market data management environment could not support these types of advances. To achieve these goals, the bank required a more flexible and scalable market data management environment than was currently in use.

The implementation of a centralized data management system based on integrated, high-performance, reliable software from Asset Control has helped it meet these immediate needs, while establishing a technology platform that could enable enterprise-wide consolidation of market data for delivery of comprehensive, accurate and consistent "golden copy" data set to all corners of the firm.

This case study highlights the opportunities that required the implementation of an advanced market data management environment, the firm's evaluation of possible solutions, and its development and deployment of a new solution based on proven technology from Asset Control International.

The Asset Control implementation by Dresdner became the data management core of a market risk management program that the bank ultimately provided as a service to other financial institutions. Since this case study was written, the operation was sold to IBM in 2004, with Dresdner as IBM's first customer. As this case study is finalized, IBM is negotiating to provide the risk management service to a number of financial firms.

Dresdner Bank AG Business Background

With approximately 1,100 branch offices and more than 47,000 employees, the Dresdner Bank Group is active in over 60 different countries and is one of the leading banking groups in Europe. It is part of the Allianz Group, serving as the organization's center of competence for banking. Services are delivered through the group's domestic and international branches as well as its subsidiaries, all of which are controlled and managed by Dresdner's head office in Frankfurt, Germany.

The Dresdner Bank Group places sizeable effort on the supply of reference market data for risk control processes. Corporate goals emphasize the delivery of superior risk measurement methodologies and technology to drive superior use of capital and, by extension, superior profitability.

The firm's Corporate Center for Risk Control, which maintains a reputation of efficiency and innovation in effectively managing the institution's risk, is responsible for the definition of methodologies and business specifications as well as the design and administration of the supporting technology infrastructure. Using this integrated approach, staff can process new requirements and change requests rapidly and data users have a single point of contact for submitting data requests.

The Risk Methodology Trading group, which is a division of the Corporate Center for Risk Control and is the focus of this case study, provides risk management advice for the organization's trading and investment-related services delivered through Dresdner Bank subsidiary Dresdner Kleinwort Wasserstein (DrKW). With significant operations in London, Frankfurt, New York and Tokyo and an international network of offices, DrKW offers a range of capital markets and corporate finance related products and services to corporate, institutional and government clients in Europe and Worldwide.

Opportunity: Reduce Capital Savings

To meet regulatory requirements, German banks can choose to calculate market risk capital using one of two methods. The first method is a standard approach, in which firms essentially hold a defined fraction of the total business volume. The alternate approach allows authorized firms to calculate risk based on an internally developed VaR model.

Dresdner Bank AG was among the first banks in Germany to receive approval to use an internal VaR model and the organization's early VaR model covered the general risk of equities, the specific risk of equities, FX risk, commodities risk and general interest rate risk.

As the Risk Methodology Trading group reviewed this process, executives recognized that by expanding its VaR model to include the specific risk of interest rate instruments, the firm could more closely estimate its true risk and eliminate the need to hold capital reserves unnecessarily.

The group also saw an opportunity to advance the firm's performance by providing data users with access to higher-frequency data drawn earlier from multiple markets around the globe. By doing so, staff could improve the quality of data used in risk calculations, and thus strengthen the accuracy of risk estimates, as well as offer controllers additional valuation data for more sophisticated price verifications of investment products.

Challenges Presented by Previous Data Management Environment

The challenge, staff realized, was that its existing market data management environment, which was built internally, could not support the substantial increase in the number of data sets needed to expand its VaR model.

Market data from Reuters, Bloomberg, small data providers and in-house sources was fed into a Sybase relational database that ran on a Sun Enterprise 3500 server. Derived market data, such as interest rate curves, volatility surfaces and forward curves, were calculated by the company's proprietary calculation engine, called FinLib (Financial Library), and also fed into the relational database.

The market data management system required significant expansion if it were to support these new risk control functions for the firm.

Additionally, because the system was strictly snapshot-oriented, staff found that it could take several hours to collect instrument data, negatively affecting data quality and making it onerous for controllers to gather accurate valuation data for independent price verification or for actual direct valuation of financial instruments.

The group needed a flexible and extensible solution that would enable it to support a growing amount of data and to integrate real-time market data and static data from different sources with complex analytics in a single, high-performance repository.

To meet its goals, the Risk Methodology Trading group identified three options:

- Launch a significant expansion to its existing system.
- Develop a new system internally.
- Implement a commercial solution.

