

About us

# e finance lab

at the HOUSE OF FINANCE

Deutsche Bank 

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 finanz informatik



 T-Systems

 ESOT  
TRADING NETWORKS

 Interactive Data



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The mission of the E-Finance Lab is the development and application of research methodologies in the financial industry that promote and assess how business strategies and structures are shared and supported by strategies and structures of information systems.

# Mission of the E-Finance Lab

The financial services industry is believed to be on the verge of a dramatic [r]evolution. A substantial redesign of its value chains aimed at reducing costs, providing more efficient and flexible services and enabling new products and revenue streams is imminent. But there seems to be no clear migration path nor goal which can cast light on the question where the finance industry and its various players will be and should be in a decade from now. The mission of the E-Finance Lab is the development and application of research methodologies in the financial industry that promote and assess how business strategies and structures are shared and supported by strategies and structures of information systems. Important challenges include the design of smart production infrastructures, the development and evaluation of advantageous sourcing strategies and smart selling concepts to enable new revenue streams for financial service providers in the future. Overall, our goal is to contribute methods and views to the realignment of the E-Finance value chain.

## **Industry-Academic Partnership:**

The E-Finance Lab was founded in 2003 and is an industry-academic partnership between Frankfurt and Darmstadt Universities and partners Deutsche Bank, Deutsche Börse, DZ BANK, Finanz Informatik, IBM, T-Systems (all tier-1 partners) as well as 360T and Interactive Data Managed Solutions (all tier-2 partners), located at Frankfurt's Goethe University.

## **Personnel:**

Prof. Dr. Wolfgang König, Frankfurt University, chairs the board of the E-Finance Lab. Prof. Dr. Peter Gomber, Frankfurt University, and Rolf Riemenschnitter, Deutsche Bank, act as vice chairmen. The council of the E-Finance Lab supports the research.

The E-Finance Lab research is supervised by five professors and one junior professor:

Prof. Dr. Wolfgang König holds the Chair of Information Systems at Frankfurt University. Prof. Dr.-Ing. Ralf Steinmetz heads the Multimedia Communications Lab at Technische Universität Darmstadt. Prof. Dr. Roman Beck holds the E-Finance Lab endowed Chair of E-Finance and Services Science. These three professors preside over the layer "IT Infrastructure: Service Systems in E-Finance".

Prof. Dr. Peter Gomber, Chair of e-Finance, Frankfurt University is head of the layer "E-Financial Markets & Market Infrastructures".

Prof. Dr. Bernd Skiera, Germany's first chairholder of Electronic Commerce and Prof. Dr. Andreas Hackethal, Professor of Banking and Finance (both from Frankfurt University) head the layer "Customers in E-Finance".

## **Location:**

Frankfurt am Main is the Central European financial capital and amongst Europe's most important commercial and industrial centers. Frankfurt hosts more than 217 banks (more than 154 are foreign), the European Central Bank and one of the most important stock exchanges. In addition, the Frankfurt Rhine-Main area is an economic powerhouse in Germany and responsible for a major part of the national GDP.



The council of the E-Finance Lab supports its research. It comprises a representative of each tier-1 partner.

## Honorary Members



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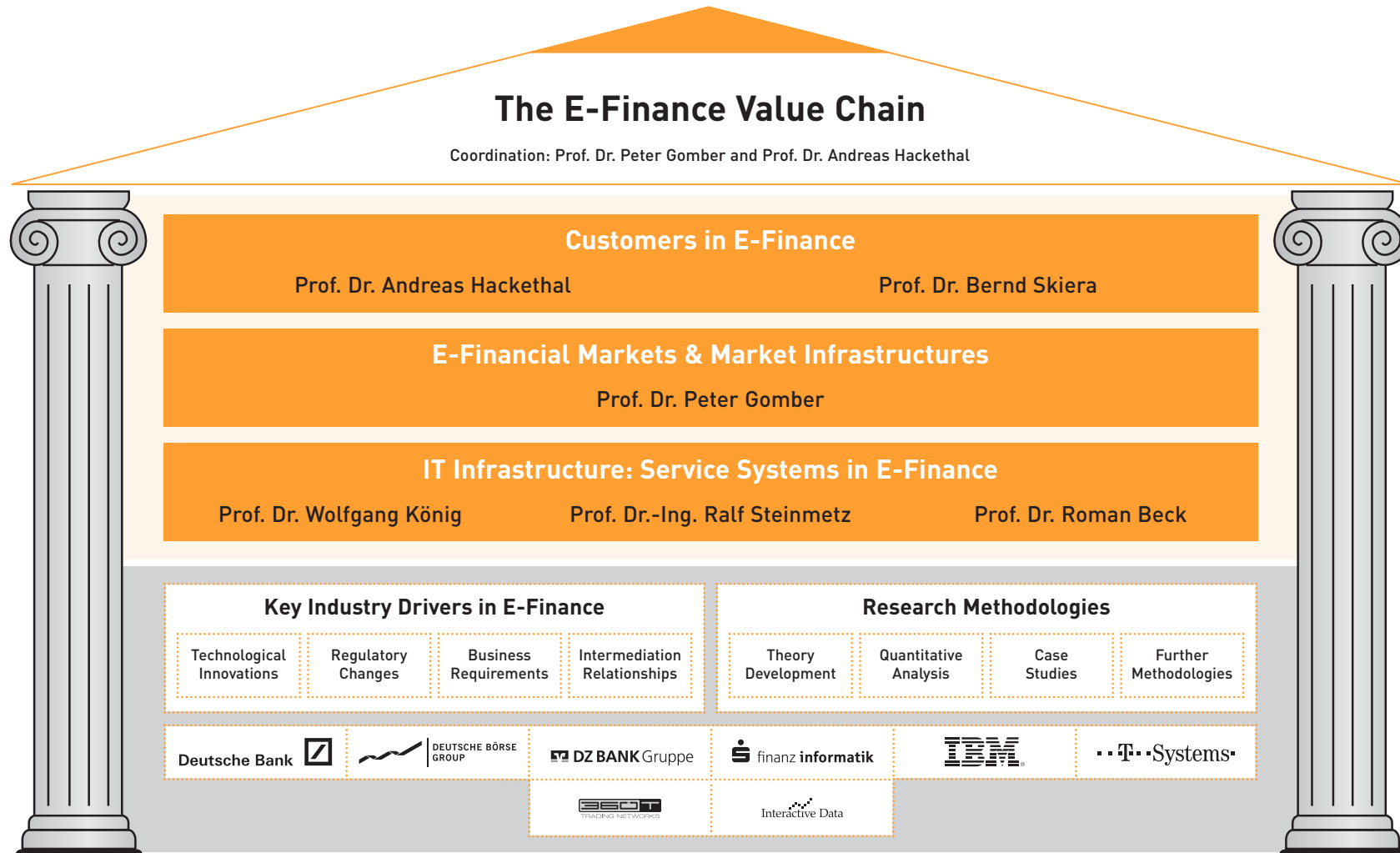




## Research

The overall research program of the E-Finance Lab consists of three distinctive areas, while shared methods and research questions result in interdisciplinary projects.

# Overall Structure of the E-Finance Lab's Research Program



# The E-Finance Value Chain

Prof Dr. Peter Gomber, Prof. Dr. Andreas Hackethal

**Mission:** The research coordinators integrate the research efforts and results of the three individual E-Finance Lab research layers in order to boost synergies and to allow a unified view on current technology-enabled trends in the financial services industry. Joint research, conferences and discussions are targeted at answering the question “What will the financial services industry be alike in ten years from now?” and “What is the impact of key industry drivers on the E-Finance Value Chain?”. Moreover, the research coordinators strive to encourage the use of established research methods in order to generate rigorous research results.

