University of Augsburg
Prof. Dr. Hans Ulrich Buhl
Research Center
Finance & Information Management
Department of Information Systems
Engineering & Financial Management

Universität Augsburg
University

Discussion Paper WI-172

Competition of Retail Trading Venues –Onlinebrokerage and Security Markets in Germany

by

Dennis Kundisch, Carsten Holtmann[1]

April 2006

erscheint in: Schlottmann, F., Seese, D., Weinhardt, C., Handbook on Information Technology in Finance, Springer, Berlin, 2006

[1] Forschungszentrum Informatik (FZI), Karlsruhe

Competition of Retail Trading Venues – Online-brokerage and Security Markets in Germany

Dr. Dennis Kundisch[*] and Dr. Carsten Holtmann[+]

[*] Department of Information Systems & Financial Engineering,
Competence Center IT & Financial Services, University of Augsburg, Germany,
email: dennis.kundisch@wiwi.uni-augsburg.de

[+] Research Unit Information Process Engineering (IPE), FZI Forschungszentrum Informatik, Karlsruhe, Germany,
email: holtmann@fzi.de

Summary: Germany is one of the few countries with a vivid regional stock market structure. Some of the markets specifically address the retail investor with their offerings and compete on price as well as on quality. Retail investors cannot access these markets directly, but have to make use of intermediaries such as an online-broker. The explicit transaction costs are one important factor that influences the decision of a retail investor whether and where to perform a transaction. In this contribution on the one hand the services that are affiliated with a stock market transaction and on the other hand pricing schemes of four online-brokers are analyzed. The research question addressed is, whether a potentially present price competition of the stock markets and other affiliated service providers is visible for the retail investor. Due to the pricing scheme of the online-brokers which are primarily relevant for the retail investor, potentially existing price competition on the level of the stock markets mostly does not become visible. However, differences can be reported in the distortions caused by the different pricing schemes of the analyzed online-brokers.

Annotation: This contribution is an extended and revised version of the contribution: D. Kundisch, M. Henneberger, C. Holtmann: Börsenwettbewerb über explizite Transaktionskosten auch beim Privatanleger?, in: Österreichisches BankArchiv, Vol. 53, No. 2, 2005, pp. 117-129.

Introduction

German regional stock exchanges rival in the horizontal inter-exchange competition for order flow of investors.[1] Particularly, they are trying to be an attractive option for private retail investors and differentiate against the competition.

Differentiation often comes in terms of *price quality* and the attempt to reduce implicit transaction costs for the investors. Therefore, many exchanges have begun to extend their established trading rules. With different labels and – in detail slightly differing – service attributes, e.g. best-execution guarantees have been introduced by most markets.[2] These offerings have in common, that an investor gets a guarantee that the price for a transaction will be at least as good as it would be at a predefined – often more liquid – reference market. For retail investors, it is not only the implicit transaction costs but also the explicit ones[3] that are relevant for his orderrouting decision.[4] These are the sum of provisions and fees that are charged by the service providers that participate in routing and matching an order as well as clearing a deal.

Kirschner analyzed market access costs at all German regional exchanges as well as for XETRA, the Suisse exchange and the Wiener Börse (Vienna exchange). He states substantial differences in the fees while comparing these trading venues.[5] Interestingly, these differences in the fees have not led to the situation that access intermediaries, such as online-brokers, just offer access to selected (regional) exchanges.[6] It remains to the investor, the retail trader, to choose between the numerous trading options taking the heterogeneous terms and services into account.

Due to the different price models of online-brokers, the differing price models of exchanges and other participating service providers become hardly comparable or even not visible by any means. Moreover, most retail investors may even not know which service providers are participating at all in routing, matching, and clearing a transaction. Hence, the objective of this contribution is to identify relevant services and their fees to route and execute an order at an exchange and to integrate these data with the price models of established online-brokers in the

---

[1] See e.g. *Picot/Bortenlänger/Röhrl* (1996); *Röhrl* (1996); *Rudolph/Röhrl* (1997) for different forms of appearances of exchanges. Concerning the competition between exchanges see e.g. *Hammer* (2004). Germany is one of only eleven countries in the world that has more than five national exchanges, see *Clayton et al.* (2006).

[2] E.g. Duesseldorf: „Quality Trading“, Hamburg/Hanover: „Execution Guarantee“, Munich: „maxone“, Stuttgart: „Best-Price-Principle“. On the potential effects of best execution offerings (so called *cream skimming*) see e.g. *Easley et al.* (1996), *Battalio* (1997).

[3] For a distinction between implicit and explicit transaction costs see e.g. *Lüdecke* (1996) or *Gomber* (2000).

[4] See e.g. *Barber/Odean/Zheng* (2005) with respect to load fees of mutual funds. See also *Picot/Bortenlänger/Röhrl* (1996), p. 117.

[5] See *Kirschner* (2003).

[6] One exception is the online-broker Fimatex, which currently does not offer access to the regional exchanges at Hamburg and Hanover (as at March 2006).

German financial services market. The following are the guiding research questions:

- What are the relevant components of the service „exchange transaction“ and which fees are charged for these components?[7]
- Is there a competition among exchanges based on the charged fees? And if so, do price models of the online-brokers distort this competition or can a retail investor recognize this competition and thus take it into account for his order routing decision?

To answer these questions, the primary service components of a stock market transaction are identified and the respective fees are evaluated. Subsequently, it will be analyzed, how and whether these fees are passed on to retail investors through the price models of online-brokers. We will focus our analysis on German regional exchanges (Berlin[8], Duesseldorf, Hamburg, Hanover, Frankfurt (FWB), Munich, and Stuttgart) as well as the electronic trading system XETRA.

The structure of the contribution is as follows: First, the service components of securities trading and their respective fees are introduced. Thereafter, forms of appearance of online-brokerage are discussed and a short market overview is provided. Then, four price models of relevant online-brokers are briefly portrayed. Finally, the price models and the fees for service components are integrated and conclusions are drawn. Concluding the contribution, a summary and outlook with respect to current developments in the market with particular emphasis on off-exchange offerings are provided.

