Applying Standardised, Interoperable and Innovative Automated Solutions: Corporate Treasuries and the Development of Globally Connected Financial Services

By: Tom Buschman, Treasury Development Manager, Shell International and Nikiforos S. Panourgias, Research Officer - Moving Markets Project, Department of Information Systems, London School of Economics

Web: twiststandards.org - is@lse
Email: T. Buschman - N.S. Panourgias

Tom Buschman is development manager for central treasury operations of the Shell Group. Previously he was responsible for Shell's central foreign exchange and money market activities and a number of major projects. He also chaired the Executive Advisory Board of Currenex, the independent financial trading platform in which the Shell Group has made an investment. Before coming to London, he worked for Shell's Dutch Pension Fund and held various finance managerial positions for the Shell Group in Brazil. He is also a Visiting Fellow (Innoviation for Financial Markets) at the London School of Economics and chairman of the TWIST integration standards initiative, a non-profit international industry group focused on achieving effective straight through processing (STP) throughout the purchase and sales processes of commercial and financial transactions. At present this covers standards for the STP of wholesale trade transactions, corporate payments, billing of bank services and working capital management. The core principles of TWIST are to drive process innovation and to be open and inclusive towards all market participants and their service providers. The TWIST approach is characterised by collaboration, which explains its proactive role in developing standards in conjunction with other standards bodies such as ISO/SWIFT, IFX, FpML, RosettaNet, MDDL market data standards and CRG-Edifact. The corporate treasury of Royal Dutch/Shell, now joined by 80 other market participants, has played a leadership role in this initiative.

Niki Panourgias is a Research Officer for the Moving Markets project at the Department of Information Systems at the London School of Economics. The project is studying the strategic use of ICTs in relation to financial markets and their clearing and settlement infrastructures. He is currently in the second year of his PhD on the role of information infrastructures in the design and development of cross-border securities settlement systems in Europe. He holds an MSc (Econ) from the London School of Economics in the Politics and Government of Europe, and has a joint BA (Hons) degree in History and Politics from London University's Queen Mary & Westfield College. He has also worked as a financial and business journalist covering the internet sector as investment editor of UK e-business website Netimperative and before that as editor of the magazine New Media Investor. Prior to journalism he worked as an electronics industry analyst at business and market information publishing house Market Tracking International producing reports on the European electronics and the global semiconductor industries. He also worked on a freelance-basis on a number of reports and consultancy projects for business information publishing and consultancy company Euromonitor.

Abstract

Large multinational corporations operate in a wide variety of countries with a range of risks associated with their size, infrastructures and operational practices. Increasingly ubiquitous and powerful ICTs have enabled the centralisation of many support functions from local operations to the corporate headquarters. This, in turn, has led to a concentration of contracting for financial services with global and strong regional banks, primarily in Western countries by corporate treasuries. In this context, the development and adoption of standardisation in informational linkages can become a crucial component in remote and centralised decision-making by providing a mechanism for re-engaging financial service providers in emerging markets in the execution of financial services with limited intermediation from global or regional banks. Prime broker services, for example, combined with an efficient processing of transactions, can facilitate enhanced international market access for local financial institutions by providing the necessary credit intermediation between multinational corporations and local financial institutions. This paper seeks to show how the corporate treasury of a large multinational corporation, through the use of ICT-enabled transactional process innovations, is developing effective and efficient mechanisms for the management of the credit, concentration, and operational risks involved in contracting with local financial services firms. It also demonstrates how interoperability based on ICT standards is an essential component of such an arrangement if the risks of operating in a volatile and heterogeneous global financial environment are to be mitigated rather than just displaced or obscured. The paper also illustrates how over the past five years, significant progress has been made in constructing the infrastructures and establishing the services that will be needed to enable financial services institutions in emerging markets to benefit from enhanced access to global markets. It further shows how the pro-active engagement of these local financial services firms and their regulators with such arrangements is an indispensable part to any strategy to reversed, or at least mitigate, the current trend of financial services provisions migrating from local institutions to regional and global banks. Such a pro-active engagement should involve a focused seeking-out of new ways to deliver financing, liquidity management, FX and related services to international multinational firms. This, as will be show, entails a high degree of standardisation, automated supporting of transaction services, active contracting with prime broker services and engagement with regulators in order to ensure automation of reporting requirements and rapid authorisation processes for cross-border transactions.

Introduction

For global corporations, emerging economies are increasingly important, both in terms of supply and demand. Opportunities and rewards, however, are often associated with higher volatility, uncertainty, and consequently perceived risk.

The oil industry especially plays a key role in many emerging economies. This is due to the way that extensive extractive operations are often based in developing countries as well as the fact that energy products are a core necessity for every economy. As a result, global corporations in the sector remain intricately embedded in local institutional and technical networks, especially the financial infrastructures. Such corporations often possess significant assets based in emerging economies and have large operational costs to be financed. The interactions between headquarters and local operations of such firms are, therefore, very much dependent on the institutional and ICT linkages in place for their smooth and efficient operation. In this context, such multinational corporations have a vital interest in ensuring that these arrangements are optimum

This paper represents a study of the implementation of an ITC-enabled process modernisation initiative by the Global Treasury Operations of Royal Dutch Shell based on the adoption of standardisation and automation for operational processes in financial services around what is known in the financial services industry as a "prime brokerage model". Through this study an illustration of the importance of interoperability and infrastructure flexibility in developing responses to the demand for globally connected financial service provision is made. In this way, the increased connectivity and interoperability made possible by ICTs can be used to mitigate the liquidity, volatility, and surveillance costs that dealing in both emerging and mature economies entails.

In the article we also discuss the reasons for the growing adoption of the prime brokerage model, with

special attention given to the role of the prime broker as credit risk intermediary, trusted information aggregator and catalyst for standardised and automated interoperable services. The more specific case of foreign exchange prime brokerage (FXPB) usage is examined as a part of the wider operational and risk management strategy of the Shell treasury in relation to foreign exchange and in which centralisation, standardisation, electronic multi-bank trading and the prime brokerage model feature prominently.

Prime brokerage, standardisation and interoperability as enablers of financial trading

Prime brokerage is an intermediary service developed in the financial services industry to facilitate the transacting process in stuations where trading partners would otherwise not transact with one another because of their different levels of creditworthiness and appetite for credit risk.