**Research:** Consolidation has been a widespread phenomenon in the financial services industry for many years. Numerous of today’s most admired firms have rapidly grown both in scale and scope. Given the strategic uncertainty about future core competencies and profitable business areas, becoming bigger and broader, and maintaining deep pockets seemed to be the safest option. We believe that the financial services industry is currently on the verge to a new competitive landscape in which much more focus is indispensable. Technological progress, the ever increasing importance of brands and reputation and the imperative to exploit cross-selling opportunities imply that horizontal scale and scope economies will remain of utmost importance. However, because the same technological advances boost the standardization and industrialization of business processes, an influx of specialized and highly efficient service providers will strongly erode the extent of vertical integration that we can still observe. We envision a rapid decomposition and reconfiguration of existing value chains into flexible value networks, in which players exclusively concentrate on their core competencies and IT plays a vital role in value creation. We also believe that the industrialization of processes will be complemented by relentless attempts of leading financial institutions to offering customized, relationship-oriented financial services to their customers through multiple channels. Relationship-banking will hence prosper, even in the light of intensifying competition.

The overarching research coordination aims at consolidating the relevant insights derived in the three layers to attenuate the strategic uncertainty and ultimately to devise viable strategies for industry participants to succeed in this new industry fabric.

The research agendas of the base layers are summarized below:

- **Layer 1 “IT Infrastructure: Service Systems in E-Finance”** elaborates on the question how to appropriately create, source, compose, secure and govern componentized services in a distributed environment of financial institutions. Thereby, the layer focuses on different services sourcing options, new paradigms for service provisioning and appropriate infrastructure solutions. Moreover, new methods, principles, and technologies are explored in order to improve the decision making within financial services institutions.
- **Layer 2 “E-Financial Markets & Market Infrastructures”** analyzes the “Securities Trading Value Chain” and its dynamics. The layer has a specific focus on the impact of market regulation, the intermediation relationships between the industry players and recent technological innovations in this field. Innovative brokerage concepts addressing both institutional and retail customers are also investigated in this layer.
- **Layer 3 “Customers in E-Finance”** proceeds from the basic premise that the online environment will further gain in importance for financial service providers and that customer management in such an online environment poses substantial challenges. The aim of our work is to analyze these technological trends carefully and to evaluate how technology and data intelligence can create value for financial service providers and their customers.





## Layer 1

Since IT infrastructures are the backbone of the financial services industry, the projects of layer 1 ask how to appropriately create, source, and manage IT-based services in the distributed environment of financial services institutions.

# IT Infrastructure: Service Systems in E-Finance

Prof. Dr. Wolfgang König, Prof. Dr.-Ing. Ralf Steinmetz, Prof. Dr. Roman Beck

In this layer we focus on three major work streams:

- **Services Management in the Field of Social Media:** In recent times, the communication behavior and - based on it - the generation of knowledge in information-intensive work environments has changed fundamentally due to new communication channels and social media platforms such as microblogging, wikis, forums, and social networks. Along with this development, a democratization of communication and knowledge sharing emerges which creates challenges for hierarchically organized enterprises. As explained by the social capital theory, networks of colocated employees with different capabilities and areas of expertise can create new knowledge more effectively and with higher quality than a group of experts within a specific domain. Combined with computer-mediated work leverage systems, Web 2.0 applications can become powerful instruments not only to create and share new knowledge but also to orchestrate the work balance across lines of businesses within and across organizations. Consequently, our projects in the area of Enterprise 2.0 are at the forefront of understanding the altering management of work environments and the corresponding impact on business process outcomes in globally operating and services-centered organizations.
- **Cloud Computing as a Solution for Services Sourcing:** In turbulent markets, it is vital for enterprises to actively respond to changing conditions by adapting their sourcing of business processes continuously. Especially financial institutions have to sense changes in market conditions and modify their strategies to adapt to the agile environment, according to the particularities of their business, e.g., by taking advantage of sourcing services from offshore providers or by applying Cloud computing to realize business processes based on "cloudified" services and applications. Hence, in this research stream we analyze outsourcing relationships as well as new paradigms for service provisioning (e.g., software as a service, platform as a service, and infrastructure as a service). In addition, potential infrastructures that support global sourcing strategies are investigated.

As an example, Cloud computing exhibits the potential to support a global environment of shared services with lower IT infrastructure and energy costs, as well as an improved scalability to meet the quickly changing demands of the financial services industry. Therefore, secure Cloud management systems have to combine technical and non-technical spheres to provide a platform for real-time, market-wide transparency, and accountability with respect to the requirements of market participants and regulation authorities. To enable first-hand experiences, the Frankfurt Cloud ([www.frankfurt-cloud.com](http://www.frankfurt-cloud.com)) was implemented in cooperation with E-Finance Lab partners as an infrastructure to investigate the effective management of Clouds and to examine the conditions to effectively use Cloud services in varying application profiles which differ in the demands for compute power, storage space, and communication intensity.

- **Services Creation through Service-Oriented Architectures:** This research stream analyzes the management of services within organizations, focusing on service-oriented architectures (SOA) which enable agile IT-supported business processes by concatenating loosely coupled services.

In order to compose workflows on the fly and to handle a large amount of concurrent workflow execution requests with a high quality of service, cost-efficient workflow optimization approaches have to be developed. Especially in the financial services industry, which exhibits a high percentage of batch processes, resilient performance is of great importance. Thus, we focus on the development and evaluation of algorithms and heuristics that ensure reliable workflow executions and avoid service level agreement (SLA) violations due to arising overload. The flexible integration of external services across organizational boundaries also requires dedicated mechanisms in order to ensure the security of the participating systems and exchanged messages. Achieving and guaranteeing dedicated security goals, such as confidentiality, authentication, authorization, non-repudiation, integrity, and availability, is mandatory. Thus, a further research focus is on SOA security challenges in the financial services industry.



## Recent Key Findings

Prof. Dr. Wolfgang König, Prof. Dr.-Ing. Ralf Steinmetz, Prof. Dr. Roman Beck

Layer 1 projects focus on creating, sourcing, and managing services and comprise the necessary alignment of financial business processes with IT resources. Our main results so far are based on extensive empirical research on outsourcing and IT value creation, as well as conceptual work and scientific simulation. The research results are documented in over 100 articles since 2003 at major international and national conferences as well as renowned scientific journals and important industry journals. Some recent key results of layer 1 are:

### ■ Business Services Based on Grid and Cloud Computing

Grid and Cloud computing have gained considerable attention in the financial services industry due to, e.g., its potential to significantly decrease the time-to-market of new financial products as well as to facilitate a more effective and efficient assessment and simulation of risk exposure and asset allocation. So far, much research has focused on the technical challenges that have to be overcome thereby fostering the widespread use of these technologies in the financial services industry. As a result of our collaborative research with several industry partners, we complemented prevalent technically-oriented research by providing an explanation of how Grid and Cloud computing can generate business value in the core business processes of financial services providers.

We conducted a multi-national, survey-based field study among financial services providers with more than 1,000 employees (U.S., Canada, U.K., Germany, Netherlands, and France) and gathered over 300 complete responses. The data was analyzed using structural equation modeling (SEM). Our results indicate that Grid and Cloud computing generate significant business value with regard to an increased effectiveness, efficiency, and flexibility of the analyzed asset management processes, new product development processes, and risk management processes. Among the key determinants that help firms to effectively assimilate Grid and Cloud technology is the capacity of the middle management as well as its close collaboration with the top management in order to ensure an improved business-IT alignment.

In addition, we analyzed a multi-participant case study to assess the current state of Cloud computing adaptation in the financial services industry, as well as to identify main inhibitors for the adaptation process. Our results indicate that Cloud computing and its underlying technologies, such as virtualization, gained a widespread use and are associated with multiple benefits. However, the results also show that the adaptation process, specifically with respect to public Clouds, is substantially inhibited by security and compliance concerns.

### ■ Service-Oriented Architectures

The financial services industry is characterized by rapid changes in business demands, both due to competitive pressures and regulatory requirements. In recent years, SOA has evolved as an important paradigm for the flexible and agile realization of business processes through IT systems.

Because an increasing number of finance-related IT services are provided by third parties, novel security challenges arise. In our research, we identified several, service-specific attack classes and proposed corresponding countermeasures. As one specific focus, we assessed the impact of anonymity systems – a typical countermeasure against eavesdropping attacks – on the quality of service of service provision through large-scale experiments.