Service components and fees in securities trading

Service components in securities trading

Market participants receive the complex service offering “exchange transaction” when trading on exchange markets. This offering is composed of different components that are provided by a number of players. Private investors typically do not have direct access to the market, but have to make use of financial intermediaries to route their orders to the markets and to hold their deposits and accounts. Both services constitute the core service offerings of online-brokers which hence can be subscribed as the provision of **market access**.

---

[7] The internal processes of a banking institution such as account services will not be covered in this analysis.

[8] The initiative „Nasdaq Germany“ was closed in autumn 2003 after having only operated for around half a year, currently, there is no trading market at the exchange in Bremen. Hence, this exchange will not be further analyzed in the following. At the end of 2005 the Bremen exchange was bought by SWX Swiss exchange. In 2007, trading of derivative securities shall start on a fully electronic exchange system.

Typically, private investors only have a direct business relation to the broker; they are indirect customers for any other service provider involved in exchange transactions. Those indirect service offerings are charged by the broker in the name of the providers.[9] The prices of the single service components are hidden (or observable and then relevant to the investors' decisions) depending on the type and transparency of the broker's business and fee model.

The following service components, which can be grouped by the different phases of a market transaction, extend the core offering of the broker:[10]

- **Information services**: Information services are used before as well as after a transaction. *Before* the trade the investment decision may be based on the information about the current market settings. *After* the trade information may be needed to monitor and, if necessary, to revise the decision. Information about the market settings is typically acquired from specialized companies like Reuters or Bloomberg. Brokers usually provide them for free or for a monthly fee; very detailed information (e.g. research or real-time quotes) are sometimes charged additionally.
- **Price determination services**: In Germany, exchange transactions can be closed at any of the regional markets or within the automated trading system XETRA that is run by Deutsche Börse AG. The fees that are charged differ between the markets and depending on the service providers, e.g. the exchange broker, involved. Exchanges charge their fees depending on the transaction volume starting with a minimum amount. Exchange brokers get special commissions, also referred to as 'courtage', for finding partners with corresponding trading interests. Moreover, exchanges charge annual fees for the market access.
- **Clearing and settlement services**: Clearing and settlement is provided by specialized companies in combination with the federal state central banks, which hold the deposits and accounts of the brokers.

In the remainder the fee models of price determination and clearing and settlement providers are discussed before those of the brokers are analyzed in more detail.

Access fees for participants at German exchanges

Online-brokers have to have an admission to any single market they plan to route orders to. This admission is typically charged with a one-time accreditation fee as well as recurring annual participation fees (see Table 1).

---

[9] Consequently, the broker sells a kind of *system* or *composite good*; see *Matutes/Regibeau* (1988).

[10] See *Picot/Bortenlänger/Röhrl* (1996) for a phase model of market transactions; see *Holtmann* (2004) for an analysis of exchanges as service providers.

Table 1. Accreditation and annual fees[11]

Exchange	Annual participation fee				Accreditation fee (one time)
	Min. in €	Max. in €	Comments	Multiplier	
Berlin	1,500	6,000	4 steps at 1.500 € each	100%	Equals the corresponding annual participation fee
Duesseldorf	1,000	22,500	Not defined explicitly	100%	Equals twice the amount of the participation fee when not already participant at another regional exchange; in the latter case it equals the participation fee
Frankfurt (FWB)	7,500	15,000	Participants accessing exclusively via Xontro 7,500 €, particpants on the floor 15,000 € with additional 1,500 € for every trader	Multiplier not existent	For lead brokers (‘Skontroführer’) 20,000 €, none for the others
Hamburg	50	10,000	Not defined explicitly	Multiplier not existent	Equals the corresponding annual participation fee
Hanover	50	20,000	Not defined explicitly	Multiplier not existent	5,000 €
Munich	500	7,000	15 steps at 250 € or 500 € each, Specialists: 35,000 € additionally	350%	1,500 €
Stuttgart	1,200	6,100	Different steps, official exchange brokers 5,000 € additionally	Multiplier not existent	1,800-6,100 €, 35,000 € for lead brokers (‘Skontroführer’)
XETRA: two direct connections	37,500	37,500			
XETRA: one direct connection, one Internet connection	28,500	28,500	Fees for XETRA	Multiplier not existent	None
XETRA: Internet connection	10,500	10,500			
@XETRA Workstation	13,500	13,500			

Especially the annual participation fees are regularly revised and vary significantly between the markets depending on the given and/or anticipated turnover

[11] Information taken from *Börse Berlin-Bremen* (2004), *Börse Duesseldorf* (2004), *Börse Munich* (2004b), *Börse Stuttgart (*2004), *Hanseatische Wertpapierbörse Hamburg* (2004), *Niedersächsische Börse zu Hannover* (2003), *Deutsche Börse AG* (2003), *Deutsche Börse AG* (2004) as well as from emails and phone calls with the market providers.

volume of the broker at the respective market[12]. Differences between the markets are immense and Berlin, Duesseldorf, and Munich define a multiplier in their scale of charges and fees that can be adapted easily to current developments.

The markets operators also charge the provision of the technical infrastructures. Brokers and other direct market participants pay monthly fees for using the standardized **Xontro System**. Xontro is the system that allows for electronic trading and order processing at the German regional exchanges – it is provided by Deutsche Börse. Market participants can choose between different forms of accessing Xontro:[13]

- **Dial-in Connection**: The Dial-in connection is the least expensive and easiest possibility to get the full range of functionalities for order processing. It is typically utilized by brokers with small or medium order processing volume or as a backup solution by brokers with a higher volume.
- **Permanent Connection**: Market participants that have high(er) processing volumes and that run own order processing systems might want to have a permanent connection to the systems of Deutsche Börse AG. For such a connection they are charged a monthly fee of 7.500 € no matter at which markets the single participant is registered.[14]

Fees for Price Determination Services

Market maker commissions that have to be paid for most transactions on regional exchanges are calculated in base points (bp) of the order volume. XETRA is not only an electronic but also an automated trading system in a sense that the matching of orders and the determination of prices takes place without human intervention – orders compete directly with each other. Instead of market maker commissions XETRA system fees are charged. Partial executions of orders are handled as separate transactions that are normally charged individually (XETRA transactions can be handled differently if executed within one day[15]). Table 2 summarizes the amounts that are charged for trading stocks; trading in bonds is calculated differently and not illustrated here.