The spread of prime brokerage is not primarily due to the operational services it provides in settlement, custody, and trade reporting. Rather, it is as a way of facilitating access to financial markets for less creditworthy market participants. Prime brokers allow market participants to execute transactions in their own name or in the name of the prime broker, whilst the settlement of these transactions occurs in the name and under the responsibility of the prime broker. This means that both credit intermediation and anonymous trading are enabled by such services.

The value of prime brokers in credit intermediation and anonymous trading is apparent in the rapid growth of prime brokerage in line with the increasing pervasiveness of hedge funds. As trading entities, hedge funds drive market knowledge and understanding but lack financial standing in their own right. They also tend to be aggressive market participants and this makes them prefer anonymity during the execution of their transactions in order to avoid speculative behaviour by other market participants to their disadvantage.

Unlike other initiatives in the area of financial market trading innovation, prime brokerage represents a rare example of a non-trading innovation relating to back and/or middle office processes (Buthorn 2003). While the spread of prime brokerage services is not primarily due to the operational services provided, it is through these trade-processing services that prime brokers are able to aggregate customers' collateral and, thus, be in a position to provide the credit risk management and asset lending services that are driving the adoption of these services. As such, the prime broker can be viewed as "a credit and accounting consolidation vehicle, managing the customer's settlements, confirmations, statements, credit relationships, record-keeping and other administrative tasks" (Buthorn 2003). As a result, a service until recently described as "a relatively small and misunderstood part of the banking industry", is now increasingly being seen as central to the provision of "technological support, access to markets, synthetic products, and introductions to potential investors" (Jung 2004).

The initiative presented in this paper relates to the implementation of an operational and risk management process for interaction with foreign exchange markets by the treasury of a large corporate entity with many dealings in emerging markets. This strategy is based on the use of online multi-bank trading and the introduction of an electronic foreign exchange prime brokerage (FXPB) model.

In general, multinational corporate clients are now increasingly employing more than one prime brokerage provider. This not only ensures the competitiveness of the service offering in terms of transaction costs and spreads but also the more effective distribution of credit risks and the maximisation of strategic flexibility. It also ensures access to a wider range and variety of assets enabling the construction of more complex dealing strategies. It is as part of these demands from clients of prime brokerage services for greater strategic flexibility and more competition among providers that issues relating to interfacing and interoperability become crucial. Buthorn points to initiatives to standardise documentation among executing banks as enabling participants to "significantly reduce the time required to set up an FXPB relationship, reduce implementation costs, and standardise the legal framework around the product" (Buthorn 2003). As product offerings expand to cover spot and forward foreign exchange, options, structured options, and swaps, so does the complexity and uncertainty of the relationships involved in their provision. The need for greater interoperability and standardisation that will faciliate the assembling of multiple offerings from multiple providers into a 'palate' of instruments to suite the particular needs of a customer without increasing risk is thus also expanded.

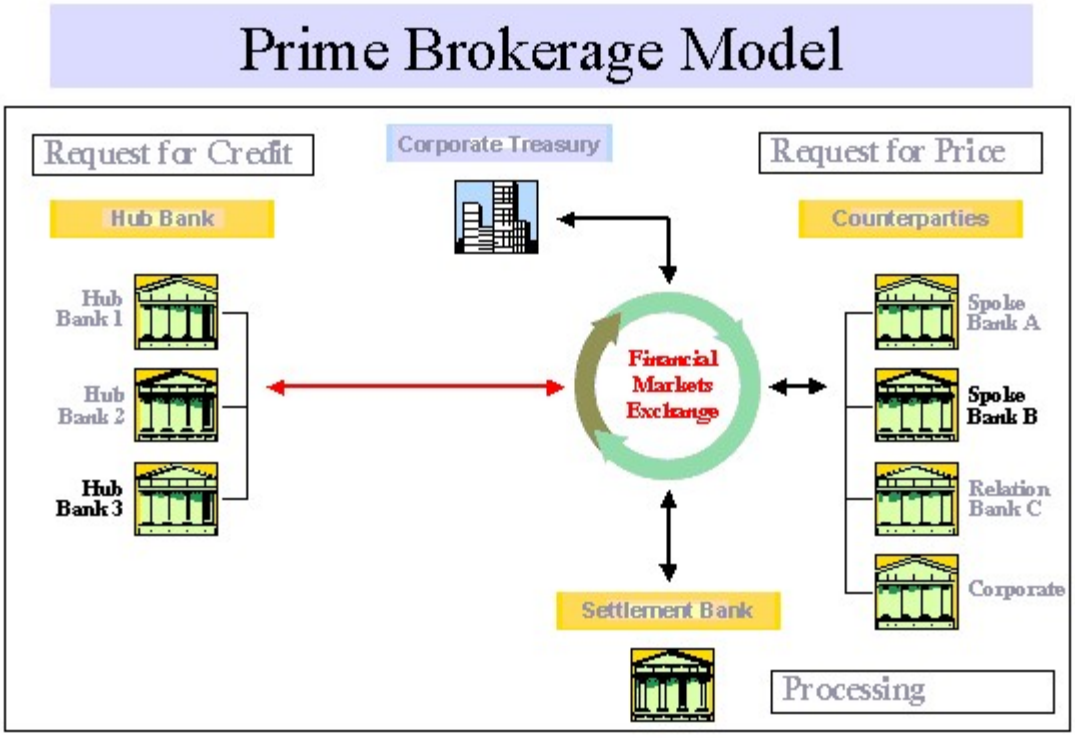

Figure 1: The Prime Brokerage Model

The standardisation of information flows, whether in paper or electronic form, thus allows for high degrees of low-cost automation that can help keep extra technological, informational, institutional, and organisational complexity to a minimum. This is particularly the case as FX portals have become increasingly central to FX trading strategies between the clients and banks involved in wholesale FX markets. Clients require a choice of portals so as to ensure continued growth and development in the service offerings provided by the portals as well as price transparency, adequate liquidity, and Straight-Through Processing (STP) (Buthorn 2003).