In addition, our research focused on the quality of service-aware composition of internal and external services for the realization of business processes. In this context, a focus lies on the development of workflow management systems and optimization approaches that facilitate cost-efficient, cross-organizational process execution.

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## Layer 2

Layer 2 investigates the securities trading value chain and the dynamics in mediation relationships between market users, intermediaries and infrastructure providers in financial markets.

# E-Financial Markets & Market Infrastructures

Prof. Dr. Peter Gomber

The pace of innovation in financial markets has accelerated dramatically in recent years: New financial products have emerged and market infrastructures have changed significantly, both of which have been driven by information technology. IT is the lifeblood of today's globalized and networked financial markets.

These developments and new regulatory requirements have significantly affected the banking, brokerage and trading industry. Boundaries between the players have become blurred. Institutions attempt to diversify by moving up and down the securities trading value chain and thereby compete with incumbent players. Traditional investment banks find themselves competing with specialized new service providers in banking and brokerage, specifically concerning high frequency trading as well as related products and services. Electronic Financial Markets face dramatically accelerated numbers of transactions as their customers further automate their market processes and make use of intelligent order splitting and timing techniques that drive the reductions in average transaction sizes.

Furthermore, the financial crisis has created a new debate on the merits of centralized trading and clearing infrastructures to improve counterparty risk management and market integrity. This requires increased standardization which has to be balanced with the flexibility and innovation capacities of OTC markets. Regulatory initiatives that in the past pushed primarily for competition, efficiency and interoperability between infrastructure providers now have switched their focus on topics like market safety, integrity and stability, e.g. the European Market Infrastructure Regulation (EMIR).

Regulatory changes, a transformation of financial intermediation, and innovative brokerage concepts are the drivers that shape today's financial markets and market infrastructures. Therefore, these three aspects are subject to research and detailed analysis within this layer.

- The layer analyzes the impact of regulation on securities markets, such as the Markets in Financial Instruments Directive (MiFID) and its review, the Code of Conduct for Clearing and Settlement (CoC) or the EMIR. As we have seen in recent years, such regulation significantly affects securities markets and demands for suitable management approaches. The research in this layer, for example, addresses the effects of MiFID on the competitive landscape of execution venues in Europe, on order execution policies and on the balance between OTC trading and regulated venues. Other key aspects in this work stream are market safeguards and their implications as well as the massive change in the structure and operations of the European Post-Trading Industry where initiatives like Target2-Securities and the debate on OTC derivatives clearing are assessed from the perspective of market infrastructure providers and market users.
- A second focus is put on the transformation of financial intermediation that affects both, the parties involved in financial value chains and the capital market itself, including its microstructure. This work stream for instance explores the impact of automated trading strategies on the role of market intermediaries and their competitive relationships. Effects on capital markets are analyzed on the basis of empirical studies that for example address the influence of latency reductions in IT-supported securities trading.
- Additionally, the research activities aim at contributing to the design, development and evaluation of innovative brokerage concepts ranging from new technologies to novel financial concepts or products. Here, technical innovations include automation and standardization of central business processes or the application of novel approaches to support decision making in complex situations. Furthermore, we investigate innovative IT-based trading services such as "Algorithmic Trading" or "Smart Order Routing" that do not only lower transaction costs, but also enable market participants to cope with the fragmentation of liquidity.

# Recent Key Findings

Prof. Dr. Peter Gomber

The research results of layer 2 are published in major academic as well as industry journals and are presented at major international and national conferences. These are selected key results of layer 2:

## ■ Regulation of Securities Markets

The impact of MiFID on European securities markets and on investment firms was analyzed by six empirical studies. Two of them in 2008 and 2009 respectively examined best execution policies of German investment firms. The studies came to the conclusion that minimum legal requirements have recognizably been implemented in nearly all investigated policies. However, the usage of the policies as a competitive instrument cannot be recognized yet. In 2010 and 2011, the discussions on MiFID II were underlaid by two studies that measured the short and long-term impact of the new competitive landscape on market efficiency respectively. Competition between execution venues conclusively works in favor of investors and has led to the desired effects in terms of technology and trading model innovations, service competition, significant fee reductions and improved market quality in terms of reduced spreads and deeper order books. Liquidity has also been shown to recover within seconds after external shocks. Another empirical study reveals OTC activities in Europe to be very different from the original MiFID intention. Additional contributions were made by a systematic comparison of MiFID and its US counterpart RegNMS (Regulation National Market System) concerning transparency and best execution requirements. Several studies analyzed the evolution of the European Post-Trading industry and assessed the usage of management tools like the balanced scorecard by market infrastructure providers.

## ■ Transformation of Financial Intermediation

New technology-driven execution opportunities like High Frequency Trading, Algorithmic Trading and Smart Order Routing foster the transformation of intermediation relationships

and enable institutional investors to self-direct trading. Simultaneously, the complexity of institutional trading desks' tasks and technical infrastructure increases. As the management of this complexity requires a structured approach, we derived the concept of Order-Channel Management (OCM). OCM aims at supporting institutional investors by identifying suitable execution venues and strategies. Based on a quantitative study among the Top 500 asset managers in Europe, we identified the main drivers and inhibitors for the usage of new execution opportunities.

## ■ Innovative Brokerage Concepts

IT-driven brokerage innovations play an important role in a competitive landscape. Machine learning techniques that have been applied successfully in different problem domains represent a promising approach for novel brokerage concepts. In IT-supported decision-making, including decision support systems and Algorithmic Trading, the application of machine learning techniques is at an early stage. By applying state-of-the-art techniques such as Artificial Neural Networks or Support Vector Machines we illustrated how such technologies can be applied successfully to support or automate investment decisions. Furthermore, we propose a text mining approach that allows for the pre-interpretation of unstructured data according to pre-defined criteria, i.e. forecasting objectives. The proposed text mining approach might serve to support intraday risk management. Another subject is Algorithmic Trading behavior and its impact on market quality and market volatility. Based on a dataset that allows an identification of orders submitted by Algorithmic Trading engines, we investigated order placement strategies in comparison to human traders. It is shown that Algorithmic Trading engines fundamentally differ from human traders in their order submission, modification and deletion behavior as the former exploit real-time market data and latest market movements. We provide strong evidence that Algorithmic Trading does not increase volatility, at least not more than human traders do.

# People



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## Layer 3

Customers are the biggest asset of companies! The mission of Layer 3 is to show how financial service institutions can leverage the Internet to increase the value of and for its customers.

# Customers in E-Finance

Prof. Dr. Andreas Hackethal, Prof. Dr. Bernd Skiera

## Motivation

Research in layer 3 proceeds from the basic premise that the online environment will further gain in importance for financial service providers and that customer management in such an online environment poses substantial challenges. More and more banking and insurance managers need to deal with technologies that are related to social networks, smartphones, microblogging, wikis and avatars. Internet firms such as Google have achieved much higher stock market values than most financial service providers.

The aim of our work is to analyze these technological trends carefully and to evaluate how technology and business intelligence can create value for financial service providers and their customers. We posit that customers should be viewed as assets, which requires to evaluate their current and future values. The measurement of the value of a customer via a customer lifetime analysis and the value of the customer base via the determination of customer equity are particularly useful because they can also be linked to the financial value of a financial service provider. The value of technological trends for financial service providers is best evaluated by linking them to customer metrics, in particular customer profitability and loyalty measures such as customer lifetime, and analyzing how they can enhance the decision support and investor coaching by financial service providers. As improvements to customer decisions provide particular strong incentives for customers to stay with a financial service provider, we put substantial emphasis on analyzing factors that influence the quality of those decisions.

Module 1 focuses on investments in customers, in particular those that are related to the internet and (online) financial advice as well as decision support provided to the customers.