Table 2. Market maker commission and (XETRA) system fees, respectively, for order execution[16]

Exchange	Variable allowance	Exception for German	Minimum / maximum	Notes

[12] See e.g. § 2 para. 2 in the scales of charges and fees of Börse Stuttgart.

[13] See *BrainTrade* (2004b), p. 12.

[14] Munich runs the proprietary trading system maxone that can be accessed through the Xontro connection; see *Deutsche Börse Systems*, *BrainTrade* (2004), pp. 8-9.

[15] *Deutsche Börse AG* (2003).

[16] Table 2 is based on the references already given in Table 1. The internalization system XETRA Best is not illustrated.

		blue chips (DAX)	allowance in € for stocks	
Berlin	8 bp	4 bp	0.75 / -	
Duesseldorf	8 bp	4 bp	0.75 / -	
Frankfurt (FWB)	8 bp	4 bp	0.75 / -*	
Hamburg	8 bp	4 bp	0.75 / 8.00	
Hanover	8 bp	4 bp	0.75 / -	
Munich	8 bp	4 bp	0.75 / -	
Stuttgart	8 bp	4 bp	0.75 / 12.00	
XETRA: High Volume	0.56 bp	None	0.70 / 21.00	20,000 € minimum fee
XETRA: Medium Vol.	0.588 bp	None	0.73 / 22.05	5,000 € minimum fee
XETRA: Low Volume	0.644 bp	None	0.80 / 24.15	2,000 € minimum fee

* For derivative leverage products and for derivative investment products, there is a maximum allowance of 3 € and 12 €, respectively.

If transactions are executed and documented in Xontro, contract notes are created that provide information on trading partners, price, date, fees, etc. Contract notes document the terms of any contract that has been created at an exchange. Generation and transmission of contract notes are charged by the exchanges – rates deviate between the regional markets (see Table 3). Contract note fees are charged by Deutsche Börse on behalf of the different regional exchanges.[17] Normally there are no corresponding duties on XETRA; for voluntary contract notes for XETRA contracts, one has to pay 0.06 € per transaction. In addition to this, market participants have to pay a monthly fee of 55 € for any market they access via Xontro.

Table 3. Contract Note Fees[18]

	Berlin	**Duesseldorf**	**Frankfurt**	**Hamburg**
Contract note fee in €	1.75	1.75	1.75	1.70
Monthly fee for Xontro access to the respective market in €	55.00	55.00	55.00	55.00

	Hanover	**Munich**	**Stuttgart**
Contract note fee in €	1.70	1.00	1.74
Monthly Fee for Xontro access to the respective market in €	55.00	55.00	55.00

[17] *BrainTrade* (2004a).
[18] *BrainTrade* (2004a).

Fees for Clearing and Settlement[19]

After closing a deal at an exchange the duties of the involved participants regarding delivery and payment are registered and fulfilled in the clearing and settlement phase. Besides these basis services clearing and settlement providers may offer additional services (e.g. custody).

Trades on national exchanges are reported to Clearstream Banking AG as one of the main clearing and settlement service providers. As the central depository for securities Clearstream Banking AG holds the deposits of the banks and brokers being involved in securities market trading.

Clearstream charges a basis fees for the holding of accounts and deposits and additional fees per transaction. Basis fees have to be paid monthly; they are calculated in bp from the individual volumes. For differing security types different fee scales apply. Table 4 illustrates the pricing scheme for stocks, mutual funds and similar securities. The fee is calculated by summing up the security values in the single categories (e.g. for a deposit with a volume of € 150 Mio. the first € 100 Mio. are calculated with 0.2 bp, the remaining € 50 Mio. with 0.175 bp).

Table 4. Annual Fees of Clearstream Banking AG

Deposit (market value in Mio. €)	Fee (in bp, excluding taxes)
0 to 100	0.200
From 100 to 250	0.175
From 250 to 500	0.150
From 500 to 1,000	0.125
From 1,000 to 5,000	0.100
From 5,000 to 10,000	0.080
From 10,000 to 25,000	0.060
From 25,000 to 100,000	0.040
From 100,000	0.020

Transaction based fees are also charged on a monthly basis. For a standard trade they amount to typically around € 1.15 (tax free) for both partners involved in a trade. Depending on the monthly trading volume Clearstream provides discounts and rebates which are illustrated in Table 5.[20]

Table 5. Discount Scheme for transaction-based Fees of Clearstream Banking AG

Number of bookings per month	Rebate	Fee per trade and participant
From 5,000	5.0%	1.09 €
From 10,000	10.0%	1.04 €

[19] The information provided in the next paragraph is taken from *Clearstream Banking AG* (2003) and *Eurex Clearing AG* (2004).

[20] Additional services of Clearstream and the corresponding fees are not discussed here in more detail.

From 20,000	12.5%	1.01 €
From 50,000	15.0%	0.98 €

Since 2003 Eurex Clearing works as a Central Counterparty (CCP) for transactions in stocks at the regional exchange in Frankfurt and in XETRA to allow for the netting of trades (only the net positions of the participants have to be cleared and settled), lower risks and more anonymity in trading. Hence, Eurex Clearing AG becomes the trading partner for both parties involved in a trade and insures its timely clearing (Clearstream Banking AG remains as the settlement service provider).

The fees that are charged by Eurex Clearing differ between the two procedures, namely the gross or net procedure, which can be applied. In the first case a transaction fee of € 0.70 has to be paid, in the latter a more complex pricing scheme is applied to the so called netting units – in both cases partly executions are regarded as single executions and prices are listed without taxes:[21]

Table 6. Pricing scheme of Eurex Clearing AG

Number of transactions per „settlement netting unit“ and day	Fee per transaction
From 1 to 1,000	0.55 €
From 1,001 to 2,500	0.53 €
From 2,501 to 5,000	0.51 €
From 5,001 to 10,000	0.49 €
From 10,001 to 20,000	0.47 €
From 20,000	0.45 €

Discussion of Services and Fees

Diverse specialized companies contribute to the provision of the service offering „exchange transaction“. The single fees that are charged for this complex service differ significantly between the providers:

- **Fees for market access:** Access fees differ substantial between providers and markets. This is due to the fact that (i) the interval in the official scales of charges and fees of the analyzed markets is very wide (e.g. Hanover from 50 € to 20,000 €) and (ii) the differences between the markets are also huge (e.g. Duesseldorf 22,500 € at the maximum vs. Berlin 6,000 € at the maximum). Access and accreditation fees can be regarded as fixed costs for the brokers that are (mostly) independent from the single transactions. The same holds for Xontro fees.

