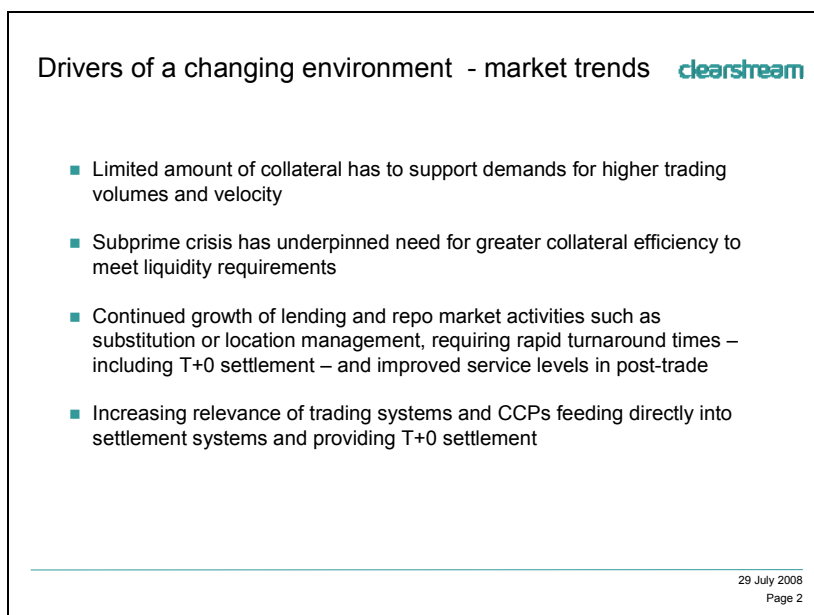


Jeffrey Tessler



A lot of changes that have happened recently in Europe have been on the infrastructure level. We started this morning on the asset management level. I am not sure if everyone on that level realizes what the true extent of the changes on the market infrastructure level is, and what the impact on the overall value chain is. In my old job I used to talk to asset managers about changes taking place in the market infrastructure. The typical message I received was, "We don't care. This is the brokers' problem. Do not bother us with this". The custodian level is well aware, but it is increasingly important for all parties to understand what key developments are happening on each others' turf.

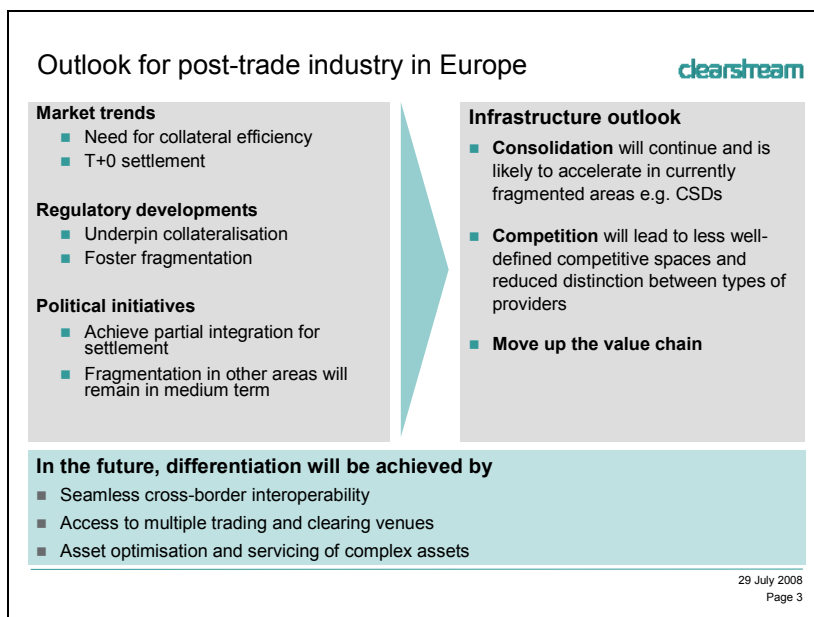
Let me make another brief comment from the perspective of the market infrastructure before I start with my assigned topic for today: This is an unprecedented period of time in terms of challenges facing the banking industry. From a stock exchange standpoint, from a CCP standpoint and from a CSD and ICSD standpoint, if we had to rate ourselves as to how we have performed in this period of unprecedented market volatility, I would not hesitate to give us an A+. If we, as operational service providers, had not performed well, the continued interest of individuals to buy financial instruments would not exist anymore today, because the entire capital market system would have imploded.