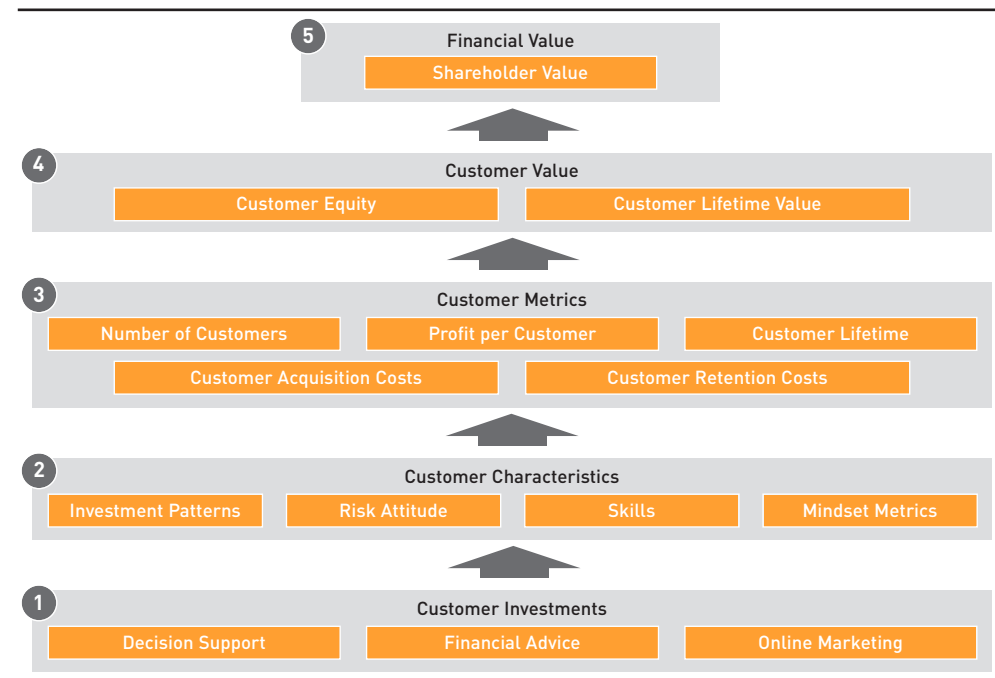
Module 2 concentrates on customer decision making and in particular on individual characteristics that influence customer preferences, beliefs and decisions.

Module 3 focuses on the five key customer metrics for financial service institutions. Multiplying the number of customers with the profit per customer leads to the current (short-term value of) profitability. The consideration of customer lifetime values allows for measuring the long-term values of customers. The two key investment measures are acquisition and retention (including

customer development) costs per customer. We develop models to appropriately measure those five customer metrics and analyze the interdependencies among those key metrics. We then identify the effects of investments in customer and customers' decision on those customer metrics.

Module 4 analyzes how to link customer metrics to customer value metrics, such as customer lifetime value or customer equity.

Module 5 links customer value to shareholder value as the key success metric of financial markets. In contrast to most discounted cash flow models, we use the five key customer metrics as the building blocks of our shareholder value model.



The figure above illustrates the framework for our research projects.



# Recent Key Findings

Prof. Dr. Andreas Hackethal, Prof. Dr. Bernd Skiera

## ■ Five key customer metrics

Our model of linking customer metrics to shareholder value indicates that financial service institutions should consider five customer metrics as key performance indicators for financial service providers and related firms, three on the revenue side: number of customers, profit per customer and retention rates, and two on the expenditure side: acquisition as well as retention expenditures (Schulze / Skiera / Wiesel 2012). Yet, not all of these metrics are continuously monitored by all financial service providers.

## ■ More emphasis on customer equity reporting

Customer Equity Reporting describes the value of a financial service institution's customer base. As such, it bridges the gap between financial statement capabilities and financial reporting objectives and aligns customer management with corporate goals and investors' perspectives (Wiesel / Skiera / Villanueva 2008). It also provides a mean improve the understanding of securitization activities of financial service institutions (Skiera / Bermes / Horn 2011).

## ■ Viral marketing campaigns work

Seeding strategies have a major influence on the success of viral marketing campaigns in social networks such as facebook. Our comparison of four different seeding strategies in two complementary small-scale field experiments and one real-life application shows that they work very well and that seeding strategies that target either well-connected individuals ("high degreeeness") or individuals who connect different parts of the network ("high betweenness") lead to a success rate twice as high as that of a random seeding strategy (Hinz / Skiera / Barrot / Becker 2011).

## ■ Proximity drives retail investor's trading

Information diffusion via social interaction plays a role for private investors' investment decisions. German retail investors who live in the same city hold similar stock portfolios. This effect is particularly strong for large domestic stocks. In line with an interpretation based on social contagion, locally correlated trading is increasing with the number of traders in a city but not with a measure of local news. Also, locally correlated trading is particularly strong for investor age groups with strong local social ties but weak for age groups with the strongest exposure to local news (Schmittmann / Meyer 2011).

## ■ Investors don't learn from their mistakes

We hypothesize that experience translates into higher investment returns by learning from investment mistakes. To test our hypotheses, we use an administrative dataset which covers the trading history of nearly 20,000 individual investors. Results show that underdiversification and the disposition effect do not decline as investors gain experience. However, we find that experience correlates with less portfolio turnover, suggesting that investors learn from overconfidence. Hence, it seems relatively easy for individuals to identify and avoid costs related to excessive trading activity (Köstner / Meyer / Hackethal 2011).

## ■ How to enhance customer benefits through online advisory tools

We analyze how online investors adopt a new and unbiased portfolio optimization tool and find that only a very few investors implement the recommendations from the tool although most other investors would also benefited substantially. We conclude that transparency with respect to risk and return profiles of individual portfolios would help providers producing customer benefits (Bhattacharya / Hackethal / Kaesler / Loos / Meyer 2011).

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Dissertation Thesis: "Pricing Mechanisms in Grid Computing"
- **Timo Litty**  
Dissertation Thesis: "How do retail customers manage financial and liquidity risk?"

## CHAIR OF ELECTRONIC COMMERCE, GOETHE UNIVERSITY FRANKFURT:

- **Lisa Schöler**  
Dissertation Thesis: "New Products and Technology for Customers in E-Finance"

## COOPERATIVE PH.D. PROGRAM:

- **Christian Schmitz**, Accenture  
Dissertation Thesis: "The impact of social media on stock market outcomes"
- **Tobias Velensek**, Accenture  
Dissertation Thesis: "Risk Management for Private Investors"



# Research Processes and Interaction Channels

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## Cooperative Ph.D. Program

One of the major platforms for a steady and mutual knowledge transfer between the E-Finance Lab and the sponsoring firms is our cooperative Ph.D. Program.

This program targets excellent staff members of the sponsoring firms working in one of the fields of the E-Finance Lab layers, who are interested in deepening their methodological knowledge and make it better applicable in their everyday business. As part of the program they can participate in the Lab's research projects developing their Ph.D. theses when they fulfill the necessary prerequisites. Being integrated in the research community of the respective layers and the E-Finance Lab, they learn scientific methods from empirical research to simulation model design in a methodology course program and agree to apply the methods in their research.

At the same time, the participants of the Ph.D. program are an important gateway between the E-Finance Lab and the sponsors, disseminating the research results into the firms' business and bringing back relevant business problems, (anonymized) data, and experiences into the Lab.

Besides these two functions, the cooperative Ph.D. program enhances the multidisciplinary of our research and provides us with business insights not easily available to others. Also, the possibility to use the business contacts of the cooperative Ph.D. students shortens the way to interview partners and thereby fosters empirical research. The same holds vice versa when it is much easier for the firms to find adequate experts within the scientific community. At the same time, this contributes to ensuring the business relevance of the research questions and ultimately our entire research effort.

While the dual challenge of working at a firm and researching at the Lab is certainly highly demanding, the results of this program are uniquely favorable, individually as well as for the E-Finance Lab partner organizations and for the science community. For example, Dr. Cornelia Gellings, Dr. Heiko Gewalt, and Prof. Dr. Heinz-Theo Wagner earned their doctoral degrees with outstanding success (see page 31 – "Selected Alumni of the E-Finance Lab"). All in all, the cooperative Ph.D. candidates provide a significant contribution to the generation of high-quality research papers.