The cost of extending the performance of its current environment or internally developing a new market data management environment was a significant concern for the firm. An additional factor was that operational

costs from in-house development efforts had proven high in the past due to the number of people required to manage and maintain the systems. Because the existing system was several years old, the group also was concerned that any expansion effort could have a drastic effect on performance and extend processing time frames to unacceptable levels.

As a result, the team quickly determined that implementing a commercial solution would be the most cost-effective option and would provide the organization with the scalability and expandability it needed well into the future.

Criteria for the New Market Data Management Solution

With the aim of expanding the capabilities of its existing market data management environment to better support risk determination, Dresdner Bank hired IBM Business Consulting Services to assist in evaluation of business and user needs in the application of market data for effective service delivery.

Users were surveyed on several factors including types of data accessed, how they wanted to access that data, and their expectations in terms of data quality, synchronicity and availability. Based on the results of this survey, the organization set forth the following business criteria for any new systems:

- Capacity to expand the system in both data volume (including independent price verification data, high-frequency datal and intra-day data) and number of users as business requirements changed.
- Ability to advance performance through use of higher-frequency data drawn earlier from multiple markets around the globe.
- Ability to consolidate, integrate and cleanse data from numerous data sources and data models, including vendor data feeds from Reuters, Bloomberg, niche data and data generated by proprietary calculation engines.
- Flexibility to deliver data to users in various forms to meet current and evolving data user requirements.
- Given that time-to-market, cost and performance were top issues in the deployment of any system, the Risk Methodology Trading group also identified several technical requirements including:
- Ease of implementing data feeds for Reuters and Bloomberg.
- Ability to quickly create interfaces to connect user applications (SQL, ODBC), standard interfaces (SAS, Matlab, Java Enterprise technologies), Internet and middleware.
- Ability to support load balancing and data capture and delivery to meet performance and processing requirements.
- Rapid time to production for implementation of the new database, interfaces and releases.
- Acceptable cost of implementation and maintenance including new hardware, software licenses and operating systems.
- Ease of data model implementations including predefinition, openness, transparency and business view.

Evaluation and Selection of Technology Suppliers

Potential suppliers of market data management solutions were evaluated by the project team on the following criteria:

- ***Vendor Stability and Support:*** Staff looked to limit project risk by selecting an established vendor that would be committed to the group's success and have proven expertise in solving similar challenges.

- With this in mind, the group ranked companies on industry standing and input from reference banks. Additionally, staff reviewed the quality of support based on each vendor's documentation, help desk and on-site support services, skill set of support staff, and delivery of new releases.
- ***Cost:*** The firm compared potential solutions based on total implementation cost, including the cost of new hardware, software licenses and operating system upgrades. Ongoing maintenance costs were also an important consideration given the substantial resources needed to maintain its previous system.
- ***Technical Platform:*** The organization assessed both the cost of implementation and the operational capabilities of competing products. From an implementation perspective, staff focused on the ease of migration from the firm's existing market data management environment to a new environment, the time required to implement the new database, interfaces and releases, and the ease of integrating the firm's existing data model into the new environment.

To help reduce time-to-market when delivering new data sources to users, staff needed the ability to rapidly implement Reuters and Bloomberg data feeds and quickly create interfaces to connect user applications, standard interfaces, Internet and middleware. From an operational perspective, the firm needed to ensure that the new market data management platform could provide superior load balancing and data capture to meet its performance and processing requirements.

System maintenance features for fault tolerance and system stability were also assessed along with each solution's delivery of tools for administration, quality management, GUI development and formula engine, analysis, module integration and auditability.

The Selection of Asset Control

After a rigorous five-month evaluation process of several solutions, Dresdner Bank selected AC Plus from Asset Control International B.V. for the firm's central market data repository. With AC Plus, staff could enhance the breadth, depth and quality of market data to reduce costs, strengthen risk control processes and quickly respond to evolving business needs.

AC Plus provides a mature, reliable and secure centralized in-house data management platform that supplies comprehensive, accurate and consistent "golden copy" data and provides a full audit trail of data sources and operations. The solution integrates, cleanses, standardizes and distributes investment data to help eliminate data redundancies and discrepancies, ensuring that critical applications run on consistent information.

AC Plus stores data in integrated relational and time-series repositories, processes enhancements and analytics, and distributes it to applications and users. The AC Plus relational database system (either Oracle or Sybase) stores all static, references and meta-data, along with status codes used for business workflow and data validation.