STP, in particular, is an area of vital importance in the future development of FXPB and risk management strategies developed around such a model. As Buthorn describes, FXPB transactions have traditionally been processed by "clerks handling thousands of pieces of paper each day", with clients having to be satisfied with "an error-prone, non-transparent process that sometimes took hours or days to resolve the simplest problems" (Buthorn 2003). Developing "the right technology", therefore, is "the only investment by which banks can increase efficiency and reduce costs and errors." (Buthorn 2003). Developing the technologies that will provide interoperability, ease of use, and a cost-effective way of interfacing among market participants is, therefore, absolutely necessary in order to deliver the full benefits of FXPB to all stakeholders.

Although ICTs, standardisation, and interoperability might hold many of the answers to the issues outlined above, moving to practical initiatives to achieve these objectives is a not a simple matter of technological design. It is a matter of developing a shared understanding of the processes that will be standardised in the electronic and/or paper documentation and messages exchanged among the market participants and such a mutual understanding can only come through careful negotiations and compromises.

While such negotiations can be fraught and often protracted, the resulting interoperability is not, however, only of value in terms of improving efficiency and levels of competition for customers. It also ensures easy access to many more potential clients for any provider that adheres to the rules of standardisation and interoperability and can build transactional relations with global and leading regional financial intermediaries and informational and service offering links with global end users. Given that web-based technologies now ensure low cost worldwide connectivity, the trend towards standardisation and interoperability provides significant opportunities for market penetration by any provider that can gain access and offer required services at relatively low cost. Such a profile fits many banks in emerging economies with natural sources of local liquidity and specialised knowledge of local markets.

Centralised treasuries of multinational corporations and their access to local banks

A process of centralisation of activities within global corporations is being driven by a need to increase efficiency and improve operational control over worldwide activities as opportunities provided by the development of global Internet-enabled financial infrastructures and service outsourcing have grown. In particular, the centralised co-ordination of a company's fiscal structures and its financial assets and liabilities could easily be obtained without significant upfront and maintenance costs. As a result, corporate treasuries located at head-offices are increasingly taking control of te financial structuring of local operations. This tends to be combined with a concentration in dealing for most financial services with banks that have a strong relationship with the central corporate treasuries. As a consequence, financial institutions, particularly in emerging economies characterised by a limited number and size of global corporations, are loosing business to global and strong regional banks that are well connected to Western financial infrastructures and typically enjoy direct access to the global corporations. Despite this, the overall underlying demand for the services that are ultimately provided by local financial institutions in emerging economies has not decreased. The only real change has been in routes of access to these services, which are now increasingly via global and strong regional bank intermediaries.

With regards to FX transactions, global and regional banks either have to take a position on a certain currency and hence take this currency in stock, or they have to depend on market participants that have an opposite position. In the case of emerging economies, these opposite positions are normally held by other corporations or by banks that have access to local liquidity in the country concerned. These tend to be local banks with a sizeable retail or wholesale customer base.

For advice on local markets, especially in the case of emerging markets, global and regional banks tend to draw heavily on information provided by local financial analysts. In terms of liquidity and knowledge provision, therefore, many global and leading regional banks in fact operate as intermediaries between the local financial institutions in emerging economies and international clients such as multinational corporations.

Another important result of the centralisation of financial exposures in multinational firms has been a reduced appetite for credit risk. Decentralised treasuries in the past had to deal with banks in many countries. These local banks, however, often did not have a high credit standing, especially as the credit rating of the country they operate in acts as a ceiling for the credit rating of the banks that operate there, reflecting the perceived risk associated with operating in that country.

On the other hand, global or regional banks tend to have far better credit ratings, given that they tend to be bigger, with a wider portfolio of assets, and tend to be located in countries that possess significantly higher credit ratings. These credit ratings are primary selection criteria on the side of corporate treasuries of multinational firms in terms of selecting the banks they will operate with. In practice, sound risk management practices result in a selection of banks with a relatively high credit rating being used. This practice can be explained by the abundance of banks with high credit rating in Western countries and the need to manage the risks that the concentration of exposures in centralised treasuries has produced, with ever larger amounts of assets needing to be managed carefully. The result has been that the shifting of activity towards global and regional banks and away from the local banks by multinational corporations has come to be seen as irreversible. This is especially so when there is no obvious, efficient, and non-mediated way for multinationals to access the services of these local banks while the credit hurdle remains as an obstacle.

As noted above, the Prime Broker Model separates the price negotiation and transaction execution elements of a trade from the counterparty credit risk in a standardised and interoperable manner. The model, therefore, enables small and medium size financial service providers who are not necessarily able to provide the credit risk profile that a credit risk conscious counterparty may demand to interact and transact with this counterparty via the intermediation of the prime broker, typically for a fixed fee that covers the credit risk and operaional processing costs. Therefore, while the prime brokers may be concentrating large-scale client deal flow in their hands, their intermediation is based solely on the credit buffer they provide. Even where the larger prime brokers are often global of strong regional banks, their prime brokerage services are kept separate from the bank's own trading activities to ensure confidentiality around the transactions that are brokered. This makes possible a direct relationship between financial service providers in emerging markets and large global corporations through a prime

broker, without the complete intermediation of regional or global banks in the transaction execution found in a non-brokered arrangement. By providing accessible, standardised, interoperable, and good quality services that are easy to interface with a range of prime brokers, local financial service providers can become attractive for global corporations that do business in emerging markets where the local providers are likely to be market leaders and know the local culture and marketplace well.

The accessibility of local providers and markets is also affected by the degree to which regulators (i.e. central banks) in emerging economies influence the processing of transactions. In many emerging economies, both international banks and corporations are feared for their potential influence on local market structures, overpowering local market participants, and for their potential influence on exchange rates and interest rates. As a way of protecting themselves, local regulators often impose limits for transactions or set rules for informing the authorities about executed transactions or demand the pre-authorisation by the authorities of proposed transactions. While the accessibility of local banks to international economic actors would be enhanced most by the absence of such measures, the standardisation of informational requirements and exchanges and the, as far as possible, automation of authorisation processes would be an attractive and feasible alternative that would not only lower hurdles for the execution of valid transactions, but would also improve the reporting process and improve the oversight capabilities of the local regulatory bodies.

The Shell Initiative

The case study presented in this article centres around an initiative by the Global Corporate Treasury of Royal Dutch Shell to develop an operational and risk management strategy for its interactions with foreign exchange (FX) markets. At its inception in 2000 the main aim of this strategy was to extract maximum advantage from the ability to trade online with multiple banks through the application of a multi-bank prime brokerage model.