As of January 2012, participants of the cooperative Ph.D. program of the E-Finance Lab are:

- **Layer 1** Sabine Fremdt, IBM  
Christoph Seebach, IBM  
Olga Wenge, Deutsche Bank  
Frank Zickert, Deutsche Bank
- **Layer 2** Bernd Mack, Deutsche Börse  
Gregor Pujol, IBM  
Uwe Schweickert, Deutsche Börse
- **Layer 3** Christian Schmitz, Accenture  
Tobias Velensek, Accenture

## Selected International Research Cooperations



Prof. Mark Keil, Ph.D.



Prof. Arun Rai, Ph.D.



Prof. Michael Aitken, Ph.D.



Dr. Andreas Furche

Together with Prof. Mark Keil, the research team of layer 1 works on IT project risk management and cross-cultural issues in globally dispersed project teams. Prof. Keil and his team at Georgia State University have an outstanding publication record in that research area. First results of the joint research have already been published and further journal publications will follow. Also at Georgia State University, Prof. Arun Rai collaborates with the researchers of layer 1 in a research project on organizational learning, knowledge management and social network analysis in the context of Web 2.0 applications. Prof. Keil and Prof. Rai also support our E-Finance Lab Ph.D. program and contributed to our Philosophy of Science in IS summer colloquium throughout the years 2007 to 2009. The IS faculty at Georgia State is the most prestigious IS research unit in the US in terms of the number of successful publications in high-quality journals such as ISR or MISQ.

In cooperation with Prof. Michael Aitken and Dr. Andreas Furche, Capital Markets Cooperative Research Centre (CMCRC) Sydney, layer 2 investigates the new European equity trading landscape. Prof. Aitken, Chief Scientist at the CMCRC, is widely regarded as the most industry-centric academic associated with international capital markets. His research is focused on security market design with a particular interest in market integrity assessment and the design of information systems for real-time fraud detection (e.g. insider trading, market manipulation and front-running). Dr. Furche is CEO of SMARTS Group (a NASDAQ OMX Company) and a Director of the CMCRC. SMARTS Group is the world's leading supplier of securities markets surveillance technology. The Capital Markets Cooperative Research Centre was formed in 2001 to bring together the best in innovative research and technology to the capital markets domain. Its research attracts the best of Australia's researchers and involves 23 domestic and international partners including four Sydney based universities. Altogether the CMCRC possesses research resources of approximately 40 senior researchers from the fields of finance and technology and a similar quantum of human resources by industry partners.

# Knowledge Transfer

As an industry-academic partnership, the E-Finance Lab particularly emphasizes the dissemination of research results into both the scientific and business communities over a variety of knowledge transfer channels.

Publications are the “currency” of researchers. To sustainably influence the debates we target publishing our papers in renowned double-blind peer-reviewed journals and top conferences. All publications of the E-Finance Lab are available from its home page at [www.efinancelab.com](http://www.efinancelab.com) →publications.



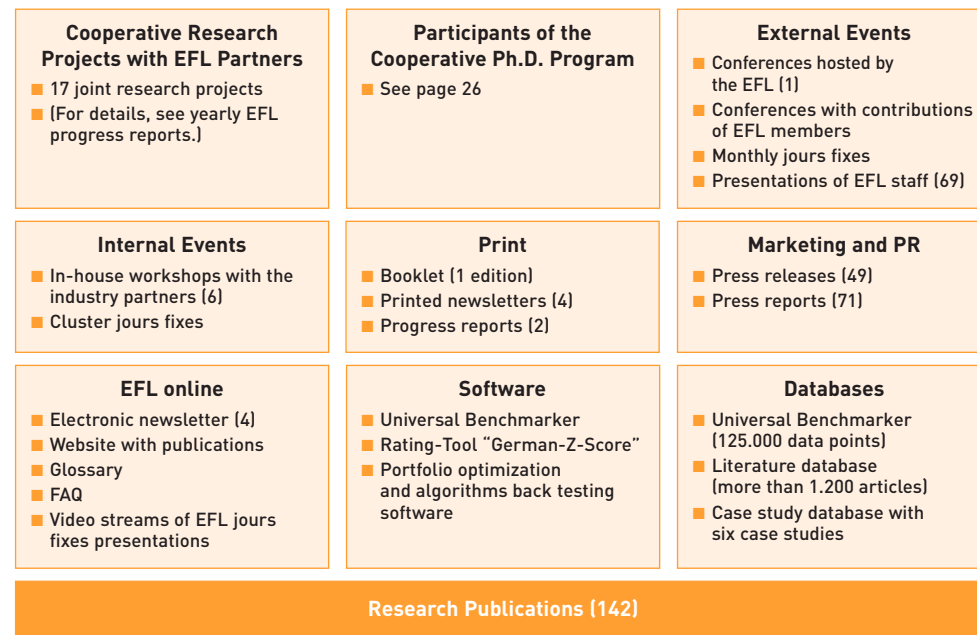
In addition, we regularly run E-Finance Lab **conferences** on particular research topics. Internationally renowned speakers as well as E-Finance Lab researchers present facts, research results, and visions from an academic and business perspective to several hundred participants.

Two quarterly **newsletters** report on ongoing works and outcomes. A printed newsletter focuses on the results of research projects while a digital newsletter is made-up of teasers and hyperlinks to internet resources and news. Subscription to the newsletters is available on our home page ([www.efinancelab.com](http://www.efinancelab.com)) on the bottom.

Regularly, at the first Monday of each month at 5 pm, in the **E-Finance Lab Jour Fixe** our researchers as well as renowned speakers from practice and academia present novel ideas and concepts. These events are open to the public. For details on topics, speakers, time, and location please refer to our home page. These presentations may also be accessed as video streams via our homepage.

Another approach to offer the research results to the public is implementing findings and methods in **software** and making them available via the web. An example is the earlier described E-Finance Lab Benchmarker which contains data from several empirical studies. Entering one’s own data results in an on the fly analysis and automatic benchmark.

In addition, we continuously expand our empirical **databases**. Besides this, regular **individual workshops, topical meetings**, and internal conferences between the researchers and sponsors establish a sustainable bilateral knowledge transfer.



Channels for knowledge transfer into practice (the numbers refer to the year 2011).

## Membership at the House of Finance



The E-Finance Lab is a proud member of the House of Finance. The House of Finance opened in spring 2008 and amalgamates the university's interdisciplinary research on finance, monetary economics, and corporate and financial law under one umbrella.

In addition to these three academic research departments, seven institutes have moved to the House of Finance – the E-Finance Lab is the largest research institute. This scientific community aims at establishing it as one of the leading European centers for research and education in the

field of finance and to form an important hub within an international network. The set-up of the House of Finance combines lean organization with productive energy and diversity providing an inspiring intellectual environment. The major tasks will be to integrate various disciplines, to integrate theory and practical work, to integrate research and teaching, and to find answers to the burning questions of the future of the financial service industry.

For further information on the House of Finance please visit the website: [www.hof.uni-frankfurt.de](http://www.hof.uni-frankfurt.de)

## Examples of Recent E-Finance Lab Publications

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- (Some publications may be directly downloaded from our web site [www.efinancelab.com](http://www.efinancelab.com). Otherwise, we have forfeited the copyright to the journal or conference owners. Upon request we are happy to send copies. Please direct inquiries to the authors.)