[21] A netting unit is a number of similar buy and sell orders hat shall be netted before settlement. The definition of netting units as well as the decision which trades may be settled in the net or gross procedures is left to each participant.

- **Price determination services**: Market maker commissions that have to be paid to the exchange broker are variable costs for the broker. At present fee structures do not differ between the markets, except for some few caps. Differences do exist between XETRA and the regional exchanges – in single cases theoretical XETRA fees amount to only 7% of the respective fees of the regional exchanges. But this more theoretical value has to be put into perspective as for most trades the minimum commission of 0.70 €, 0.73 € or 0.80 € has to be paid on XETRA (most retail trades have in fact a lower volume than 12,000 €). The pretended price advantage of XETRA is therefore smaller than anticipated at first sight.

Table 7. Market maker commission and order volume

Bp	Minimum market maker commission in €	Volume of orders up to which minimum market maker commission has to be paid
8	0.75	937.50
4	0.75	1,875.00
0.644	0.80	12,422.36
0.588	0.73	12,414.97
0.56	0.70	12,500.00

Fees for the contract notes are also variable costs that could be easily forwarded. Especially Munich is less expensive (1 €) than all other exchanges (1.70 € to 1.75 €). The fee for clearing and settlement connectivity does neither vary between markets nor is it correlated with the number of orders. These 55 € per month can be regarded as fixed costs for the broker.

- **Clearing and settlement services**: Fees are charged from Clearstream Banking AG and Eurex Clearing AG for holding deposits and for clearing and settlement services in a narrower sense. The latter can be directly associated with single trades and, therefore, can be regarded as variable costs for an online-broker. Differences between exchanges are given by the central counterparty (CCP) that exists at the markets in Frankfurt (regional market and XETRA). Trades with the CCP involved allow for significantly lower costs.[22]

After discussing the services and fees that are associated with an exchange transaction, the offerings and charges of four online-brokers are illustrated in more detail. The way and the transparency whether and how online-brokers forward the prices they have to pay to their customers is analyzed to discuss if and to what extend private investors can base their trading decisions on information about the prices that the different service providers charge for their individual offerings.

[22] It has to be mentioned though that the introduction of the CCP incorporates some significant investments in hard- and software as well as additional infrastructure components for the market participants. Additionally, the CCP is not yet available for all products. Hence traditional and new processes and infrastructures have to be run in parallel; see *Kalbhenn* (2002).

Analysis of the price models of online-brokers

Forms of appearance of online-brokerage

Companies that provide access to markets offer securities trading services for their customers. As members of the so-called *sell-side*, they are trading securities *in stead* of their customers – in contrast dealers such as market makers trade *with* their customers.[23] To put it differently, online-brokers do business in their own name but on the account of their customers.[24]

Since the beginning of the nineties their appearance has changed, particularly due to the influence of information technology.[25] Today the term *broker* – frequently specified as *discount-* of *direct-* broker – is often used for different kinds of securities trading service companies, which provide retail investors the opportunity to trade securities through the offering of access to markets. As 'access intermediaries' they are largely offering technical infrastructures that allow for entry and routing of customer orders as well as custody of deposits and accounts.[26]

Since the intensive use of the Internet, the expression *online*-broker (often synonymic also *e*-broker) has been used as an umbrella term for these different types. Over time it has embraced characteristics of differing stages of technical evolution and service offerings. Starting with the first direct-brokers that had a clear focus on cost leadership, online-brokers with a broader service offering and less discount characteristics have been entering the German market. Most of these brokers are subsidiaries of German or international private banks (see Table 8).

Table 8. Online-brokers, their parent companies and number of online accounts

Name of the broker	Parent Company	Nationality of parent company	Number of online securities accounts in Germany in 2005 (estimations)
1822direkt	Frankfurter Sparkasse	Germany	> 160,000
Citibank	Citigroup	USA	> 330,000**
comdirect bank	Commerzbank	Germany	> 550,000
Cortal Consors	BNP Paribas	France	> 500,000
DAB bank	Hypovereinsbank / Unicredito	Germany / Italy	> 900,000*
ING Diba	ING Group	Netherlands	> 458,000
Easytrade	Postbank	Germany	> 430,000
E*TRADE	E*TRADE FINANCIAL	USA	> 10,000
Fimatex	Société Générale	France	> 22,500
maxblue	Deutsche Bank	Germany	> 400,000

[23] See *Harris* (2002).
[24] See also §2 para. 3 Securities Trade Act (Wertpapierhandelsgesetz).
[25] See *SEC* (1999).
[26] See *Weinhardt et al.* (1999).

S Broker	German Savings Banks' Association	Germany	> 100,000

* Including around 450.000 accounts of the FondsServiceBank GmbH in the B2B business
** Some of which may only be used offline

In the following we will refer to an online-broker as an intermediary that focuses its business primarily on offering market access and order routing via online channels. Moreover, we will concentrate on the part of the service offering that retail investors utilize for Internet-based securities trading at a German exchange (national Internet-brokerage).

Price models of selected online-brokers

Fees which are relevant for closing a deal at an exchange will be the issue of interest in the following. Therefore, we will have a look at the fees a retail investor is charged by his online-broker. The analysis will only cover orders in stocks that were entered via the Internet[27] to be routed at a German exchange. These fees are called explicit transaction costs.[28]

A substantial part of these transaction costs are the *order provisions*. In general, the calculation of order provisions is dependent on the volume of a transaction. Moreover, some online-brokers charge a so-called *trading place fee*. Dependent on the price models there are also fees for placing a *limit order*, *canceling* or *changing* an order or for *partial executions of orders*.