In general, the centralising of operations by corporate treasuries has resulted in an increasing need to deal with growing volumes of financial transactions in order to cover the liquidity requirements of international business operations. As a result, treasuries are now likely to enter into a large number and high aggregate value of FX transactions on a daily basis in order to cover the liquidity requirements of subsidiaries. This constructs an efficient central liquidity pool through the daily transfer of funds between subsidiaries and corporate treasuries and corporate treasuries, thus, also enter into FX transactions to mitigate the impact of FX price volatility, hedging FX exposures.

The desire to increase efficiency and improve access to a plurality of global financial service providers that can support FX transactions has led to a demand by companies such as Shell for electronic execution of FX transactions via multi-bank FX platforms. Furthermore, to facilitate FX transactions for non-mainstream currencies with providers that can offer the necessary liquidity in an efficient manner, a wider spread of provision of prime brokerage services was sought. This is especially important for il companies that, due to the nature of their business, have relatively high exposures to emerging markets.

From the point of view of the Corporate Treasurer in a company such as Shell, there are a number of key features of emerging markets that are relevant to the application of a successful operational and risk management strategy. These features are:

- Market processes in emerging markets are perceived to be similar to those found in more mature economies.
- Prices are more volatile and liquidity is more limited and therefore hedging of FX risks can be costly due to the perceived price risk of the currency concerned.
- Infrastructures in emerging markets are of a higher quality than often assumed but may have specificities uncommon to the Western markets.
- Governments and central banks in emerging markets tend to be seen as having a relatively strong desire to control market activities, which limits the efficiency and general attractiveness of these markets.
- Bureaucratic slowness relating to transaction initiation and execution is often seen as overly burdensome in situations in which rapid responsiveness is required, limiting the ability to transfer sums of funds in and out of the country.

In order to operate effectively in such settings while reducing risk and uncertainty, the Shell Treasury's view was that specialist knowledge and flexible solutions were required that would provide access to local banks and financial service providers with all their local experience but in a way that credit, systemic, and operational risks were reduced to a minimum.

It was of central importance to such a strategy to be able to access the "natural liquidity" of local banks and the informational signals and early warnings that they have access to in their particular local market. The role envisaged for the local banks in such an arrangement was that of trusted and knowledgeable informational partners involved directly in the transactions executed by the centralised corporate treasury. From the corporate treasury perspective, however, the absence of an existing direct relationship with such local banks was an obstacle to building the necessary trust in their ability to provide directly and at a reasonable cost high quality services and the required access to liquidity. This was because such a direct relationship was precluded due to the lower credit standing of these local banks, which, as mentioned earlier, relates to the credit standing of the country concerned. The removal of the credit obstacle coupled with the development of other mechanisms to enable stronger controls on the side of the corporate treasury were seen, therefore, as prerequisites for these new relationship to be feasible. This, in turn, was seen as requiring the application of STP and standardised processes and documentation/messaging in line with the other FX transactions executed by corporate treasuries. It should be bourn in mind that with corporate treasuries generally situated in developed economies characterised by relatively high labour costs, efficiency improvements and limiting operational risks are prominent business drivers, especially given that treasuries tend to be regarded by senior management at firm level as cost centres.

The overall strategy of Shell for its interaction with FX markets was incorporated into two wider initiatives:

- The Optimised Global Treasury (OGT)
- Global Straight Through Processing (GSTP)

The aim of the former was to integrate internal and external trading with the company's global liquidity management operations through cash pooling, centralising control of liquidity management and centralising FX operations. The latter aimed at "connecting processes and aligning the organisation" in order to make "full use of existing infrastructures and opportunities".

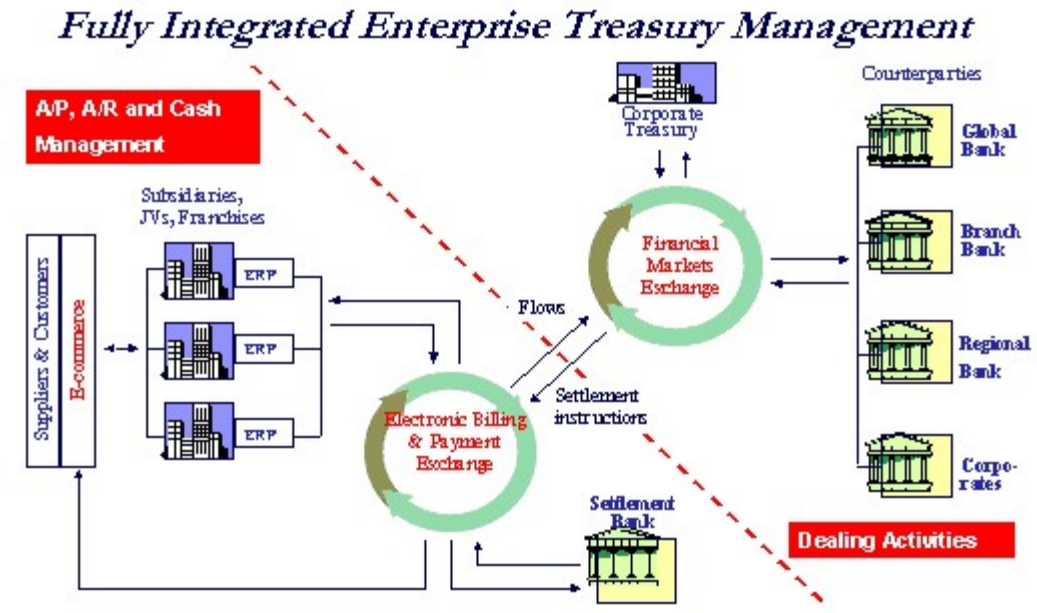

Figure 2: Integrated Treasury Management

The Shell strategy had three main elements with respect to interactions with FX markets:

1. Electronic trading with a variety of banks via an FX portal
2. Unrestricted access to liquidity through prime brokers

3. Interactions and transactions based on standardised but flexible processes

The main perceived benefits of adopting the wider GSTP initiative were to deliver general value chain improvements for financial transactions that affect Shell but in such a way that all participants in the transaction process would share them. Anticipated benefits were related to gains from greater efficiency and reduced risks resulting from:

- Higher transaction speeds
- Limited need for reconciliation
- Reductions in manual interventions
- Enhanced informational content that could facilitate decision making in situations demanding rapid adjustments or provide better opportunity discovery potential

The key components in the implementation of this strategy for FX were:

- An investment in the online multi-bank FX exchange Currenex in November 2000, seen as a way of improving dealing and settlement efficiency in the important area of FX trading for a global corporation such as Shell
- Support for, and the nurturing of, the Transaction Workflow Innovation Standards Team (TWIST) initiative.