## Selected Alumni of the E-Finance Lab

- **Dr.-Ing. Rainer Berbner**  
Senior Consultant, Deutsche Telekom AG, Bonn, Germany
- **Dr. Sven Christian Berger**  
Referent, Federal Financial Supervisory Authority (BaFin), Bonn, Germany
- **Dr. Manuel Bermes**  
Referent, Capital Markets Policy, Deutsche Bank AG, Frankfurt am Main, Germany
- **Dr. Ralph Bluthgen**  
Assistant to the Director, AXA S.A., Cologne, Germany
- **Assistant Prof. Dr. Martin Böhm**  
Assistant Professor, Instituto de Empresa Business, School Marketing Faculty, Madrid, Spain
- **Dr. Oliver Bosch**  
Associate, Global Banking – Mergers & Acquisitions, Deutsche Bank AG, Frankfurt am Main, Germany
- **Dr.-Ing. Julian Eckert**  
Business Consultant, Merck KGaA, Darmstadt, Germany
- **Dr. Lars Friedrich**  
Director, Commerzbank AG, Frankfurt am Main, Germany
- **Dr. Tanja Frischmann**  
Senior Consultant, Cocomore AG, Frankfurt am Main, Germany
- **Dr. Cornelia Gellings**  
Project Manager Strategic Management Services, Deutsche Bank AG, Frankfurt am Main, Germany
- **Dr. Tom Gellrich**  
Head of Target Operating Model – Finance, Commerzbank AG, Frankfurt am Main, Germany
- **Assistant Prof. Dr. Sonja Gensler**  
Assistant Prof., Faculty of Economics and Business Administration, Department of Marketing, Rijksuniversiteit Groningen, The Netherlands
- **Dr. Heiko Gewalt**  
Senior Manager, Oliver Wyman Ltd., London, United Kingdom
- **Dr. Markus Gsell**  
Business Analyst, Deutsche Börse AG, Frankfurt am Main, Germany
- **Prof. Dr. André Güttler**  
Heisenberg fellow, European Business School (EBS), International University Schloss Reichartshausen, Oestrich-Winkel, Germany
- **Dr.-Ing. Oliver Heckmann**  
Tech Lead Manager, Google Labs Zürich, Zürich, Switzerland
- **Dr. Daniel Hinz**  
Associate Principal, Business Technology Office, McKinsey & Company, Frankfurt am Main, Germany
- **Dr.-Ing. André Miede**  
Senior Consultant, BearingPoint GmbH, Hamburg, Germany
- **Prof. Dr. Jan Muntermann**  
Chair of Electronic Finance and Digital Markets, Georg-August-Universität Göttingen, Germany
- **Dr. Donovan Pfaff**  
CEO, Bonpago GmbH, Schwalbach / Taunus, Germany
- **Dr. Torsten Schaper**  
Assistant Vice President, Deutsche Börse AG, Frankfurt am Main, Germany
- **Prof. Dr. Heinz-Theo Wagner**  
Chair for Management and Innovation, German Graduate School of Management and Law, Heilbronn, Germany
- **Prof. Dr. Tim Weitzel**  
Chair for Information Systems and Services, University of Bamberg, Germany
- **Assistant Prof. Dr. Thorsten Wiesel**  
Assistant Prof., Faculty of Economics and Business Administration, Department of Marketing, Rijksuniversiteit Groningen, The Netherlands





## Sponsors

A cluster of excellence comprises highly educated and experienced practitioners as well as top scientists. Thus, both science and practice benefit by joining these forces. We exercise great efforts in integrating practitioners into our research.

# Deutsche Bank



**Deutsche Bank**



**ROLF RIEMENSCHNITTER**  
Chief Technology Officer (CTO)

Board Member, E-Finance Lab

As a "Tier-1 Partner", Deutsche Bank supports the E-Finance Lab's unique approach of combining scientific research with the practical experience of various industry partners to develop solutions addressing today's challenges in the finance industry.

Deutsche Bank is a leading global investment bank with a strong and profitable private clients franchise. A leader in Germany and Europe, the bank is continuously growing in North America, Asia and key emerging markets. With roughly 100,000 employees in 73 countries Deutsche Bank offers unparalleled financial services throughout the world. The bank competes to be the leading global provider of financial solutions for demanding clients creating exceptional value for its shareholders and people.

Financial solutions are technically enabled and supported by Deutsche Bank's IT and Operations network:

- Global Technology provides all IT services and solutions for the Bank, including building and delivering the applications to enable the Bank to succeed and grow being responsible for the deployment, running and production control of the systems.
- Global Business Operations ensures that transactions across the globe are processed efficiently.

Changing market conditions and new developments within the banking and IT industries as well as demanding clients are driving the need for further research in IT's role within a banking organization. Until now, academic research has not yet strongly focused on the analysis of IT-related aspects within the financial services industry, for example:

- the handling of dramatic growth in transaction volumes,
- ensuring the scalability and resilience of IT systems,
- analyzing different sourcing opportunities,
- transforming fixed into variable costs, and
- improving quantitative know-how regarding operational risk.

Therefore, Deutsche Bank supports the E-Finance Lab and its objectives: to gain a deeper understanding of these issues and to evaluate different alternative courses of action.

# Deutsche Börse



**RAINER RIESS**  
Managing Director

Board Member, E-Finance Lab

Securities markets are becoming increasingly networked and competition even more global: Issuers want to tap international markets when raising equity capital; while investors have long since ceased to stop at national borders when seeking new opportunities; traders and intermediaries expect integrated trading, clearing and settlement platforms that they can access at any time, from any place, and always for the same high quality conditions.

Over the last decade, Deutsche Börse Group has emerged as a leading international provider of transaction services across asset classes. We provide access to liquid marketplaces of highest efficiency and integrity with advanced technology for customers worldwide.

Understanding the securities trading value chain with its drivers of change and their implications is essential to improve our value proposition. The industry-academic approach of the E-Finance Lab deepens that understanding in order to develop markets for the benefit of issuers, investors and intermediaries. We support the E-Finance Lab with our commitment and partnership.

## About Deutsche Börse

Being the only fully integrated exchange organization worldwide, Deutsche Börse's product and service portfolio covers the entire process chain in securities and derivatives markets:

- Deutsche Börse operates one of the largest fully electronic cash markets in the world with the Xetra trading platform and the Frankfurt Stock Exchange.
- Eurex is the largest transatlantic derivatives marketplace and a global market leader in the trading and clearing of futures & options.
- Eurex Clearing is our European clearinghouse and serves as Central Counterparty for derivatives, equity, fixed income and money market transactions.
- Clearstream, a subsidiary of Deutsche Börse, provides banking, custody and settlement services in fixed income securities and equities.
- We channel the information flows of markets through Market Data & Analytics such as prices, indices and company-related data that are tailored to individual needs.
- Deutsche Börse operates exchanges around the world and supplies the technology for international service providers.

Deutsche Börse was the first major exchange to go public in February 2001, became a member of the German blue chip index DAX in December 2002 and the European blue chip index Euro STOXX 50 in October 2007. We serve customers globally with 3,000 employees out of 10 locations in Europe and 7 in Asia / USA including representative offices in London, Paris, Moscow, Chicago, New York, Hong Kong, Tokyo, Peking, Singapore and Dubai.

## DZ BANK Gruppe



### DZ BANK Gruppe

**ULRICH KÖHNE**

**Chief Financial Officer and Chief Operating Officer  
Union Asset Management Holding**

Board Member, E-Finance Lab

As partners and product suppliers to the banks in the cooperative banking sector, the companies in the DZ BANK Group are obliged to develop and offer a competitive product choice and appropriate services, which enable the local cooperative banks to successfully provide convincing Allfinanz services to their clients. The "Volksbanken Raiffeisenbanken" have achieved a level of expertise in this respect that impresses also DZ BANK's institutional and corporate direct clients. The extensive placing power through the local cooperative banks is important for these clients. Seamless integration of business processes extending from the product suppliers to the sales operation in the cooperative banks need to be designed on a group-wide basis. In addition, horizontal coordination between product suppliers is required in order to be able to create solution packages for clients using financial products that complement each other perfectly.

Building on the independence of the market participants, a professional project management in place for planning, timely decision-making, and monitoring is vital. Convergence paths have to be identified and turned into sound technical solutions for tightly integrated processes. Cooperation and networking is of crucial importance in the subsidiary structure of the cooperative financial services network. Extensive collaboration of our companies with the cooperative data centers results in shared IT applications which form part of what may possibly be the largest shared IT landscape in Germany.

We see the E-Finance Lab as a platform for joint discussions regarding group-wide services and the cooperation required. New opportunities for the financial services sector could be inspired and their distribution facilitated.

#### **About the DZ BANK Group**

The DZ BANK Group is part of the German cooperative financial services network, which comprises around 1,130 local cooperative banks and is one of Germany's biggest private-sector financial services organisations measured by consolidated assets. Within the cooperative financial services network, DZ BANK AG functions as a central institution for more than 930 local cooperative banks with 12,000 branches and also as a corporate bank with an increasingly international but primarily European focus.