There have been some drivers behind the recent market trends. From our perspective, much has been around collateral. There is a limited amount of collateral to support ever higher trading volumes. We have, on a wholesale basis, eliminated vast quantities of collateral which were still considered prime collateral in July of 2007. We no longer talk about ABS, CDOs and similar securities that were readily accepted as collateral. They are gone. If they still have any value at all, it is certainly much less than a year ago. Last year, we used to argue at our repo desks about whether the margin should be 2% or 3%, and there would be passionate and lengthy discussions. Today, the discussions are about 30%, 40% or 100%!

The subprime crisis has really driven the need for greater efficiency in collateral management to meet liquidity requirements. What that means from a service provider standpoint is that we need to move towards real-time settlement on T+0, improved post-trade service levels, and quicker turnaround times. Real-time collateral processing is key.

Another phenomenon that we saw during this crisis was the gravitation towards CCPs. The CCP, certainly for exchange-traded products, eliminates the counterparty risk. During the crisis we saw that market participants started to move everything they could from the OTC market into a CCP environment. This trend continues. This is difficult for the extremely complex products, but we have seen it clearly in the repo market, where moves into CCP functionality have taken place and volumes have grown very significantly over the last two years.



When we look at the post-trade processing industry in Europe, things are really in the midst of change. The market trend I just mentioned is part of the reason. But that in itself would not be enough. It is really the regulators forcing change on the infrastructure. Whether it is the Code of Conduct, MiFID, TARGET2 Securities (T2S) – they are all focused on increasing competition. It is important to recognize that, when the regulators increase competition, they also increase the fragmentation of liquidity pools.

T2S provides a single point of entry for settlement. For core custody, you still have to use 25 local CSDs in Europe. That is not exactly a decisive move towards concentration. But it is a political initiative, and it will drive consolidation in the industry. We will see acceleration in the consolidation of CSDs. It may not be always consolidation in the traditional sense. We may see more joint ventures, more platform sharing – all in an effort to consolidate those fragmented pools of liquidity.

Competition will lead to less well-defined spaces between service providers. T2S is really forcing the CSDs to move up the value chain and become suppliers of a broader range of services to the industry. Some are well equipped to do that, others less so. T2S will create severe issues for smaller CSDs, because their settlement activity in central bank money – which will go away – comprises 40-50% of their total revenues. Their business models will be at risk. Clearstream's central bank money settlement activity contributes 6% to total revenues. That comes from our domestic CSD in Germany, and we would

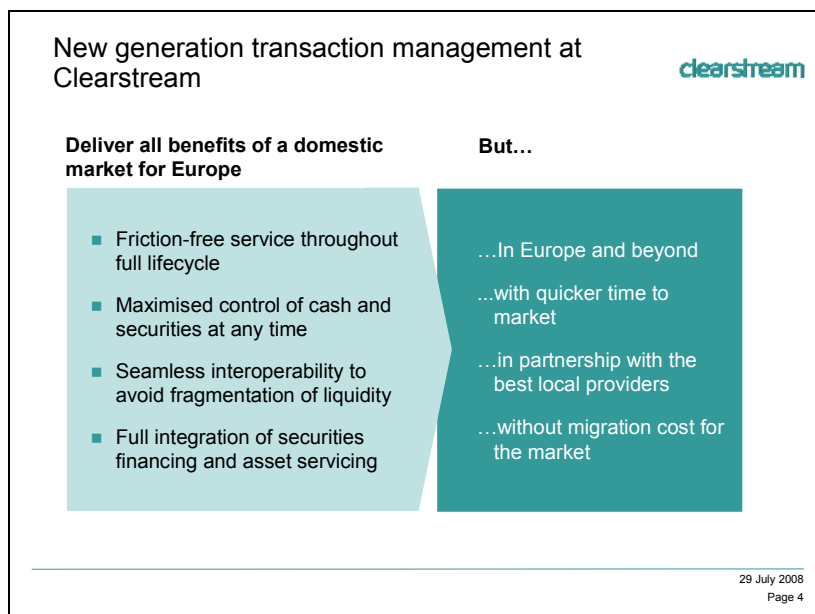
lose that. We are, however, well positioned to be a provider of cross-border services in the new environment. We already are in this position today in the fixed income market.