The Asset Control time-series database management system, an Asset Control innovation, manages low- and high-frequency data. With high-frequency data arriving every millisecond, an Asset Control server can handle thousands of updates per second for thousands of instruments. A transaction log stores all changes made in either repository, providing an airtight audit trail.

Dresdner Bank chose AC Plus based on three prominent factors:

1. ***Scalability.*** AC Plus could handle massive data volumes to effectively support the group's new risk control requirements and ultimately help centralize and consolidate market data across the enterprise.

2. ***Flexibility.*** Beyond the platform's ability to create real-time snapshots of complex data sets and handle massive data volume, another deciding factor was Asset Control's capacity to integrate real-time market data and static data from different sources with complex analytics in a single, high-performance repository. By doing so, the firm could provide data users with access to data earlier and enable them to compare and correlate market data in three time zones (U.S., Tokyo, Europe).
3. ***Cost of operation.*** During its evaluation, the Risk Methodology Trading group estimated that the firm could save EUR 1.5 million per year over a six-year period using AC Plus in place of its existing solution. These cost savings would come from operational improvements, such as reduced administration and maintenance.

Business Justification for the New Market Data Management Solution

Following its analysis of competing solutions, the Risk Trading Methodology group presented its selection to the Dresdner Bank Board of Directors for approval.

In making its case, the team highlighted the capital and operational savings that AC Plus could deliver. The new infrastructure was a necessary component in enabling the organization to implement a credit-spread value-at-risk (VaR) model and more accurately calculate VaR for interest bearing assets, which would result in significant capital savings. At the same time, staff demonstrated almost EUR 9 million in savings over a six-year period through reduced administration and maintenance.

The Dresdner Bank Board of Directors approved the purchase and in July 2001 the organization began deployment of AC Plus.

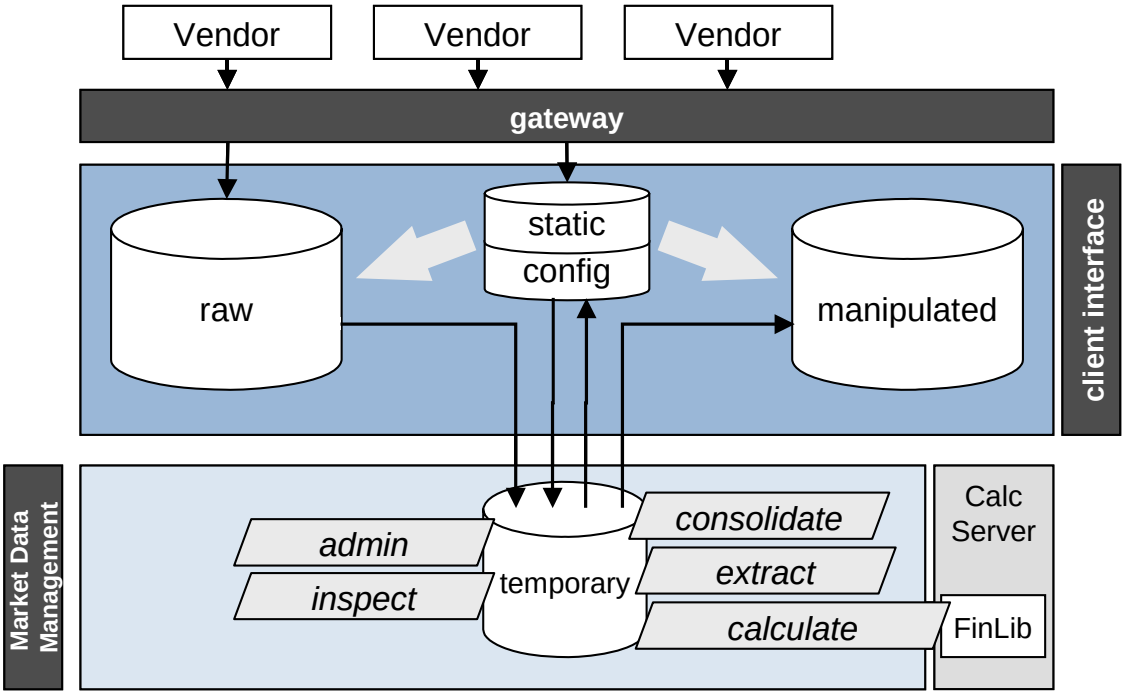
The Asset Control Solution in Action at Dresdner Bank

Since implementation, the firm has met its two main goals: obtain significant capital savings through a more expansive VaR model and support more accurate and sophisticated risk control processes through delivery of real-time high-frequency data.