In addition to these costs that are described in their *tariffs* (also called *terms & conditions* or *rates & fees* on the respective websites), so-called *external allowances* – which are generally not described in detail in the tariffs – may also be charged to the customer. They may include market maker commission, XETRA fees, clearing fees or a contract note fee. Trades in registered securities may also result in additional fees for the recordal in the register of shareholders.

In the following price models of selected online-brokers – *Cortal Consors*, *comdirect*, *DAB bank* und *maxblue* – are briefly sketched. These brokers offer a comparable service spectrum concerning market information, market access and tools for market analysis. Moreover, all of them exist for at least five years and hold more than 400.000 online accounts in Germany. The data refer to the standard tariffs, special conditions e.g. for active traders were not considered.[29]

---

[27] These results can be broadly applied also to publicly traded securities such as warrants, exchange traded funds or derivative investment certificates. Concerning bonds, there are generally at least different market maker commissions.

[28] Implicit transaction costs include e.g. the spread or the price impact of an order (see e.g. *Gomber* (2000)).

[29] Often, special customer segments such as actively trading customers are grouped into a *community*. Examples for these communities that get special conditions are „Startrader“ and „Platinumtrader“ at Cortal Consors or the „comdirect first“ at comdirect. See *Kundisch*/*Krammer* (2006) for some insights concerning attitudes of retail investors dependent on their trading activity.

The following tables briefly summarize the four price models.

Table 9. Price models (in €)[30]

	Order commission for a national Internet stock trade					Trading place fee		Other fees	
	%	fixed-step	basic charge	mini-mum charge	max. charge	XETRA / regional exchange	Limit	Change / Cancella-tion	Partial execution
Comdirect	0.25	-	4.90	9.90	59.90	1.50 / 2.50[+]	2.50[*]	2.50/2.50	✓
Cortal Consors	0.25	-	4.95	9.95	69.00	0.95 / 2.95	-	2.50/2.50	(✓)[#]
DAB bank	0.25		4.95	7.95	55.00	1.50 / 2.90	-	2.50/2.50	(✓)[#]
Maxblue	-	✓	-	19.99	34.99	-/-	-	4.99/4.99	✓

[*] This fee applies only if the order is not executed at the same day.
[+] These are minimum fees. For orders with a volume above 100,000 €, the fee is 0.0015% and 0.0025%, respectively.
[#] The order commission is waived for the second or more partial execution.

Table 10. Charged external allowances (in €)

	Market maker commission	Clearing & Settlement	Contractual note fee	Registration fee for registered securities
comdirect	✓	-	-	0.93
Cortal Consors	✓	-	-	1.95
DAB bank	✓	-	-	0.93
maxblue	✓	✓	✓	0.93

Comparison of the price models and discussion

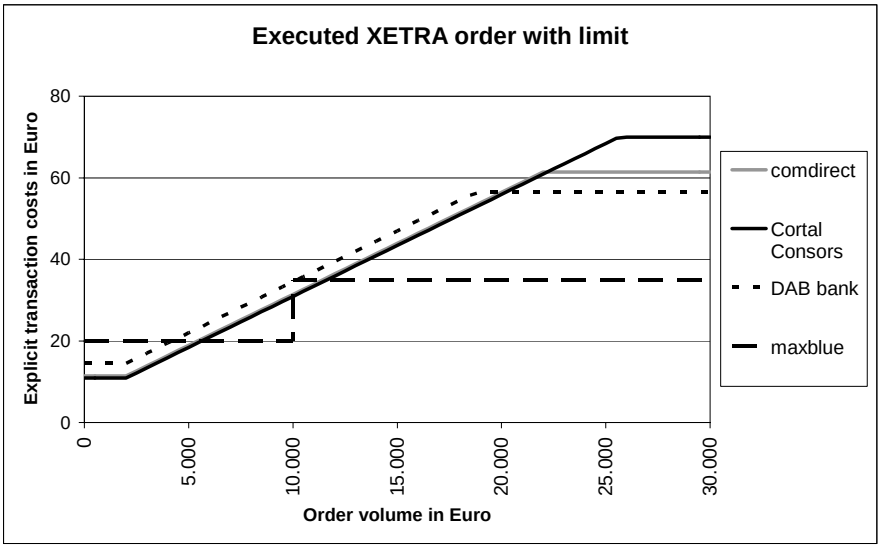
General comparison of the price models

The overview of the price models reveals that each price model on its own is quite straightforward; however, a comparison is difficult since each price models consists of different service components with their respective fees, as well as different

[30] Moreover, there may be charged additional fees in specific cases e.g. for the custody or foreign stocks. For the sake of simplicity, these fees are not covered in the following. For the detailed price models see *Comdirect bank* (2006), *Cortal Consors* (2005), *DAB bank* (2004), and *Deutsche Bank Privat- und Geschäftskunden AG* (2006).

fees for the same service component. The following figure graphically illustrates the comparison of transaction costs for a limit order in XETRA.

Fig. 1. Comparison of explicit transaction costs for a limit order in XETRA



While Cortal Consors provides the lowest explicit transaction costs for a trade volume up to 5,500 €, maxblue is the least expensive provider for an order volume between 5,500 € and 10,000 € and for volumes above 11,700 €. Cortal Consors is again the best choice between 10,000 € and 11,700 € among the big four online-brokers.

It is not the objective of this contribution to analyze these apparent differences in detail. Rather it is the questions, whether these numerous fees and commissions become visible and transparent for the retail investors.

Transparency of the fees for service components for investors

The components of the price models of the covered online-brokers do not allow for an exact mapping to service and fee components, which are charged the online-broker from exchanges or other service providers to route, execute, and clear a trade. Therefore the differentiation in market access, price discovery, and clearing and settlement fees cannot be used one-to-one for the following discussion.

All online-brokers have to pay *accreditation and annual fees at the exchanges*. These fees are independent from single orders[31] and may vary between different exchanges as well as between different online-brokers.

Theoretically, the annual participation fee could be distributed uniformly by an online-broker for each exchange according to the *expected* order volume that will be routed to this market. In contrast accreditation may be regarded as sunk costs since they were paid once and should not influence the cost calculation of online-brokers today.