Why is Clearstream in favor of T2S? Quite frankly, we are not in favor, we are agnostic because we have an excellent business model. We are not losing much with T2S and, at the end of the day we are driven by our clients. They are clearly in favor of T2S and they expect us to be in favor of T2S. Clearstream is part of Deutsche Börse Group, a publicly listed company which is sometimes accused of only listening to the shareholders and not to its clients. It is somewhat ironic that we appear to be the organization that is driven most by its clients, and coming out as probably the strongest of anyone in stating publicly that we are supportive of T2S.

In the future, the providers of cross-border services will be positioned best. The key is the ability to provide cross-border interoperability, because we are not going to create a single platform for the entire world. We may do so in Europe over time, but not globally. The key to the future is to provide seamless interoperability into those fragmented pools of liquidity around the world, and also the ability to tie into multiple trading venues. We see many new ones develop – particularly in Europe, but in other regions too.

The third success factor is to be best in class as it relates to asset optimization and servicing of complex instruments. This is what Neeraj Sahai referred to as the black box and customized approach all in one. People want costs to go down significantly. They want the benefit of a black box. But the new products that are being created and that we now receive in the infrastructure for servicing become more complex all the time, requiring a bespoke service.

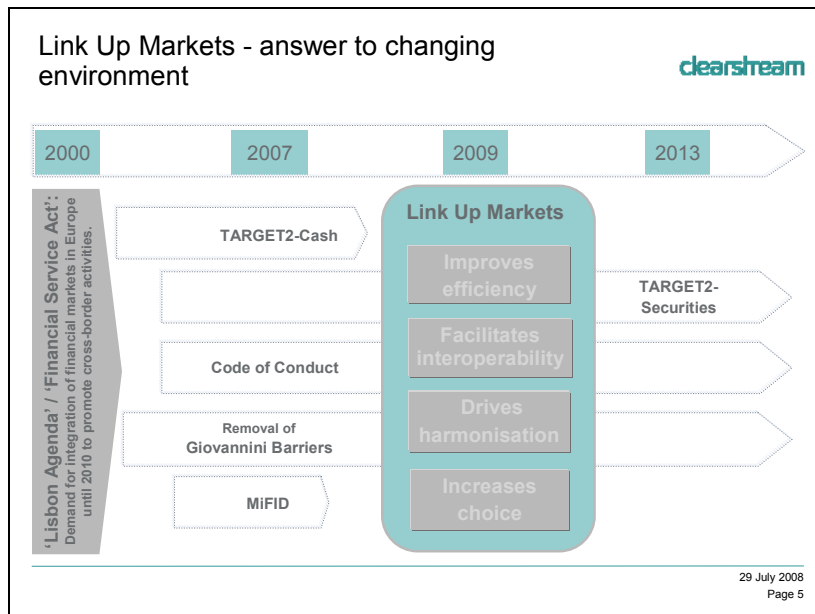
So it is really those organization who can strike a balance between delivering bespoke services and cost efficiency, who will be the winners going forward.



This is not the place for sales pitches, but let me mention that we just launched our real-time processing engine; a big move from batching. Not just real-time settlement. We now manage the full investment lifecycle in real-time processing: Interaction with the local market, reporting, fails management, repo reporting etc. are all done now on a real-time basis.

The idea behind it is "plug and play": We want to give our clients the ability to draw the best of breed from each local market, by having real-time processing in that local market. It is not limited to Europe, although we are most advanced in the European market place.

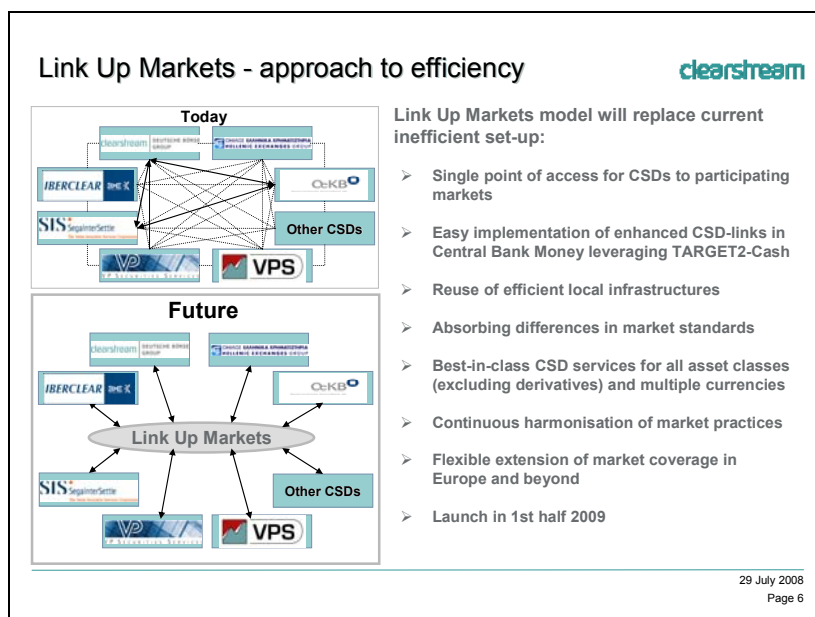
What most people probably expect me to explain today is the concept of our recently announced "Link Up Markets" project.