A central aim of TWIST was to promote interoperability through the design, development, and diffusion of best practices, processes, and standardised electronic messages for the end-to-end processing of transactions throughout the value chains associated with large corporate treasuries.

TWIST and its aims were seen as essential because interoperability was considered a crucial feature in ensuring that through the market structures established interactions could take place with multiple banks, service providers, clients, systems, and countries. Interactions should not only take place through a multiplicity of links, but also relate to a wide range of products and services covering the entire spectrum of corporate treasury activities (see Fig. 3).

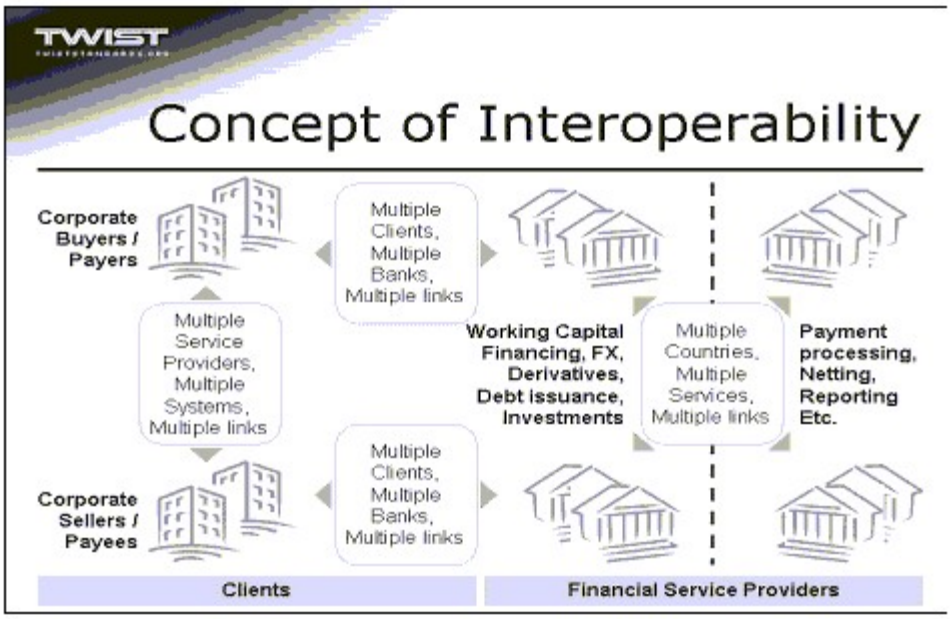

Figure 3: Presentation slide illustrating the concept of interoperability

A third component of the strategy was encapsulated in the phrase "flexible market access with limited effort", aimed at using a multi-bank prime brokerage model to achieve:

- Access to liquidity providers in all currencies
- Access to liquidity providers for large transactions
- Full access to low liquidity markets
- Flexible use of multiple trade execution methods (requests for quotes, executable streaming prices and individual and open orders)

- Enabling of anonymous trading, using the name of hub banks in the prime brokerage model

In order to be able to achieve these objectives a number of practical requirements had to be fulfilled. These were:

- Electronic trade execution with multiple trade execution methods, to be realised via the online multi-bank FX exchange
- Credit arrangements in place between hub and spoke banks in the prime brokerage model
- Standardised credit service agreements between hub banks and customers
- Request for credit functionality on online trading platforms with multiple prime brokers
- Unified charging model for credit service hub banks
- Reduced credit risks and consequential costs for prime brokers by usage of CLS (Continued Linked Settlement system for FX)
- Standardisation of informational requirements by and at least semi-automation of pre-authorisation procedures with local authorities in emerging economies

Theoretical Perspectives

As can be seen from the reasoning behind the FX trading strategy of the Shell Treasury, participants in the global fnancial system want to enjoy global reach and scope in terms of opportunities and the network effects and other benefits of scale a large and interdependent global financial system and infrastructure provide. They want to achieve this, however, without the costs of increased risk and uncertainty, loss of control, path dependencies, and lock-ins that can often accompany such moves. The back and middle office innovation of prime brokerage has been suggested as a form of organisational and risk management process that seeks to address this issue.

In the academic literature, such developments are addressed by a number of social science theories such as reflexive modernisation (Giddens 1990) (Beck, Giddens et al. 1994), the risk society (Beck 1992; Beck 1999), and normal accident theory (Perrow 1984). All three of these perspectives suggest that traditional risk reducing mechanisms may, in practice, be unlikely to reduce risk. Instead, a new perspective that comes to terms with this inability is called for that will help put in place the appropriate mechanisms that will make it easier to cope with any eventuality in the best possible way rather than trying to prevent them from occurring, limiting as far as possible any potential negative consequences. According to Beck, "the gain in power from techno-economic progress is being increasingly overshadowed by the production of risks" (Beck 1992; Beck 1999). Increased hazards and risks, therefore, are the logical consequence of progress.

Not only are there more risks and hazards, but they are also increasingly unpredictable, both because of the side effects being generated but also because it becomes increasable difficult, if not impossible, to trace them back to particular events, places, or decisions (Klejnstrup 2003). As interdependency and interlinkages increase, the intensity of potential risks as well as their likely consequences expand dramatically. Contingent events in a local context can ripple through a much wider space much more rapidly. This process is enabled by what are termed disembedding mechanisms that make possible the extraction of activities from a local context and their reorganisation across much larger scale jurisdictions and areas (Klejnstrup 2003).

The formalisation of information into symbolic tokens (e.g. money, stocks, standardised forms) and systems of experts and knowledge that contributed to the development of regimes of universality and objectivity (Klejnstrup 2003) are central to this process. Another idea that is central to reflexive modernisation is the way social practices are constantly reassessed in the light of new knowledge regarding these practices, constitutively altering their character.