The DZ BANK Group includes Bausparkasse Schwäbisch Hall – a building society, DG HYP (Deutsche Genossenschafts-Hypothekenbank) – a mortgage bank, DZ PRIVATBANK, R+V Versicherung – an insurance company, TeamBank – consumer finance, Union Investment Group – asset management, VR LEASING and a range of other specialised service providers. With their strong brands, the companies of the DZ BANK Group are central pillars of the cooperative banking group's Allfinanz offering. Cooperation between the DZ BANK Group companies makes it possible to optimise the network's market offerings for the benefit of the local cooperative banks and their approximately 30 million customers.

This combination of banking, insurance and asset management services has a long and successful tradition in the cooperative financial services network. All the DZ BANK Group's specialised service providers offer first-class and highly competitive products in their respective fields of expertise at reasonable prices. They help equip Germany's local cooperative banks to offer their customers the complete spectrum of first-rate financial services.

## Finanz Informatik



**MARTIN WALDMANN**

Head of Executive Staff,  
Chief Representative / General Representative

Board Member, E-Finance Lab

To Finanz Informatik, the E-Finance Lab is an outstanding combination of scientific expertise and highly specialized know-how of leading enterprises on the market. It offers a sound platform for exchange among the various sectors involved in the industrialization of banking. As a tier-1 partner, Finanz Informatik is contributing with its specialist knowledge of the Savings Bank environment and utilizes the research findings.

Finanz Informatik, with its head office in Frankfurt am Main, is the IT service provider for the German Savings Bank Association. The company serves the German savings banks (428 institutes). These banks have an accumulated balance sheet of 1,078 billion euro and have 248,137 employees. Other important customers of Finanz Informatik are companies such as Landesbanken (central banks for the savings banks and state banks), Landesbausparkassen (building and loan societies), insurance companies and other companies within the Savings Bank Association and the financial service sector. Finanz Informatik is responsible for conducting services for 129,6 million accounts; each year, billion technical transactions are being processed by the company's systems. Finanz Informatik itself has 5,171 employees and has a revenue of 1,466.3 million euro (in 2010).

The company offers the full scope of IT services – from development and implementation of IT applications, networks and technical infrastructure to data processing centers or consulting, training and support. Finanz Informatik offers OSPlus for the German retail banking sector; a comprehensive, unified system that is characterized by flexibility and openness. The company plays an important part in the ATM association of the European Savings Banks Organization EUFISERV that spans more than 75,000 savings bank ATMs in 12 countries.

Thus, Finanz Informatik offers a broad scope of potential areas on which knowledge can be exchanged in the E-Finance Lab.

# IBM



**ULRICH WOLF**  
Managing Director

Board Member, E-Finance Lab

IBM is a tier-1 partner in the E-Finance Lab, bringing a global perspective and unique practical experience to this industry-academic partnership.

With more than 400,000 employees active in over 170 countries IBM is one of the world's largest providers of information technology and industry solutions. IBM's portfolio of solutions ranges from hardware and technologies to software and services, including consulting and business services, IT and process services, as well as outsourcing and financing services. Founded more than 100 years ago, IBM has regularly redefined itself and has become one of the world's strongest brands based on the innovations that extend way beyond base technologies, with investments up to \$6 billion a year in research and development.

IBM in Germany has its headquarters in Ehningen near Stuttgart and is covering all competencies of the organisational value chain including 'Research & Development', 'Sales & Consulting', 'Solutions & Services' and 'Management & Support'. IBM in Germany has locations in all major cities and the respective teams are organised along major industries and markets.

The banking industry, a virtual backbone for all other industries, feels the pressure of globalization and the increasing changes of the economical and regulatory market environment. This drives the rising need for increased collaboration within value chains both within the banking industry and with the industries it serves. Collaboration demands technology integration in order to reduce redundancy, inflexibility and inefficiency in all major banking processes.

IBM supports the financial services industry clients with account teams that are focused on client value bringing together both industry and solutions expertise. Customers benefit from specialized teams with comprehensive industry know-how and from the end-to-end solution expertise that IBM can provide.

IBM actively supports the E-Finance Lab's research into the changing role of IT in the financial services industry and we anticipate that this work will continue to deliver valuable insights.



# T-Systems



• • **T** • • Systems •

**ANSGAR STEDEN**  
Vicepresident Sales Unit Finance

Board Member, E-Finance Lab

Reflecting increasing market pressure, the finance industry actually undergoes a tremendous change in its business architecture. Banks specialize as sales, transaction and product banks and third party vendors are employed to improve the cost-income ratio. Industrialization of the Financial Services Industry is based on automation and standardization of the business processes within the banks, between the banks and between the banks and their customers. The cross-company financial value chain will be reorganized as a network of specialized companies connected by automated processes. The members of the network specialize in their most competitive processes and outsource the others.

After the “e-business hype” and the “crisis” of the investment banking, retail banking and its industrialization gains new importance for the banking industry. In the same time, the process of industrialization of the finance industry creates new retail banking capacities. This is one reason that overcapacity of retail banking is an important issue for the community.

Strengthening the sales forces is a matter of survival for retail banks. Important challenges are:

- fast development of new products and innovative services,
- availability of the financial services anywhere and anytime,
- reducing process costs to the customer equity by integrating the different channels and automation of their processes.

Optimized automated processes require appropriate IT and Telecommunication (ICT) systems both within companies as well as in interorganizational networks. Telecommunication systems increasingly avail themselves from the tremendous advances in information and communication technologies thus enabling Unified Communication. These technologies generate the requirements of a pertinent integrated management of information processing and communication systems – overcoming the unefficient traditional division of “both worlds”.

Besides the vertical break-down of the financial value chain in specialized banks, a horizontal specialization in IT or ICT process competence takes place. Drawing on a global infrastructure of data centers and networks, T-Systems has specialized in ICT processes to support the financial business processes. T-Systems provides integrated solutions for the networked future of business and society. The company’s some 47,600 employees combine industry expertise and ICT innovations to add significant value to customers’ core business all over the world.

In this arena, the E-Finance Lab with its multi-layered science and business partnership is a both challenging and promising endeavor. As a tier-1 member, we are particularly engaged in layer 3 “Customers in E-Finance” and in layer 1 “IT Infrastructure: Service Systems in E-Finance”. We expect from our engagement applicable results, which help us to remain highly competitive in the future reorganized network of the financial value chain.

## 360 Treasury Systems AG (360T)



**CARLO KÖLZER**  
Member of the Executive Board

Board Member, E-Finance Lab

360T is the leading provider of high-end trading technology in Europe and among the five biggest platforms for over-the-counter (OTC) financial instruments globally. Its in-house developed trading solutions increase process transparency and efficiency for globally operating organisations like corporate treasuries, bank dealing desks and institutional clients. Counted among the company's client base are major household names from Europe's top leading companies trading, in turn, with over 100 banking partners.

360T's multi-bank platform TEX® offers clients the ability to trade across a wide product range, including Foreign Exchange products, Money Market loans and deposits, FX / Interest Rate Derivative products, NDFs, Money Market Funds and Precious Metals. Furthermore, the company offers a professional intra-group / white label trading technology which enables organisations to provide internal electronic trading services on a proprietary branded platform in a completely flexible and scalable way.

Founded in 2000, 360T's successful growth has been based on providing solutions to meet the needs of treasury and trading. The FX market remains one of the largest and yet fastest growing markets worldwide. Technology service providers and trading platforms are often at the forefront of this development. Headquartered in Frankfurt am Main, Germany, 360T maintains a worldwide

presence with local representation in all major countries and with key office centres in New York (360 Trading Networks Inc), Singapore (360T Asia Pacific Pte. Ltd.) and Dubai (360 Trading Networks LLC) and Mumbai.

### Credentials and Trust

Reliability and confidence in a service partner is paramount in a business environment where milli-seconds matter and the exchange of data is of the most importance. 360T, its management and its employees, work hard to earn and receive this trust. 360T is licensed and regulated by the German Federal Financial Supervisory Authority (BaFin). The company is privately owned and operates on a bank-independent basis. 360T owns and develops its own technology. This gives 360T the trust and credit of all partners and clients on both sides of the market and the ability to offer objective advice, support and the technology solution which best meet our clients' respective trading needs.