Link Up Markets is simple and that is the beauty of the concept. It is all about re-using the existing market infrastructure within Europe. As a matter of fact, the domestic market infrastructures in Europe are highly efficient. It is equally a matter of fact that the Swiss like their market infrastructure, so do the Germans, the Austrians, the Spanish and so on. The conflict we have in Europe is with applying the Anglo-Saxon model to Europe, by saying that we need a single DTCC for Europe and that is the only way to go.

Because of Europe being Europe, and the issue of national interests being so strong, we have gone nowhere yet in terms of achieving the ultimate goal: a single market place for Europe.

So we have been thinking about ways to move forward, and we came up with a different model for Europe. This has been in the works for about two years. One year ago, we initiated contacts with a number of other CSDs. We need something fast and efficient, and we need to bring the market what it wants. We think that our proposal can be implemented quite quickly. We worked for a year as a team. In April of this year in Madrid, we were ready to announce the formation of Link Up Markets.



At the moment, Link Up Markets includes seven CSDs in Europe. You could think that those seven do not account for much weight. In reality, they represent 50% of the total of Europe's combined domestic transaction volumes. The seven CSDs that have come together definitely represent a significant force in

terms of what they undertake to develop.

The company has been created. Capital has been committed, and we are in the process of developing a converter technology to take the efficiency of one domestic market and expand that into seven markets. This should significantly reduce cross-border complexity and the cost of cross-border transactions by providing a single window into all seven markets.

The way it will work is like this: Each one of us is what we call an investor CSD. A client can pick whatever investor CSD he would like. That CSD will be his single point of access to the other CSDs who act as issuer CSDs to the investor CSDs. The investor CSD opens up accounts with each issuer CSD. The key to what we are doing – and the reason why it works now quite efficiently – is the arrival of TARGET2 Cash this year.

TARGET2 Cash makes the implementation of links easier. Instead of having to have a one-on-one relationship between each CSD and each central bank, you can choose any TARGET2 Cash central bank that you wish. The days where Clearstream Frankfurt absolutely needed an account with Deutsche Bundesbank, and Iberclear needed an account with Banco de España are over. You just need one account.

What we are building is basically a translator. The idea of the translator is to absorb the differences between local market standards by translating and mapping the market standards of one country to those of another. So, by entering Link Up Markets for instance through SIS as the investor CSD with the intention of accessing the Danish market, the client can buy shares at the Danish stock exchange, have them cleared through the Danish clearing company, settled in the Danish market and then transferred them back on a translated basis into SIS. The benefit for the client is, if he is happy and comfortable with the standards used in SIS, he does not have to worry about the standards in other countries; SIS will absorb the differences through its use of the converter.

We think that we can bring the cost of cross-border settlements down by up to 80%. We are eliminating the efficiency of a cross-border settlement as it exists today and are replacing that with a domestic transaction. It is clearly recognized in Europe that domestic transactions are as efficient as they are in the US.

The benefits of Link Up Markets are summarized again in the slide below.