Additionally, the flexibility and scalability of AC Plus has enabled staff to quickly respond to new opportunities. For example, Asset Control proved to be a critical tool in helping the bank restructure its credit process for large corporate customers and provide staff with the necessary data to create a fair valuation of the credit engagement that the bank was about to undertake. Likewise, it has enabled staff to begin consolidation of disparate data silos located across the firm to improve data consistency and accuracy and help drive additional operational savings.

With Asset Control platform, market data from Bloomberg, Reuters and other niche vendors is consolidated, cleansed and normalized for use in valuations. The feeds include both tick-by-tick data and snapshot data. Additionally, the Asset Control time-series database management system provides users with access to low- and high-frequency data. In all, the system supports almost 86,000 time-series (stored for three months) with an average of 300 new ticks per day; 50,000 to 200,000 snapshots (one per day for each time zone); 5,000 yield curves; and 500 to 4,000 volatility surfaces.

Asset Control's open, standards-based platform enables the bank to extract static data and process in FinLib and then feed it back to Asset Control for storage and distribution to data users. Asset Control filters the data automatically to eliminate unnecessary values, such as incomplete data sets and zero values, for improved quality and consistency.



Asset Control software supports a multi-stage quality management process (Image source: Dresdner Bank)

Implementation of the Asset Control Solution for Market Data Management

The implementation of the Asset Control solution was undertaken in stepped phases with the goal of providing the end users as seamless a transition as possible.

Phase 1

During phase one, which was launched in July 2001 and completed in February 2002, the team's goal was to create a shadow system that provided the same market data management capabilities as the previous environment. The existing system remained in operation and a pilot team of data users tested the new system for performance, quality and ease-of-use.

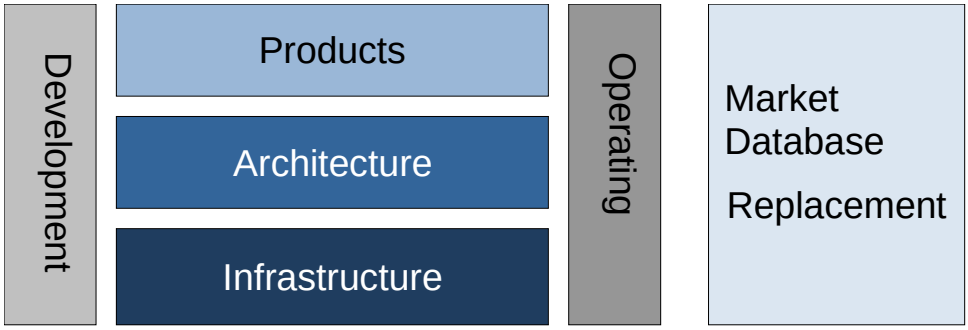
The implementation included the deployment of a new hardware platform, based on two Sun Fire 6800 servers, each with eight CPUs [check] reserved for the Asset Control solution. The systems run Sun Solaris and use Sybase ASE (Adaptive Server Enterprise) for the AC Plus data management platform. Drive space is mirrored online between two separate locations for a smooth fail-over procedure.

The extensive AC Plus API (application programming interfaces) library and API development tool enabled staff to assemble the interfaces to import and export data from multiple systems, including FinLib and internally developed user applications, to the Asset Control data management platform.

In Phase 1, IBM Business Consulting Services contributed the methodology for the establishment of the IT infrastructure as well as the build-up of the development and test environments. The development of a meta-data model as well as the logical and physical data architecture followed. The next steps included the design

of the processes, the roll concept, and the professional concept. The final steps of Phase 1 included the implementation of new functionalities (FX, CPI) and the allocation of a production pilot.

The development of the introduction methodology was central to Phase 1:



Methodology for migration (Image source: IBM BCS)

Phase 2

Based on the positive feedback received following the first phase, the Risk Methodology Trading team then launched Phase 2 of its implementation, with delivery of 25 additional data products and general delivery to more than 400 users.

