INTERNATIONAL BUSINESS OF BANKING: THE PRICING EXAMPLE OF RETAIL CURRENCY SPREADS

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Abstract

In this paper the pricing of a specific service of currency exchange based on the retail exchange rate spreads is studied on the example of four international banking groups. The aim of this study is to explore pricing of currency exchange services based on bid-ask differences in some commercial banks and possible price discrimination in this segment of market comparing the behaviour of Western mothers and Eastern daughters in European international banking groups. The retail currency rate spreads in different bank groups and countries are compared with each other. The main results of the study are that statistically significant differences exist in the spreads set by banking groups in different countries. All banking groups in the pilot sample offer more favourable rates in Western countries indicating that the pricing policy of bank groups may be discriminatory. The volatility of spreads over different currencies suggests that different decision making mechanisms may be present in the groups depending on the location of banking unit. The results of this pilot study suggest that further research is needed to understand the extent and the mechanism of findings.

Keywords: *international business, pricing, discrimination, commercial banking, currency rates, spreads.*

Introduction

It is well known fact, that the international pricing strategy is a dominant component of marketing mix of multinational companies (Hill, 2009). The main objects of research of this study are the spreads of retail currency exchange rates (that is a way to price the service) offered to customers in commercial bank groups both in Western and Eastern Europe. The retail currency markets of countries seem to be separated from each other and the banks seem to use discriminatory pricing when setting retail currency spreads in these countries.

The study is based on the premise that the currency exchange rates and bid-ask spreads are mainly determined by underlying macroeconomic factors influencing banks in a country in a similar way and by the internal policies of MNC-s that may or may not be discriminatory. Lyons (2001) describes three major approaches to exchange rates: goods market, asset market and market microstructure approaches. The structure and processes of relevant financial markets and institutions should be taken into account to understand the

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conflicting aims of profit seeking and policy making as forces determining the market outcome.

The processes going on in and the convergence of the financial sector in EU have been subject to number of studies but, surprisingly, the currency rates that the banks charge and pay their customers have almost left out of the interest by academic researchers. The retail exchange rates of commercial banks have not been studied much and the focus has been on the country level and the interbank market. The situation is understandable if one takes into account fact that only about 5% of currency market is connected to economic needs of agents and remaining 95% is driven by speculative motives (Krishnan et al, 2009). Example topics of the research on influence of currency rates on economy are relationship between trading volumes and rates' volatility (Bjønnes et al, 2005) and relationship between currency rates and stock prices (Stavarek, 2004).

The branches or subsidiaries of foreign banks have dominant positions in many of Central and Eastern European countries' banking markets today (Barisitz, 2009). The main hypothesis in the paper is that the differences in exchange rate spreads between banks of the same banking groups in Eastern and Western Europe are significant. The aim of this exploratory paper is to study pricing of currency exchange services based on bid-ask spreads in commercial banks and the existence of possible price discrimination. It is suggested in the paper that exchange rates in banks of Western Europe are more favourable for clients than in Eastern Europe. Following main research questions were kept in mind:

1 to explore the pattern of behaviour of different banking units in retail exchange sector inside of same countries;

2 to compare retail currency spread inside the banking group units in different countries;

3 to compare based on retail currency spreads the behaviour of MNC banking units;

4 to prepare methodology for the second stage of study.

In the section 2 an overview of relevant literature is given that is followed by the description of the sample and methodology of comparison. The limitations that derive from data collection process are discussed and data and sources are described in section 3. The results of comparison of banks in the countries under study are described in the section 4. The section ends with the comparison of currency rate spreads in the banks of groups of countries dealing with aggregated differences on the level of country groups. The short discussion of results is given in conclusions part 5.

Overview of related literature

The area of the study is relatively unexplored despite the fact that enormous amount of literature exists on the related fields of research. Extensive literature on the interbank currency

exchange market (that is a major factor influencing also retail rates) exists today with detailed studies on the influences of different factors on the currency rates and currency rate spreads. The main features have been long quoted even in textbooks – "spreads on the interbank market are based on the breadth and depth of a market for a given currency as well as on the currency's volatility" (Clark, Levesseur, et. al., 1993, p. 147). Levi (1990, p. 37) mentions without further discussion that banks charge their customers more than interbank ask rate and pay less than bid rate and that the size of the spread depends mainly on the volume of retail transactions. Lyons (1995) finds that inventory risk is main determinant of currency rate quoted spreads.

Currency rates became important object of research after the breakdown of the Bretton Woods fixed-parity system both because of policy considerations and because of the needs of international financial management in MNCs (Multinational Corporations). The research on the relationship between exchange rates and (goods) prices has been developing rapidly during recent decades (Menon, J., 1995; Goldberg and Knetter, 1997). Either exchange rate pass-through (Goldberg and Knetter, 1997) or the pricing-to-market as termed by Krugman (1987) are main strands of literature.