However in practice, the considered online-brokers behave differently. According to answers to our inquiries concerning this issue, at least one broker sums up the annual participation fees for *all* German trading places, divides this sum by all expected national orders, and considers the result as a fixed cost allocation within the order commission. Hence, potentially different fees of the exchanges will not become visible for a retail investor.

At the time the analysis was conducted all *market makers* at German regional exchanges charged nearly the same *commissions*. These commissions are passed through to the retail investor by all of the brokers considered. Hence, competition of the exchanges would be visible for an investor but for this service component, there is no differentiation in the market with the exception of caps. There are some market segments at specific exchanges that have a cap on market maker commissions (at Stuttgart 12 € for all retail derivatives (EUWAX segment), domestic stocks, and mutual funds; at Frankfurt 3 € and 8 € for derivative leverage products and derivative investment products, respectively (Smart Trading segment); at Hamburg 12 € for all stock orders). Particularly EUWAX and Smart Trading use these caps intensively as sales argument in their marketing strategies.[32]

So-called *XETRA fees* are only passed through by maxblue, while the other three Brokers charge a flat fee (and benefit in most cases by this). Specifically comdirect charges a minimum fee of 1.50 €. Additionally, for a trade volume higher than 100,000 €, a volume dependent fee of 0.0015% is applied. This order volume, however, will be very rare exceptions for the group of retail investors. Whether the XETRA fee at Cortal Consors, comdirect, and DAB bank includes fixed costs distributions or may be a sum of other variable costs is neither visible for an investor nor for the authors.

In addition to the market maker commission at regional exchanges, Cortal Consors, comdirect and DAB bank charge a *regional exchange fee*. It is not visible at

---

[31] According to the terms and conditions of the exchanges, the annual participation fees are set with regard to the overall relevance and importance of a participator for the exchange. In the long run, these fixed costs in fact dependent in a sense on the number of orders and the volume or orders that are routed to a specific exchange.

[32] In addition, in case of incorrect information by an online-broker, a retail customer may come to the conclusion that with respect to market maker commissions, one exchange may be less expensive compared to another. E.g. one broker told us, that the market maker commission in Berlin on *all* instead of *just the DAX* stocks is 4 bp (Email as of 04/17/2004). Incorrect information was also provided by several online-brokers with respect to the charges for the recordal of registered shares.

all for a retail investor which service and fee components are included in this fixed fee. maxblue is the only broker in the sample that passes through all external allowances. Hence, differing contractual note fees (see Table 3), which in the worst case amounts to a moderate 0.75 € per trade, will only become visible for maxblue customers in the sample.

Clearing and settlement is centrally coordinated by the Clearstream Banking AG and in some cases – concerning stock trades at FWB or via XETRA – by the Eurex Clearing AG. Competition can only be expected between FWB and XETRA on the one hand and all the other regional exchanges on the other hand. According to the hotlines of the brokers in the sample, only maxblue is passing through this fee. Thus, a potential advantage of XETRA and FWB in most cases will not become visible to a retail investor.

The handling of *partial executions* is directly relevant for retail investors. Whereas Cortal Consors and DAB bank waive their order commission for the second and more partial executions but charge trading place fees and external allowances. Maxblue and comdirect charge for each partial execution as if it was a single and separate order – except for XETRA trades that are executed on the same day. Thus, trades at maxblue or comdirect may become substantially more expensive compared to trades at Cortal Consors or DAB Bank due to partial executions. One should note that partial executions generally only occur on XETRA. Regional exchanges in most cases execute an order completely in one step; e.g. Börse Munich advertises a partial execution rate of below 0.2% of all orders.

Discussion and limitations

There is a number of service providers involved in the complex offering "exchange transaction". On the level of online-brokers there are particularly different fees for the participation at the different exchanges (see Table 1). Another aspect is the diversity in fees for contractual notes (see Table 3). For all other service and fee components, there is only competition on two levels:

- Generally, the market maker commission is identical for all regional exchanges – expect for some few exchanges that offer a cap on this commission – and differs significantly from the XETRA fee. The XETRA fee is substantially lower compared to the market maker commission, however, in most cases the minimum fee will be triggered for a retail trade. Thus, the difference to the market maker commission is relativized in most instances.
- Concerning the clearing and settlement of trades, the fees of the FWB and XETRA may be lower compared to the other regional exchanges due to the introduction of the Central Counterparty (CCP) – left alone the one time fixed costs for the adaptation of the intermediaries' infrastructures. A retail investor may benefit from the scale, in terms of the number of transactions and the consolidated order volume, of his intermediary, since the fees are dependent on the number and the volume of the transactions of the intermediary in total. These discounts are independent of the exchanges, though.

Normally, for retail investors the moderate differences in the fees between the competing exchanges do not become visible due to the price model of his broker. However, there are differences in these models: On the one hand Cortal Consors and DAB bank refrain from charging variable costs for most of the external allowances but charge a fixed fee per market. On the other hand, maxblue passes through all external allowances that may be attributed to a specific trade. Whether the price models affect the different investors' behavior can not be observed.

Additionally, one important aspect should be mentioned here: None of the analyzed brokers lists the different costs for the different exchanges. Moreover, it took even the authors of this contribution a number of weeks to get to know all the relevant data. Thus, most of the time, an investor will only know about the fees at a trading place ex post on his contract note and will not have at the same time the opportunity to compare these costs to the costs the same trade would have triggered using a different trading place.

Some limitations accompany the presented analysis which should be taken into account while talking about the conclusions above:

- We just had a look at transactions at Germany exchanges in national stocks. There may be substantial differences in the service components and fees talking about foreign exchanges or trades in foreign securities.
- We just analyzed the price models of four established online-brokers in the German market. There may be substantially differing terms & conditions at other brokers that potentially would lead to other conclusions – Citibank e.g. recently introduced a flat rate model at 9.99 € per trade without market maker commissions, trading place fees or limit fees.

Outlook: Off-exchange-markets as competitors

So far, only markets in Germany under the official market and legal supervision of the state-run Exchange Supervisory Authority have been analyzed as trading venues. These official exchanges provide pre- and post-trade transparency and offer order-driven market models.