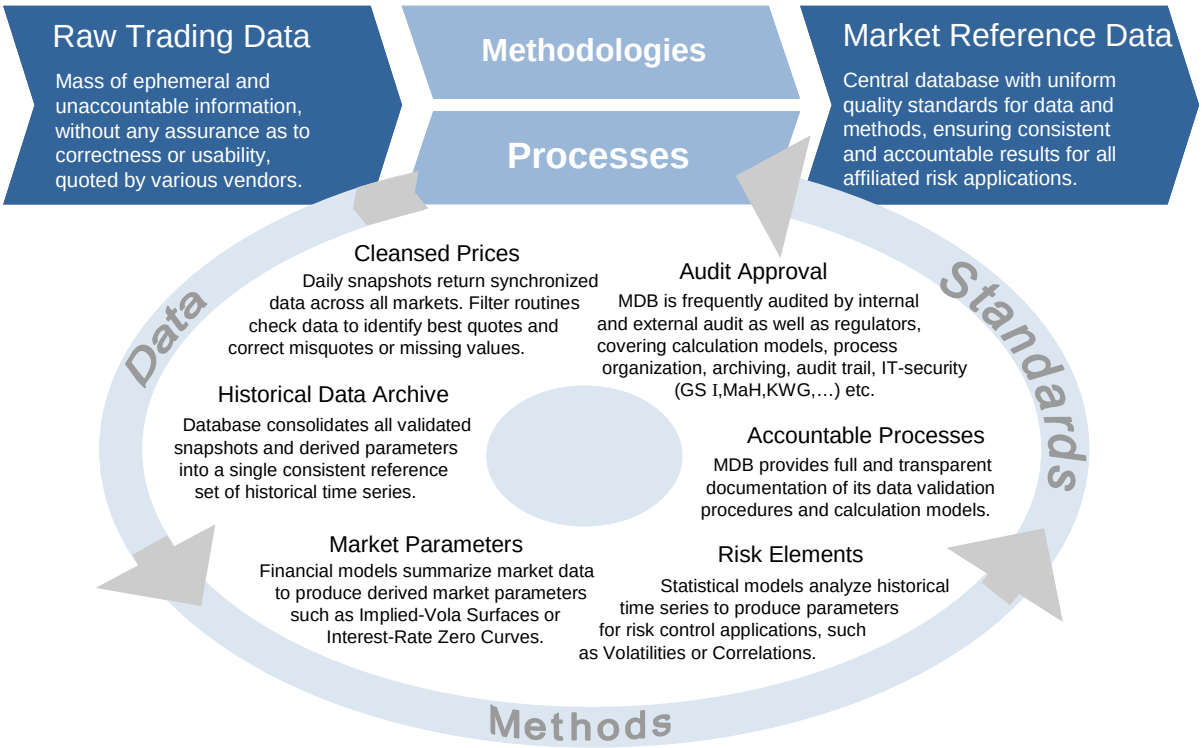
IBM's Business Consulting Services assisted the implementation team in creating the detailed specification and implementation of the technical functionalities of the new database. This process was based on the following methodology:

- Coordination of the technical requirements profile with Dresdner Bank, especially the improvements over the old solution.

- Creation of the technical specifications for relevant financial instruments, as well as appropriation of interfaces, connection of calculations, and migration of data and users. Quality assurance of the technical specifications by an independent unit of the bank
- Development of technical specifications for the business requirements, and implementation of financial instruments on these specifications. These specifications included:
  - Data-models, data management processes and data quality management processes for financial instruments crucial to the management of market risk.
  - Specification of calculations processes (especially various types of interest curves and volatility-surfaces) and quality-assurance processes for the calculated data.
- Concept testing, implementation and then parallel running of the old and new environments, followed by decommissioning of the old environment.

Product implementations were conducted using an iterative approach, with simple products (e.g., FX Spot) implemented first and more complex products (bonds, credit-spread curves, etc.) implemented later in the process. By doing so, staff could refine the implementation process to accelerate implementation time and cut implementation costs in half.

Phase 2 was completed in December 2002 and by March 2003, following user acceptance testing, the previous data management solution was taken offline. Throughout the process, Asset Control professional services staff provided assistance with architecture and project design.



Market Data Base provides high quality data (Image source: Dresdner Bank)

Business Benefits and Future Outlook of the New System

The Asset Control market data management platform was a key factor in the Dresdner Bank initiative to significantly enhance the breadth, timeliness and quality of market data used for risk control functions. This conclusion was supported by an internal audit launched following the implementation of AC Plus.

According to executives, the initiative has enabled the firm to realize significant capital savings and more effectively manage risk. Additionally, as estimated, Asset Control reduced operational costs by EUR 1.5 million in the first year, and staff expect this savings to be repeated annually.