	Benefits for market
Streamline market access through single window	✓
Reduce complexity of cross-border business	✓
Harmonise processes across markets	✓
Leverage existing local efficient CSD infrastructure	✓
Minimise adaptations to infrastructure developments	✓
Increase trading activities driven by market integration	✓
Benefit as of 1st half 2009	✓
Potential to reduce existing cross-border settlement costs by up to 80 %	

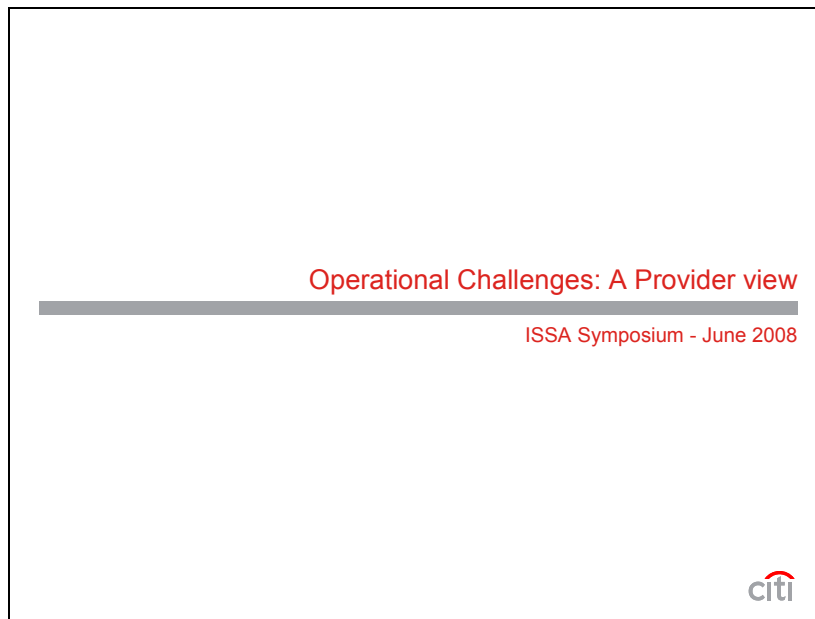
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A critical question to answer is: How can you do this as cheaply as you say? The answer is that we are not building a settlement engine, and we are not creating a new domestic or a cross-border market infrastructure. We are using existing functionality. There will be additional adaptation costs for each participating CSD in order to plug into Link Up Markets. The cost of the converter, however, is rather modest. It does not involve rocket scientist technology.

The other issue we hear is the time frame. We are confident that we can have Link Up Markets up and running by mid-2009. When you talk to broker-dealers about market initiatives with completion dates in 2013 or 2014, they tend not to be interested.

An important point to clarify: Link Up Markets is not meant to be a replacement for T2S. It is rather a facilitator for T2S. In the T2S environment, if you have that single point of access to the T2S settlement engine, you should have a single point of access to the core custody functionalities of a CSD as well. Otherwise the value of T2S will not fully materialize. We have already expressed that to the European Central Bank. They watch us cautiously but they understand very clearly what we are doing.

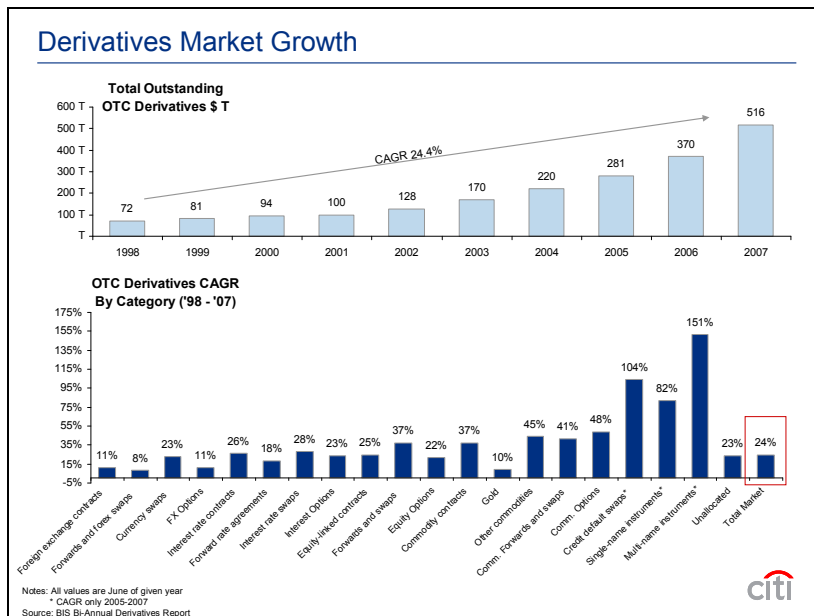
If we succeed in reducing the cost of cross-border transactions by 80%, and if we are in the market a year from today, questions could in fact be raised as to why we still need T2S. The Euroclear group has roughly 50% of market volumes, Link Up Markets would have roughly 50%, and both initiatives bring down costs. In the end, it is up to the market to decide if it wants T2S.