In recent years additional trading venues gained importance for retail investors: Off-exchange trading on specific alternative trading systems (ATS). Bypassing the traditional exchanges, retail investors can communicate directly via their brokers with the issuers of retail derivatives or market makers. Investors get the chance to request 'a quote' (meaning the sell and the buy price the counterparty is willing to trade for) for securities to be bought or sold. The market maker or issuer sends a quote to this specific customer and he may decide upon a mouse click within a specified time interval (typically 3 to 8 seconds), whether he wants to buy (or sell) the securities at the posted price. This market model is called request-for-quote and belongs to the *quote-driven* trading mechanisms.[33]

[33] See e.g. *Holtmann* (2004).

Referring to a current study of the authors in these markets primarily retail derivatives are traded and account for around 80% of the total turnover via ATS. Due to the lack of transparency, for all turnover figures, prices and volumes of executed trades, one has to rely on estimations of experts for this market. They estimate the turnover via ATS in investment retail derivatives to around 50% of the total turnover of 41 billion Euro in this product category in 2004, whereas the turnover via ATS in levered retail derivatives accounts for around 60% of the total turnover of 52 billion Euro in 2004. In 2005, not only the market itself saw another increase in the double digits but also trading via ATS became ever more popular among private investors. But not only retail derivatives are traded via ATS, also a number of German bonds, most German stocks, European blue chips, all NASDAQ and Dow Jones stocks as well as some selected Asian stocks can be traded via ATS.

Talking about competition of trading places, here it really becomes visible for the customer. However, it seems that this is mostly due to the price models of the online-brokers. Regardless of the real payment streams between brokers and issuers or market makers, the explicit transaction costs for the customer are lower at all analyzed brokers compared to a trade that is executed at an exchange.

- maxblue offers the greatest discount compared to its prices for an exchange executed order. Generally, the broker commission is 5 € lower and no external allowances are charged.[34]
- DAB bank offers a substantial discount on the broker commission only on trades with three[35] selected issuers and market makers (so-called "star partners"). For these, there is a flat fee without external allowances. For all other issuers and market makers, the broker commission is the same and there is a fixed trading place fee of 0.80 €, which is substantially lower compared to the regional exchange fee of 2.90 € or a XETRA fee of 1.50 €. No other external allowances are charged.[36]
- comdirect and Cortal Consors just waive all external allowances but charge the same broker commission as if the order would be routed to an exchange.[37]

Additionally, all of the brokers listed above, offer free trade campaigns with selected issuers for a limited time span (usually for one to three months) or marketing campaigns with reduced broker commissions for all trades via ATS – sometimes only for specific (community) groups of customers.

To sum up, competition between exchanges on the one hand and specialized Off-exchange-markets on the other hand is much more visible for the retail investor compared to the competition among the different exchanges. The caps on the

[34] The only external allowance is a so-called liquidity provision fee which is charged when trading with the market maker Lang & Schwarz.

[35] Out of more than 20.

[36] The only external allowance is a so-called liquidity provision fee which is charged when trading with the market maker Lang & Schwarz.

[37] Again, the only external allowance is a so-called liquidity provision fee which is charged when trading with the market maker Lang & Schwarz.

market maker commission at EUWAX and Smart Trading can be interpreted as a direct answer to this price competition described above.

Summary

German regional exchanges compete among themselves and against the fully electronic cash market trading system XETRA for the order flow of retail customers. Additional competition can be observed with the off-exchange markets.

In this contribution at first hand, we described what the fee models of these exchanges mean for direct market participants, such as access intermediaries like online-brokers. Next, it was analyzed, whether any price competition between the exchanges and other service providers that contribute to the execution and settlement of a trade are traceable and seem decision-relevant for the retail customer as an indirect market participant. Four established online-brokers in the German market were selected and their price models were analyzed with regard to the question: Do the price models of online-brokers distort or even blur (if any) existing price competition of German exchanges. Online-brokers were chosen for at least one major reason: They focus their business on providing information about and access to markets, order routing and account related services. Thus, cross-subsidization hopefully will be much less distinct compared to other financial services providers, specifically branch-based banks. Finally, a brief outlook in the off-exchange markets – an increasingly recognized alternative to execute an order for a self-directed retail investor – was provided.

All in all, the cost competition between the German exchanges can be classified as moderate. Solely in the domain or participation fees at an exchange and the contractual note fees differ substantially between the considered trading venues. With respect to clearing and settlement services, small cost advantages can be stated for XETRA and FWB due to the introduction of the CCP compared to the other regional exchanges. Often, these costs are included in the market-independent broker commissions. Partially, a fee is charged, which just differentiates between XETRA on the one hand and regional exchanges on the other.

However, there are some differences in the price models of the four analyzed online-brokers. While particularly Cortal Consors and DAB bank do not charge external allowances except for the market maker commission, maxblue passes through all external allowances. Whether this results in different investment and trading behavior at the site of the retail investor is questionable, yet not observable.

For the anticipation of explicit transaction costs, it seems not only advisable to have a look at the tariffs of all the participation service providers but also at the market model of the exchanges, which define the trading rules. For retail investors who generally trade with comparably low volumes per transaction, it might be favorable to choose trading places where partial executions are avoided. Particularly on XETRA, partial executions are quite common and may result in substantially higher transaction costs compared to an order that is executed at a regional

exchange – even if the commission and fees for a single transaction is less expensive on XETRA.

Talking about market models, the quote-driven off-exchange markets in Germany observed an increase in importance in recent years. Most established online-brokers meanwhile offer not only access to all German exchanges but also to at least one off-exchange market where retail investors can trade directly with issuers or market makers. The fees for trading off-exchange provide (partially substantial) discounts compared to orders routed and executed at exchanges. Moreover, due to the quote-driven business-model, partial executions are impossible. With respect to clearing and settlement, there are some new developments that might lead to further competition in the future. Since February 2004 clearing and settlement are allowed at any licensed central depository for securities.[38] However, Clearstream Banking AG is still the only player in this market.