Rather than this new knowledge helping to increase control, however, as Beck writes, "the expansion and heightening of the intention of control ultimately ends up producing the opposite. It is not knowledge but rather non-knowledge that is the medium of reflexive modernisation" {Beck, Giddens et al. 1994}. More knowledge in this analysis serves to reveal the greater complexity of the world around us. On the contrary, efforts to control the increased complexity and uncertainty contribute to it further by creating yet more interconnections and unintended consequences, increasing the need for control yet further.

Echoing the thinking found in the writing about the risk society and reflexive modernisation but in a more technological context, Perrow argues the complexity and interdependencies found in high-risk technologies are such that no matter how effective conventional safety precautions are, some form of accident or failure becomes inevitable because even a small failure in an insignificant component will quickly spread, leading to a much more serious, if not catastrophic, failure of the tight and complex couplings that make up the system (Klejnstrup 2003).

Although prime brokerage arrangements can provide many benefits in trms of managing credit risk, other risks, such as operational and concentration risk, also need to be taken into account and corrective measures put in place to ensure that risk is not simply displaced or transferred rather than overcome. It is because of such concerns that risk management innovations such as prime brokerage been accompanied by a growing awareness among market participants of, and interest in, issues relating to the design and adoption of standardised interoperable business processes and the standardisation of interfaces and technical protocols. This is because such initiatives are seen as a way of creating a more "plug-and-play" environment between different ICT infrastructures and the market participants these infrastructures connect. This, in turn, can contribute to achieving the structural flexibility necessary to deal with a rapidly changing and unpredictable economic and financial environment full of difficult to assess and rapidly propagating and potentially destructive side-effects, as suggested by thinkers such as Giddens, Beck, and Perrow.

This approach represents a good example of how, rather than trying to predict and anticipate risks that may not actually be fully knowable, mechanisms and structures that are adapted to an environment of uncertainty and volatility are called for. Flexibility and choice in terms of quick reconfiguration and re-routing of vital transactional relationships is needed, as is the ability to quickly dissolve links in order to limit contagion. With the Internet providing the global infrastructure that supports and makes possible rapid and remote decision-making, the timely availability of the necessary information becomes essential support for decision-making in such conditions.

Among all the actors, artefacts, and processes that make up the infrastructures that link market participants and enable them to transact, objects of central importance are the sets of messages and other standardised documents that make the transaction possible by crossing the organisational boundaries of all market participants. This is because electronic messages and standardised documents support the entire transaction, from one counterparty, via the shared infrastructure, to the other counterparty. They can be seen as drivers of processes of reflexive modernisation and globalisation due to their importance as the kind of symbolic tokens discussed previously and that make possible the disembedding of activities from their local contexts and structures and their re-organisation across larger scale jurisdictions and areas through regimes of universality. Seen in this way, participation in the design of these objects and involvement in the process and definition of the terms of the disembedding out of which a new universal regime, or system of expertise, is established is of crucial importance to those likely to be affected by the resulting regime.

In the pre-Internet era these messages took the form of paper orders, invoices, remittances, cheques, contracts, agreements and other physical documents which structured information pertaining to a transaction, contributing to its successful and uncontested conclusion. Now, pressures from growing volumes, the increasing complexity of transactions, and demand for services with a greater geographical reach and speed coupled with the need to quantify and manage larger financial risks, have resulted in an ever increasing proportion of financial service companies migrating to online forms of document and information interchange. Their structure and exchange have significant implications for the way transactions and relations among market participants are organised, as well as in terms of which other market participants one can trade with.

It is in this context that the new technology of XML (eXtensible Markup Language) is of critical importance. By seeking to overcome the rigidities and inflexibilities of the previous generation of EDI electronic messaging technolog, markup languages such as XML provide a way of exchanging structured and semi-structured documents in an application-independent way and in a manner that the necessary definitions of how to make sense of the logical structure of a document are also included in the document. Through the use of Document Type Definitions (DTD) that describe the relationships between the elements and attributes of a document, applications are able to recognise both the type of document and its component parts and process them accordingly. As a result, "the author of the document can ensure that the XML document is parsed and presented correctly"(Adam, Gangopadhyay et al. 1999).

XML represents a significant shift from EDI messages, which relied heavily on specifying a precise set of data elements with defined and immutable characteristics that were then combined into defined data segments and transaction sets, again precisely defined into functional groups for various industries. It meant that unless two counterparties were in rigid agreement as to the way the information was exchanged, they could not transact electronically. Their systems had to be set up in exactly the same way regarding transmitting and receiving data, with the same field and data definitions and using the exact same message syntaxes. As a result, EDI had to rely on standards organisations for the development of shared meanings and definitions and their embedding into the message structures. In practice EDI was only working in well-defined but limited vertical markets. The Internet economy, however, is open and requires links across sectors, operational functions, and organisational boundaries. Furthermore, the high cost of EDI, both in terms of up-front investment and maintenance made the technology too expensive for both SMEs and economic actors in emerging economies to use. With XML-based messages, however, standardisation moves away from trying to establish a lowest common denominator in terms of actual message content that can be understood and interpreted across systems and organisations in exactly the same way, to focusing instead on defining ways in which structured - but not rigidly defined - message content can be interpreted in a standardised way.

The Practical Challenges

As has already been described, the strategy developed by Shell in 2000 to improve interaction with FX markets for its corporate treasury centred around three initiatives:

1. An investment in the Currenex multi-bank FX portal;
2. The development of the prime brokerage model in a manner that suits corporate needs;
3. The development of open market standards for interoperable business processes and their technical implementations.

With regard to the first component of the Shell treasury strategy for FX, the investment in the bank-independent FX trading platform, the initiative was perceived as a threat and a challenge to the position of the major international banks that transact in FX markets.

The active financial and functional support given by Shell to an independent multi-bank platform, nonetheless, delivered a solution to the marketplace through which corporate treasuries and fund managers could simultaneously transact with as many banks as they wished. The banks responded with the establishment of two bank-owned FX trading platforms that would provide multi-bank transactions but in a manner controlled by their owners (i.e. the major global trading banks). Significant sums of money were invested in these bank-led platforms to automate the price forming and operational handling aspects of the transactions at the bank end. The services of these platforms were offered for free to corporate customers and actively marketed with the help of the sales forces of the FX departments of the banks that owned the two portals.