Operational savings were generated from improved staff productivity, and reduced software fees and data management costs. For example, previously, operators were needed to monitor the old system to ensure that data was processed and available on time. This is no longer necessary as Asset Control provides automated recovery options that can restart failed process without operator intervention.

Likewise, the high-performance processing power of the Asset Control solution enables staff to complete data consolidation and processing activities one hour ahead of schedule almost 95 percent of the time and on-schedule the rest of the time. In the past, when performance lagged and processing of data extended past the scheduled time frame, the company needed to pay workers overtime, increasing total operational costs.

Post-Implementation Expansion and Upgrades

Following the initial implementation, the firm's focus has been in three areas. First, staff continue to expand and enhance the market data available to users to support new business opportunities. Recent examples include the delivery of implied inflation curves of indexed government bonds that will help traders of DrKW to market complex interest rate derivatives. In addition, the delivery of intra-day data will help the firm strengthen and refine the market conformity check process.

Secondly, the team has begun use the Asset Control platform to consolidate disparate data repositories that have been created over time and are scattered across various organizations. This is an important effort, executives highlight, as it will help improve data quality and reduce operational costs even further. In fact, the team estimates that this consolidation can save millions of Euros in licensing fees alone.

And finally, the group continues to strengthen data quality by more extensively leveraging the robust data cleansing algorithms built into AC Plus.

Concluding Observations

In 2001, the Risk Methodology Trading group at Dresdner Bank was faced with an urgent need to expand its delivery of market data. Expansion would enable the organization to more accurately calculate risk factors and measure exposure, which, in turn, would lead to substantial capital savings.

Following an extensive evaluation of possible options, the group selected high-performance, reliable market data management software from Asset Control to help enhance the breadth, depth and quality of data across the institution. The Asset Control solution enabled staff to address this immediate opportunity and provided an expandable and flexible foundation so the firm could quickly adapt to evolving business opportunities and regulatory requirements. Additional benefits were obtained in reduced operational overhead, and these benefits are being expanded today through the consolidation of disparate data silos.

The challenges and opportunities that Dresdner Bank Group face are not unique. Across the financial sector, banks are struggling to provide staff with access to accurate, high-quality and consistent data for effective decision making. Asset Control provides a proven, time-tested solution that simplifies and centralizes management of market and reference data to help optimize risk management processes and reduce data management costs.

About Asset Control

Asset Control is the world's leading provider of Centralized Data Management (CDM) to financial industry firms. With a complete range of in-house and outsourced options, Asset Control delivers Total Data Management (TDM), a hybrid approach to data management. The selection of developer tools, turnkey software solutions and outsourced services enable users to optimize their investment data for efficiency, cost control, reduced operational risk, and increased value from their data.

Derived from the robust and reliable AC Plus modular framework, the Asset Control product set includes data solutions addressing market risk, counterparty credit risk, security master, research and corporate actions, as well as global data networking and administration. Handling data from vendors and in-house systems, these solutions collect, validate, normalize, and consolidate data into cleansed composite "golden copy" sets for business use.

Customers include Abbey National, ABN AMRO, Allied Irish Banks PLC, Barclays Capital, Barclays Global Investors, Bayerische Landesbank, BBVA, Calyon, Commerzbank, Convexity Capital Management, E*TRADE Securities, LLC, IBM (Dresdner Bank), Grupo Santander, Harvard Management Company, HSH Nordbank, HypoVereinsbank, ING, Lloyds TSB Corporate Markets, LCH.Clearnet, Robeco Groep, Société Générale, Standard Bank, Standard Chartered, Union Investment and Wachovia Corporation as well as a super-major global energy group. Established in 1991, Asset Control is a privately held firm with operations in London, New York and the Netherlands. For more information please visit www.asset-control.com.

About IBM Business Consulting Services

IBM BCS is the world's largest consulting organization with more than 60,000 professionals in 160 countries. With deep experience and expertise in more than 20 industries, enhanced by $5 invested annually in technology and business research, IBM BCS delivers a broad set of solutions spanning strategic change, customer relationship management, supply chain operations, financial management, human capital, IT and business process outsourcing. Access to the global capabilities of IBM also provides customers with integrated technology services, application management services, strategic outsourcing, learning services and global financing. For more information about the risk management services of IBM BCS, please contact www.ibm.com/bcs.