Over the years, the company has established an outstanding reputation based on quality and its brand, thereby winning some of the most demanding clients in the capital markets. Among 360T's clients are a fast growing number of Europe's top listed companies, including many in the DAX, FTSE, DOW, etc., government organisations, institutional clients (asset managers, hedge funds, commodity trading advisors), broker dealers and banks.

Each day more than 1,000 of the world's largest organisations and financial institutions trade billions over the TEX® platform.

E-Finance Lab's aim is to carry out and provide high-quality research relating to the financial services industry, challenging with new ideas and providing a forum for discussion. 360T is proud to support this initiative, to share and to contribute our know-how and specific experience to and within E-Finance Lab.

## Interactive Data Managed Solutions



### Interactive Data

**STEPHAN WOLF**

**Member of the Executive Board - IT and Operations**

**Chief Technology Officer**

**Interactive Data Managed Solutions**

Board Member, E-Finance Lab

E-Finance Lab combines scientific expertise and the practical experience of market leading companies to the benefit of the financial services industry. New research insights and concepts for deploying industrial process methods to the financial sector spark innovation in our industry and help solve the challenges ahead.

The E-Finance Lab endeavour is an inspiration for Interactive Data's product and process design departments and thus helps us to serve our customers even better. In return, we can provide practical experience to the university, for instance by helping research assistants to better pinpoint high-quality research questions and to decide how to tackle them appropriately.

#### **About Interactive Data Corporation**

Interactive Data Corporation is a trusted leader in financial information. Thousands of financial institutions and active traders, as well as hundreds of software and service providers, subscribe to our fixed income evaluations, reference data, real-time market data, trading infrastructure services, fixed income analytics, desktop solutions and web-based solutions. Interactive Data's offerings support clients around the world with mission-critical functions, including portfolio valuation, regulatory compliance, risk management, electronic trading and wealth management. Interactive Data is headquartered in Bedford, Massachusetts and has over 2,500 employees in offices worldwide.

One of Interactive Data's services is to aggregate data from a broad range of information providers, as well as client-proprietary content, and integrate it into customized and fully-hosted web-based portal and terminal solutions. These managed solutions, now used by more than 600 organizations around the world, can provide clients and their employees with relevant information and tailored functionality in easy-to-use interfaces.

Through its offerings, Interactive Data employs innovative technology designed to help clients realize greater value from their financial market data. Instead of just displaying real-time, end-of-day and delayed data, Interactive Data can deliver the information in applications for easy comparison and appraisal in individual contexts. In addition, decision support tools and analytics, extensive charting capabilities and sophisticated search functions are designed to help facilitate the investment and advisory processes.



## Participating Universities



## Frankfurt University



**PROF. DR. WERNER MÜLLER-ESTERL**  
President

Board Member, E-Finance Lab

Goethe University is Hesse's largest and most distinguished university and the scientific center of the Rhine-Main region. With its cosmopolitan and international atmosphere in one of Germany's most interesting and exciting cities, the university offers, both scientists and students alike, a stimulating and attractive environment for teaching, research, studies and living. The variety of academic fields offers excellent opportunities for gaining interdisciplinary experience.

As of 2008, Goethe University has been transformed into an endowed institution under public law with a nationwide unique measure of autonomy. Having been founded in 1914 by the citizens of Frankfurt, it is thus tying up to its unique tradition as Germany's first endowed university which attracted excellent scholars such as Paul Ehrlich, Max Dehn, Max von Laue, Otto Stern, Hugo Sinzheimer, Martin Buber, Walter Benjamin, and Erich Fromm.

At the same time, Goethe University is undergoing an enormous architectural reconstruction by concentrating the sciences on the Riedberg Campus at the outskirts of Frankfurt and the humanities on the Westend Campus. This campus with the unique Poelzig building is the new focal point of the university in downtown Frankfurt. Within the next years, this process of concentration will be completed, transforming the university into one of the most modern in Europe.

Frankfurt University is sharpening its profile by intensifying connections to institutions and corporations in the finance industry in the region which become manifest in quite a number of endowed professorships and guest speakers. The "Institute for Law and Finance" (ILF) and the "Center for Financial Studies" (CfS) are two examples of research, post-graduate education and know-how transfer. The finance-related competences of the university are concentrated in the "House of Finance" on the Westend Campus – including the E-Finance Lab. We are very proud to have these distinguished industry partners supporting our work.

The E-Finance Lab is, in addition to other initiatives, an excellent example of the equally interdisciplinary and application-oriented research that characterizes the Department of Economics and Business Administration at Frankfurt University. The dedication of professor Peter Gomber, Andreas Hackethal, Wolfgang König, and Bernd Skiera underlines the need to combine finance business and science for the sake of the international competitiveness of the city of Frankfurt and the Rhine-Main region.

# Technische Universität Darmstadt



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

**PROF. DR.-ING. HOLGER HANSELKA**  
Vice president

Board Member, E-Finance Lab

Technische Universität Darmstadt (TU Darmstadt) is one of the leading German universities in research and teaching with a strong focus on technology. It also has a higher degree of independence and autonomy compared to other German state universities. This new model university, which was granted far-reaching autonomy by state law on January 1<sup>st</sup> 2005, sees in this status a commitment to maintaining its position as one of the top Technical Universities in Germany and to leading the way internationally in such crucial future-oriented fields as engineering, energy, mobility, information and communication, construction and habitation.

Scientists cooperate in thirteen departments and three additional interdisciplinary centres of research excellence on significant future-oriented topics. In this context electronic technologies such as e-Finance play an important role in the TU Darmstadt research and innovation roadmap. TU Darmstadt's research and innovation profile is also attractive to industry: Major international corporations such as Deutsche Bahn, Lufthansa, Merck, Rolls Royce, Wella or dynamic regional enterprises such as Schenck Process are among TU Darmstadt's selected cooperation partners.

By TU Darmstadt state law, TU Darmstadt commits itself to giving all of its students intensive advice, and to providing high-quality conditions to enable them to complete their scientific degrees

in reasonable time. The changeover to bachelor's and master's programs has been completed, and scientific degrees awarded are recognised by other excellent universities and institutes of technology in Germany and abroad. Study programs combining technical and business studies, supplemented by foreign languages and study periods abroad, provide excellent opportunities for our graduates. Furthermore a characteristic feature of TU Darmstadt is its research-oriented study program approach. The philosophy of "studying through research" is the well-established secret of TU Darmstadt's success.

## International Identity

Ever since it was founded in 1877, TU Darmstadt has been an internationally oriented university. With an international students' body of about 18.5 %, TU Darmstadt greatly exceeds the average of 9 % among German universities. TU Darmstadt maintains cooperation agreements with more than 100 partner universities worldwide, including universities of international repute such as Virginia Tech, Berkeley, Imperial College London, Tongji University, Ecole Centrale de Paris or Chalmers University Göteborg. TU Darmstadt is open to students from all over the world. On the campus, the international meeting place "ComeTUgether" is the central information centre for all international students. A variety of programmes and service facilities ("TU Experience", accommodation service, mentoring, the buddy programme etc.) help to ensure that students complete their studies satisfactorily and successfully.

In Greater Darmstadt outstanding independent research institutions such as Fraunhofer Institutes have collaborated closely with TU Darmstadt for many years. The heads of the three local Fraunhofer Institutes are simultaneously professors at TU Darmstadt. We have excellent contacts to ESOC, the satellite control centre of the European Space Agency ESA, EUMETSAT and GSI Helmholtzzentrum für Schwerionenforschung. In addition, the arts flourish in Darmstadt: the Mathildenhöhe, Darmstadt's major Art Nouveau centre, attracts thousands of art devotees every year.

For further  
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The E-Finance Lab is a proud member of the House of Finance of Goethe University.  
For more information about the House of Finance, please visit [www.hof.uni-frankfurt.de](http://www.hof.uni-frankfurt.de).