**Neeraj Sahai**

My part is to summarize how we see the world from our perspective as a global custodian, and what is happening in our business. In our sequence of discussion fields, we are now moving down the value chain. It is not just the value chain, it also is the food chain. If you are positioned lower in the food chain, you do more work, you get less compensation and you get all the blame!



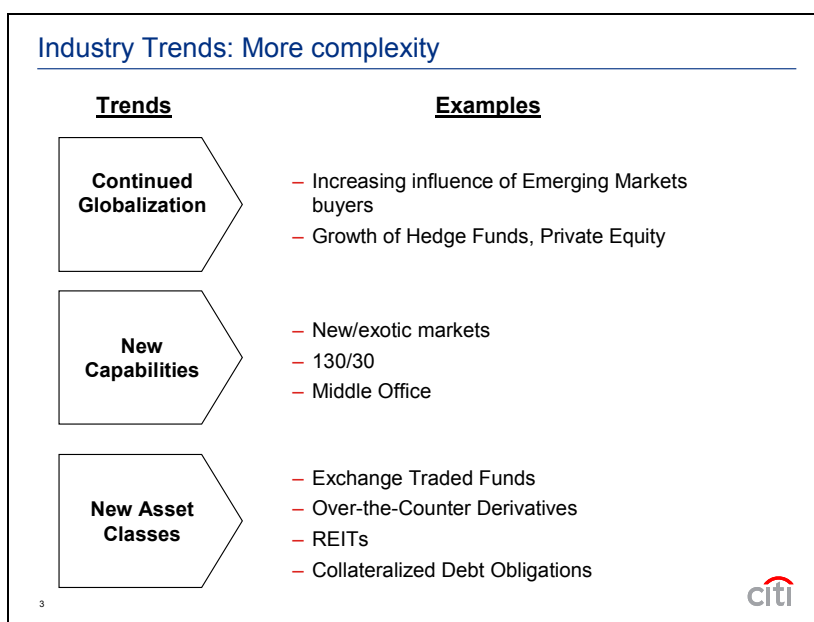
The key challenge for the global custodians is to do more for less. That is the paradigm and it is reflected in terms of the rising complexity at the front end, which finds its way down along the food chain. The complexity is increasing, but nobody is willing to pay more for that complexity – whether it is all of us as investors on the retail side, or as participants in a pension scheme, or on the institutional side for an asset manager having the ability to charge more to its clients, or to pay more to its service providers.



To underline my point, this chart shows the growth of notional outstandings for OTC derivatives. The compound annual growth rate (CAGR) is 24%. If we project this out even at a cautious 15% CAGR, we are still talking about one trillion dollars more outstanding by the end of 2008!

At the bottom of the chart the OTC derivatives are listed by type. You can see the proliferation of products. That reflects the increasing complexity that comes along with the volume growth.

The lifecycle of OTC derivatives is very different from that of ordinary cash equities or bonds. We are talking about confirmations, about collateral management, about non-structured contracts. There is the drive to create Alpha through the use of these instruments, or to hedge risks through the use of them. By nature, these products have to be non-standard. If they were very standardized, then they could not serve their purpose. On the operational side, there is of course the desire to create standardization even on something which by nature should be non-standard. This gives you an idea of the challenge.

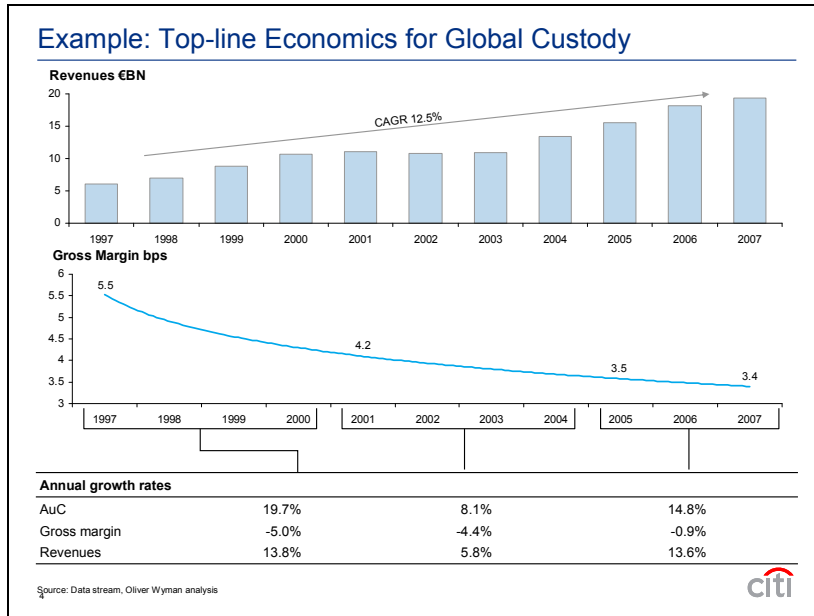


Let's look at some factors that drive increased complexity.