The vast majority of banks that owned a bank-led platform did not transact FX via the Currenex platform, even when requested to do so by major clients. As a result, the volume of transactions via the three trading platforms grew less rapidly than anticipated leading to one of the bank-owned platforms being closed down within a year, causing a write-off of US$90M for its four owners (Reuters, Citibank, Deutsche Bank and JPMorgan Chase).

With the remaining bank-led FX platform offering a broad range of bank liquidity providers without charging corporates for its services, Currenex was faced with an inability, for the first three years, to either offer transactions with most major international banks or to charge corporate customers for its services. This led Currenex to redirect its focus away from corporates to hedge funds that, it was anticipated, would appreciate more the benefits of flexible trade execution mechanisms, but also to drastically reduce its cost structure until cash break-even was achieved in early 2004. Having reached break-even and with increasing volume passing though its platform to a loyal set of customers, several major banks started to eventually provide FX transactions to corporate treasuries via both the bank-owned trading platform and Currenex. The arguments used by the banks to justify this change of approach were an eagerness to respond to customer demand and a desire to maintain a certain number of trading platforms in the marketplace, thus reducing the operational and commercial risks of a concentration of activity on one trading platform that then became a dominant and controlling supplier of

information and infrastructure services.

With regards to the second component of the Shell FX strategy, enabling multi-bank prime brokerage services for corporates, the idea was met with interest by a range of banks, but did not lead to major activity until recently. Early in 2001 Shell entered into discussions with 27 second and third tier banks to develop a multi-bank prime brokerage model for FX, making use of the infrastructure provided by the FX trading platforms. The intention was to allow banks to focus their delivery of FX transactions on those currencies that they could service well, delivering FX transactions of other currencies to their corporate customers with the help of other banks via the kind of prime brokerage model described in this article. This would also allow banks that were not interested in incurring market risk for FX transactions but had a core competence in credit provision to a wide range of local banks to offer their credit services in an automated and hence efficient manner.

The assumption was that the second and third tier banks would be keen to counter the moves by the dominant first tier FX banks to control market processes, a position that would, over the long term, enhance their ability to maximise the fees they could charge for transactions executed by the lower-tier banks via the bank-owned FX portal. In practice, however, the smaller banks were not prepared to counter the major banks before the multi-bank prime brokerage model was established as a common practice with a few major banks and before the Currenex platform had proved it could be successful. The discussions were sufficiently positive as to encourage Currenex to develop the necessary prime brokerage functionality regardless. This functionality, however, was not put in place with the banks engaged in those discussions due to issues relating to the aggressive marketing by the then management of the Currenex platform of the solution as an opportunity for corporates to transact FX directly with other corporates. Eventually, following the restructuring of Currenex and a change of management, the prime brokerage model was quietly implemented with a major non-bank financial institution that used it to offer FX transactions to smaller fund managers and with the necessary credit intermediation provided by a major prime broker bank. This also served Currenex well in its penetration of the hedge fund market, with most hedge funds using multiple prime brokers for the execution of their FX transactions.

With the general interest in FX execution via FX portals increasing and the portals themselves becoming more mature, there is an increased interest from second and third tier banks to provide liquidity via these platforms. Existing prime broker banks have shown an active interest in helping second and third tier banks offer FX liquidity to hedge funds with an intermediate credit service. Where the settlement of the resulting transactions can make use of the CLS service the prime brokers see this as an opportunity to increase their business without extending significantly their credit and operational risks and without major costs as processing could take place using the existing informational infrastructures (trading platforms plus settlement services) connected to the internal infrastructures of the prime broker banks and with a prime role for the prime brokers in managing the contractual credit arrangements. On the other hand, the appetite of prime brokers to enter the corporate FX market has been very limited. Most larger prime brokers are part of global or regional banks that have existing FX execution relationships with corporations. These banks expect that prime brokerage, with its direct access to multiple liquidity providers, may further erode their FX execution margins. It means that prime brokerage for corporates can only be driven by corporate demand, which, in turn, depends on the attractiveness of, and easy access to, alternative providers of FX liquidity.

Within such a context another development that has been remarkable is how slow local banks in emerging markets have been in responding to the opportunities offered by the possibility of relatively low-cost access to international markets using a combination of e-commerce, prime brokerage and low-risk settlement services like CLS. It seems that many have simply accepted that multinational corporations have irreversibly moved their activities away from them to regional and global banks.

The growth of hedge funds may have a positive side-effect in this regard. The exponential growth of hedge funds and the exposure to them by prime brokers in particular has raised the attention of central banks. The Bank of England, for instance, has established a working group with the primary objective of making recommendations on the minimisation of the growing concentration of operational and credit risks relating to prime brokerage. The workgroup has been further requested to analyse developments in electronic execution in FX markets in relation to these issues and is, as a result, also focusing on enhanced market access and efficient processing. It may well be that the activities of this working group lead to a further standardisation and controlled operation of prime brokerage services and further roll-out of electronic solutions that support more open and efficient market access. This might be a good opportunity for banks in emerging economies to become more actively involved in the process, ensuring

local barriers to international markets are addressed, whilst entering these more efficient and open international markets more aggressively themselves.

The third component of the Shell treasury regarding FX markets, the development of interoperable XML standards, was met with enthusiasm by banks, inter-bank FX trading platforms, inter-dealer brokers, corporates, fund managers and treasury application providers. In this direction, in early 2001 Shell initiated the Transaction Workflow Innovation Standards Team (TWIST) with the help of PriceWaterhouse Coopers, Currenex and 10 corporate treasury application providers. Within four months the group published the first set of XML-based electronic messaging standards for the integration of FX trading platforms with back-office systems. The next step was to extend the design of the standards to the full lifecycle of FX transactions, hence covering the identification of trade requirements, credit checks, splitting and aggregation of transactions, electronic price negotiation, transaction execution, post-transaction execution events like the alterations of settlement dates, small adjustments to amounts, rolling forward of transactions, cancellations and closing out of transactions as well as the settlement process and reconciliation of payments with transaction information.