In summary, inter-exchange competition is moderate with respect to costs and mostly becomes not visible to the retail investor due to the distorting price models of online-brokers. However, price competition between exchanges on the one hand and ATS without governmental supervision on the other hand seem to be the real battlefield of the years to come. It remains to be seen, which consequences will be brought by the current re-regulation of the securities market and the implementation of the Markets-for-Financial-Instruments (MIFID) directive.

References

Barber, B. / Odean, T. / Zheng, L. (2005): Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows, forthcoming in: Journal of Business, 2005, vol. 78, no. 6, pp. 2095-2119.

Battalio, R. (1997): Third Market Broker-Dealers: Cost Competitors or Cream Skimmers? Journal of Finance, 1997, vol. 52, pp. 341-352.

Börse Berlin-Bremen (2004): Gebührenordnung der Börse Berlin-Bremen, as at 1.1.2004.

Börse Duesseldorf (2004): Gebührenordnung.

Börse München (2004a): Jahresbericht 2003 / 2004 – Mit Vielfalt und Wettbewerb Marktchancen erschließen und Zukunft sichern.

Börse München (2004b): Gebührenordnung für die Börse München. In Kraft seit 1.10.2003.

Börse Stuttgart AG (2003): Jahresbericht 2002 der Baden-Württembergischen Wertpapierbörse.

Börse Stuttgart AG (2004): Gebührenordnung, as at 1.1.2004.

BrainTrade (2004a): Gebühren für XONTRO.

BrainTrade (2004b): Kreditinstitute – Anmeldung XONTRO, as at 25.2.2004.

Clayton, M. J. / Jorgensen, B. N. / Kavajecz, K. A. (2006): On the presence and market-structure of exchanges around the world, in: Journal of Financial Markets 9 (2006) pp. 27-48.

[38] See *o.V.* (2004).

Clearstream Banking AG (2003): Preisverzeichnis Inland für Kunden der Clearstream Banking AG, Frankfurt, as at 17.11.2003.
Comdirect bank (2006): Preis- und Leistungsverzeichnis, as at 01.03.2006.
Cortal Consors (2005): Preis- und Leistungsverzeichnis, as at 01.07.2005.
DAB bank (2004): Preis- Leistungsverzeichnis der DAB bank, as at 01.11.2004.
Deutsche Bank Privat- und Geschäftskunden AG (2006): Preis- und Leistungsverzeichnis, as at 01.01.2006.
Deutsche Börse AG (2003): Preisverzeichnis ab 01.04.2003 für die Nutzung des elektronischen Handelssystems Xetra.
Deutsche Börse AG (2004): Gebührenordnung für die Frankfurter Wertpapierbörse, as at 02.01.2004, FWB12.
Deutsche Börse Systems, BrainTrade (2004): Kreditinstitute – Technische Anbindung, Version 4.0, as at 19.1.2004.
Easley, D. / Kiefer, N. / O'Hara, M. (1996): Cream-Skimming or Profit Sharing? The Curious Role of Purchased Order Flow. in: Journal of Finance, 1996, vol. 51, pp. 811-833.
Eurex Clearing AG (2004): Preisverzeichnis, as at 23.02.2004.
Gomber, P. (2000): Elektronische Handelssysteme – Innovative Konzepte und Technologien, Physica, Heidelberg.
Hammer, T. (2004): Kleiner Handel, großer Gewinn, in: Die Zeit, no. 22, 19.05.2004, p. 29.
Hanseatische Wertpapierbörse Hamburg (2004): Gebührenordnung, as at: März 2004.
Harris, L. E. (2002): Trading and Exchanges, Oxford University Press, New York, N.Y.
Holtmann, C. (2004) Organisation von Märkten – Market Engineering für den elektronischen Wertpapierhandel, Dissertation, Fachbereich Wirtschaftswissenschaften, Universität Karlsruhe (TH), Karlsruhe.
Kalbhenn, C. (2002): Der unbeliebte Kontrahent, in: Börsenzeitung, no. 112, 14.06.2002, p. 8.
Kirschner, S. (2003): Transaktionskosten der Börsen im deutschsprachigen Raum, in: Bankarchiv, no. 11, 2003, pp. 819-828.
Kundisch, D. / Krammer, A. (2006): Transaktionshäufigkeit als Indikator für die Angebotsgestaltung bei deutschen Online-Brokern, in: Der Markt, Vol. 46, no. 1, 2006.
Lüdecke, T. (1996): Struktur und Qualität von Finanzmärkten, Gabler, Wiesbaden.
Niedersächsische Börse zu Hannover (2003): Gebührenordnung, as at 11.8.2003.
Matutes, C. / Regibeau, P. (1988): Mix and Match: Product Compatibility without Network Externality, in: RAND Journal of Economics, Vol. 19, S. 221-234.
Picot, A. / Bortenlänger, C. / Röhrl H. (1996): Börsen im Wandel, Fritz Knapp, Frankfurt a.M.
o.V. (2004): Deutsche Börse ermöglicht Rivalen Abwicklung, in: Handelsblatt, no. 42, 01.03.2004, p. 22.
Röhrl, H. (1996): Börsenwettbewerb: Die Organisation der Bereitstellung von Börsenleistungen, Deutscher Universitäts-Verlag, Wiesbaden.
Rudolph, B. / Röhrl, H. (1997): Grundfragen der Börsenorganisation aus ökonomischer Sicht, in: Hopt, K. J. / Rudolph, B. / Baum H. (Hrsg.): Börsenreform - Eine ökonomische, rechtsvergleichende und rechtspolitische Untersuchung, Schäffer-Poeschel, Stuttgart, pp. 143-285.
SEC (1999): On-Line Brokerage: Keeping Apace of Cyberspace. Securities and Exchange Commission (SEC), New York, N.Y.
Weinhardt, C. / Gomber, P. / Holtmann, C. / Groffmann, H.-D. (1999): Online-Brokerage als Teil des Online-Banking - Phasenintegration als strategische Chance, in: Locarek-

Junge, H. / Walter, B. [eds.]: Banken im Wandel: Direktbanken und Direct Banking, Bd. 18. Berlin-Verlag 2000, Berlin, pp. 99-120.