Globalization has traditionally been viewed as a trend where funds move from the more developed markets to lesser developed markets, in search for greater returns. Today, as we heard this morning, the new markets are also becoming sources of funds, not just destinations for funds. This is true on the retail

level, the high net worth level and also on the institutional side.

This situation requires new capabilities. The product developers need to bring new products to market which need to be customized so as to allow the local front end managers to tap into those new pools of capital. Again, the result is more volume and more complexity.



This slide reflects the growth of global custody volumes, which amounts to about 12% compound annual growth. The bottom half represents the margins and therefore the prices in our business. One is a steep curve upwards; one is a steep curve downwards. The only good news is that it cannot go much further either way! The point again is that we have growth in volume, growth in complexity, and very little room to play with the margins.

**Three types of responses**

- Outsourcing or off-shoring
- Process re-design
- New technologies

How have the market players responded to the challenge?


This is not only valid for custodians, but for asset managers as well. The first reaction obviously is: How can I cut my costs? One of the first responses was to move work around in one's own country. Backoffices have been moved from Wall Street to cheaper locations within the US. In a second step, work is offshored to other world regions.

The second response – often before we outsource or offshore, is process redesign. How can we make processes more efficient, more straight-through? This has happened but there are constraints, as we heard in other presentations today: for instance by the disparity in infrastructures we are using, by the lifecycles of different economies, by different regulations, by different tax regimes, and also by new technologies. Some of the new technologies are not coming from well-established companies in the financial services world but from niche providers. They are often in the hands of private equity firms and have not got industrial strength yet. Working with them often poses challenges.

Consolidation is another trend. At the end of every food chain, consolidation has occurred. The large players become bigger and bigger. Fewer and fewer people own the assets, buying from fewer asset managers who in turn buy from fewer custodians or other service suppliers. That kind of countervailing power is developing in our food chain with the hope that consolidation will yield scale benefits and drive down the costs. That is a macro trend in our industry which is very difficult to fight.

No panaceas

- Scale benefits elusive where products, inputs, channels increasingly diverse
- Co-ordination, exception handling, and workaround costs can mount
- Complexity impacts service levels as well as variable costs
- Out-sourcing (and in-sourcing) are impacted: “cannot out-source spaghetti”



However, having said that, the scale benefits are elusive when products, inputs and channels are very diverse. Scale is based on the concept that you are manufacturing a uniform product. The more of the same product you are manufacturing on a constant and stable technology platform, the higher your scale benefits. But that concept does not work in an industry which is highly innovative at the front end. Pure scale in our industry is not so natural and not very easy to attain. That is an important factor to keep in mind.

The other evidence in this industry – and that does not just hold true for financial services – is that, when you have a complex value chain, or when you want to coordinate work across different locations, the amount of coordination required and the exception handling increases. This can go to a point where the cost of coordination offsets the scale benefit.

The variable cost is the war for talent. Everybody in our industry wants the same specialists. The hedge funds need skilled people to do the valuation of complex products. We as custodians need the same and so do the broker-dealers and the asset managers. The shortage of talent drives up the variable cost.

Companies often think that, when they have a problem, outsourcing the work to someone else would be the easy answer. Many lift-out models in our industry have not worked for that reason. If you outsource a mediocre operation, the operations manager changes, but the problems will not go away.

So what can we do?