These message standards that cover the trade lifecycle and which are driven by an interoperable business process design were published by TWIST in October 2002. In spite of this and the breadth and perceived quality of the design and the user-friendly publication on the TWIST website, there was limited activity by market participants in terms of implementation. The feedback received was that though the idea was welcome, it would have a higher chance of endorsement by corporates when standards for payment processing could also be included. This related to the perceived extreme inefficiencies of the payments processes and for which corporate treasuries were bearing most of the burden within their firms. As a result, standards for payment processing and supply chain financing were also added in 2004, providing a set of standards that covers 90% of the activities performed by corporate treasuries.

At the time of writing (April 2005), several major corporates and banks have started with the implementation of the payment and transaction-related message standards, with the expectation being that broad uptake of the related business processes will take place over the subsequent 12 to 24 months.

Concluding remarks

One key observation that can be made from the practical experience of implementing the risk management strategy outlined is that Shell faced the classic implications of lock-ins, the inertia of an installed base and strong existing alliances when it attempted to influence the available service offerings in FX markets.

Unsurprisingly, a number of participants in the system, such as financial and other service providers, intermediaries, integrators and IT vendors with established market positions, see an interoperable, XML-based, infrastructure as a threat to central elements of their business models and lucrative customer lock-in situations. In addition, the greater determinacy of EDI links in conjunction with the greater control over the connectivity infrastructures that intermediaries can exercise, also provide a mechanism for risk management - or at least risk displacement - and the comfort of service level guarantees. The price of this is a closed, inflexible, and vertically ordered market with little dynamic for growth. In this sense, while XML messaging represents a valuable technological solution, the institutional elements of a potential new techno-institutional infrastructure, such as contracts that can accommodate open business procedures without lengthy up-front trading agreements needing to be negotiated, are not perceived as being yet in place.

In order to overcome the resistance of the tightly knit and held together techno-institutional network reinforced by a large installed base of EDI technologies and that has little perceived need to change, it is crucial to make a strong case for greater interoperability and the importance of structures ? whether organisational, institutional, or informational ? that enable and facilitate the managing of unforeseen and unexpected hazards and risks instead of taking an approach that tries to design for all specific risks and situations.

Corporations and organisations such as the members of the TWIST initiative presented here, many of

which have to exist and operate in emerging as well as mature markets, have an interest and clear understanding of the importance of such flexible structures gained through their practical understanding of operating at the vanguard of globalisation as described in the academic literature presented in this article. Through their support for initiatives such as TWIST, they have, in a sense, taken on the role of educators or ?institutional entrepreneurs? who bring together those stakeholders with an interest in ensuring that the emerging global financial structures are both efficient and as risk free as possible (Fligstein and Mara-Drita 1996).

It may be, however, that, as Hughes suggests in relation to historic accounts of the development of large scale technological infrastructures, it is through a crisis that a radical innovation succeeds in leading to the formation of a new system or network (Hughes 1983). In the absence of supranational institutions empowered to direct the design, construction, and operation of emerging global financial infrastructures, it will be down to corporations with an interest in the integrity, efficiency, and resilience of this system or infrastructure and who have an interest in avoiding a crisis to put in place the arrangements and structures necessary and informed by their operational experience to bring it about. The speed of adoption will then be driven by those corporations that are not satisfied with the services of regional and global banks in conjunction with the ability of local banks to understand how to help themselves by pro-actively gaining better access to international markets through formulating strategies to take advantage of the opportunities provided by standardisation, automation, and the use of innovations such as prime broker services presented in this article.

For financial institutions in emerging markets, the swing of the pendulum described in the academic literature presented in this article from a logic of production and efficiency to one of managing the risks produced by the drive for efficiency is an opportunity to regain the foothold they had lost in the global financial system. The centralisation of control and funds from the periphery to the centre made possible by the development of ICTs has enabled the easier and more cost effective coordination of activities across time and space and the disembedding of activities away from local contexts. As the unanticipated risks of these developments start to become visible and the exigencies of having to think globally but act locally and the complex interdependencies that can give rise to unpredictable risks come centre-stage, there is a clear opportunity for their re-integration into a system that is becoming more and more top heavy and centralised.

There are also implications for the structure of the international banking sector and the configuration of the inter-relations and relative competitive positioning of the banks that comprise this sector. The separating of the transactional from the informational components of trading that would be made possible by the spread and growing adoption of an "open" multi-provider and multi-hub prime brokerage model enables small and medium size financial service providers that are not necessarily able to provide the credit risk profile that a large credit worthy counterparty may demand, to interact and transact with this counterparty via the intermediation of a prime broker.

Through initiatives such as those developed by Royal Dutch Shell, local banks, by transforming themselves from transaction processors to trusted and knowledgeable local market information providing partners, can gain substantial benefits in the new emerging order, or universal regime, of the global financial system. This is especially so in emerging markets where local market knowledge and access to local ?natural liquidity? and market signals and early warnings are of value for global corporations looking for ways of dealing with volatility, reduced liquidity, and local market specificities.

References

Adam, N. R., A. Gangopadhyay, et al. (1999). Electronic commerce : technical, business, and legal issues. Upper Saddle River ; London, Prentice Hall.

Beck, U. (1992). Risk society : towards a new modernity. London, Sage.

Beck, U. (1999). World risk society. Cambridge, Polity Press.

Beck, U., A. Giddens, et al. (1994). Reflexive modernization : politics, tradition and aesthetics in the modern social order. Cambridge, Polity Press.

Buthorn, J. (2003). The ongoing evolution of prime brokerage, Eubfn.com - LS Technologies Ltd.

[Website]; Last accessed April 2005, http://www.eubfn.com/arts/768AIG.htm

Fligstein, N. and I. Mara-Drita (1996). "How to make a market: reflections on the attempt to create a single market in the European Union." American Journal of Sociology 102(1): 1-33.

Giddens, A. (1990). The consequences of modernity. Cambridge, Polity Press in association with Blackwell.

Hughes, T. P. (1983). Networks of power : electrification in Western society, 1880-1930. Baltimore ; London, Johns Hopkins University Press.

Jung, G. (2004). The Prime Broker - a central part of the hedge fund industry, Eubifn.com- LS Technologies Ltd. [Website]; Last accessed April 2005, http://www.eubfn.com/arts/goldman_sachs.htm

Klejnstrup, M., Ritter (2003). Operational risk and normal accidents in the risk society: A case study of an IT failure in a bank. Department of Information Systems. London, London School of Economics: 1-47.

Perrow, C. (1984). Normal accidents : living with high-risk technologies. [New York], Basic Books.