### Need to re-define standardization

- Standardize components/activities not products/processes ( chips not CPUs)
- De-couple tightly integrated process chains to build flexibility
- Build simpler, well-defined, networked processes
- Standardize communication protocols – internal and external

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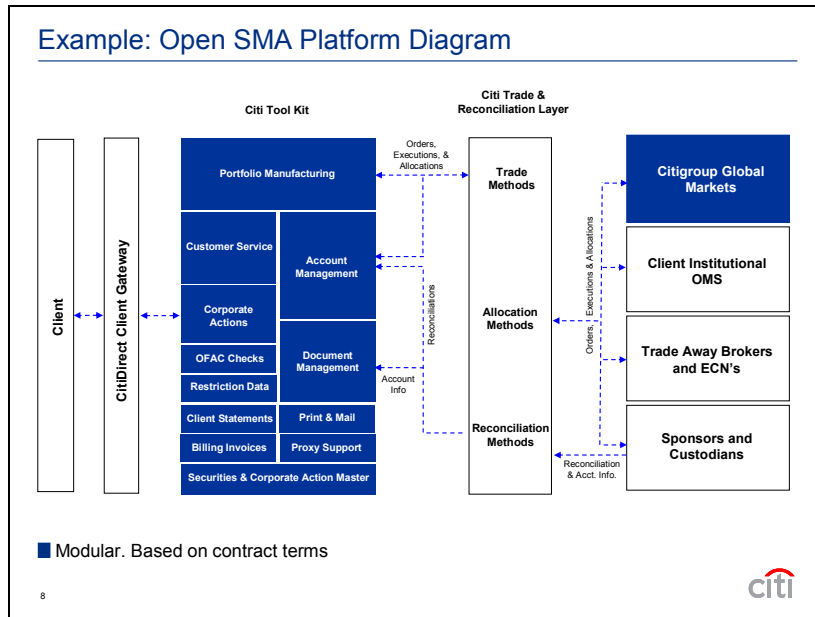


One way to respond is to standardize. Importantly, the subjects of standardization are the individual components, not the overall process. If you manufacture cars, you do not standardize the car, you standardize the components that go into the car. Dell Computers is a model case, too. They assemble standardized components and they have a supply chain management in place which is one of the best in the world.

Also, we need to de-couple tightly integrated processes. If you want to do reconciliation in one location, valuation in another, and clearance and settlement in a third, you first need to de-couple the process chain to create flexibility.

After you standardized and de-coupled the process, you need to find a way of linking the pieces together again in a network-type manner. That is a different kind of challenge.

Finally, if one has work spread across many locations, and then needs to integrate it back together, communication becomes very important. It is very difficult for me to explain to a client that his settlement is done in one location, his reconciliation in another, his valuation in yet another and his compliance monitoring in a fourth one, and that would be the way he receives the end-product I am selling to him. And even worse, if the product was flawed, leaving it up to the client to navigate around all those production nodes to find out what went wrong where. The complexity of the coordination effort for my process therefore rises. The architecture that is required for client interaction has to be very sophisticated.



This is one example to show how Citigroup has dealt with this. Our Separately Managed Account business in the US is one of the fastest growing businesses within this industry. It is essentially a cottage industry. Trying to standardize it is very difficult.

The blue elements and the underlying technology to handle those parts are mostly delivered by third parties. We use best-of-breed suppliers and packages, not necessarily always Citi proprietary technology. We became an integrator of a solution, rather than a manufacturer of a solution. Our time to market became shorter, our cost decreased, but it created different kinds of challenges. We are now coordinating about a dozen third party vendors in this process. And, as we all know, the speed of a convoy is the speed of its slowest ship.

That is just one way of dealing with a situation where prices are going down, the cost of doing the work is going up, and the complexity forces you not to do everything by yourself. You need to find partners who can help you. Sometimes those partners are your competitors, but that does not matter if you need one particular component only to fit into your overall service offering.

**One approach: Citi**

- Leverage presence across global locations
- Re-engineer and link discrete processes
- Use modular best-of-breed platforms
- Where possible, use plug-and-play architecture
- Hire and retain the right talent pool
- Stay client-centric not product-centric

This is to recap our approach at Citi. Certainly, it is one way only; there are no doubt other solutions:

Fortunately, Citi has global presence. Sometimes this gives us the option to offshore but not outsource at

the same time.

We have re-engineered discrete processes along the lines I mentioned earlier.

We use best-of-breed platforms, rather than trying to do everything by ourselves.

We use a modular, plug-and-play architecture so that we can replace one component with relative ease, should that become necessary. One should avoid too tightly integrated processes. If one element needs to be exchanged, the rest of the supply chain should not get impacted.

Finding and retaining the best talent is a constant challenge.

Lastly, you need to stay client-centric, rather than product-centric, because keeping your clients happy is the most important success factor of all.

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