Studying financial integration in Europe Pichler, Steiner *et al* (2008) mention that "integration and the single market for financial services *per se* are the ultimate objective of the EU's integration efforts". While Horobet, Joldes *et al* (2008) find some exchange rate convergence in Central and Eastern Europe, the findings of this paper contradict to these results in retail markets.

It is well know that if international bank groups have certain degree of monopoly power in their markets then they can increase the profit discriminating against the customers in a particular country of operations (Hill, 2009). The literature on price discrimination has long history and it is customary to speak of three major types of price discrimination beginning from Pigou (1920). Detailed typology of price discrimination was provided early by Cassady (1946) and Machlup (1955). The literature on pricing of (retail) currency exchange services in international setting is far less extensive compared to previous topics despite the fact that the topic is raised on the textbook level.

Main factors influencing the bid-ask spreads have been identified by the microstructure theory: order-processing costs, asymmetric information costs, and inventory holding costs (Koutmos and Martin, 2011). Deeper analysis of determination of spreads is given by later market microstructure literature that counts three or four components for the spreads: inventory risk, operating costs (and profit margin), monopoly power, and adverse selection (Huang and Stoll (1997), Harris (2003)). Monopoly power is frequently excluded in currency microstructure literature (Rime, (2003)). The first prominent study of currency bid-ask spreads by Glassman (1987) showed that these increase with volatility and trading volume.

Example topics of the research on influence of currency rates on economy are relationship between trading volumes and rates' volatility (Bjønnes et al, 2005) and relationship between currency rates and stock prices (Stavarek, 2004). Two important results from recent literature apply to our study.

The spread is dependent upon the type of client (Fan and Lyons, 2003) and upon the level of activity (order flow) influences the size of the spread (Osler, 2006). Based on this result we divide research object and consider in our study separately the big (GBP, JPY, USD) and the small currencies (NOK, SEK, DKK, CHF).

The sample, data, and the methodology of comparison

The sample was composed according to the objective of the study but the number of constraints had to be taken into account when finalizing the sample. Table 1 illustrates the population. The attempt is made to include into the sample both Western and Eastern European countries and the EU banks where the headquarters of the banks are located in Western part of EU and the daughter companies in Eastern Europe.

	Banks	*Western countries*					*Eastern countries*				
		A	*B*	*C*	*D*	*xxxx*	*E*	*F*	*G*	*H*	*I*
Western mother	*1*	*A1*	*B1*	*C1*			*E1*		*G1*		
	2		*B2*	*C2*	*D2*	*Xxxx*	*E2*	*F2*	*G2*	*H2*	
	3	*A3*		*C3*	*D3*	*Xxxx*			*G3*	*H3*	
	4		*B4*		*D4*	*Xxxx*					
xxxx		*xxx x*	*xxx x*	*xxx x*	*xxx x*	*xxxx*	*xxx x*	*xxx x*	*xxx x*	*xxx x*	*xxx x*
Eastern mother	*5*	*A5*	*B5*			*xxxx*		*F5*	*G5*		
	6		*B6*	*C6*	*D6*	*Xxxx*	*E6*	*F6*		*H6*	
	7					*Xxxx*		*F7*		*H7*	*I7*

Table 1. The structure of the population of the banks.

Seemingly, the potential data set may be enormous. Closer inspection shows that only few banks can easily be incorporated into the study and sample selection is influenced by availability of data. Many banks have subsidiaries or branches in Eastern Europe but only few of them in Western Europe, homepages of Western banks tend to be uninformative about currency rates, and last, only selected retail currency rates are public in majority of banks;

	Unicredit	*Erste Group*	*Raiffeisen*	*Commerzbank*
Czech Rep.	*X*	*X*		
Austria		*X*	*X*	
Poland			*X*	*X*
Germany	*X*			*X*

Table 2. Countries and Bank Groups in the sample.

The sample's structure was designed symmetrical with the country and bank pairs described in Table 2. Germany and Austria represent Western Europe in the study, Czech Republic and Poland represent Eastern Europe. The four countries were chosen because of the geographic and economic closeness. The differences (*spread*) from the daily exchange rates of European Central Bank were calculated for all the banks' retail currency rates being compared. Average spreads were found based on the daily time series (January – March, 2010). The analysis and comparison of banking units is based on these averages. Student's t-test was used to control for statistical significance of findings with confidence level of 0,05 (the results given in Table 5). For the in-country, in-group, and between countries comparisons the differences of corresponding larger and smaller spreads quoted by banking units were found.

Four international banking groups were chosen into the sample – Unicredit Bank, Erste Group, Raiffeisen Bank, and Commerzbank (called Unicredit, Erste, Raiffeisen, and Commezbank in following sections and Tables for simplicity). Each of these banks runs business at least in two of sample countries and each of countries has two banking units from the sample's bank group present. In all cases the headquarters of banking groups are located in the West and daughter companies are in the East.

Unicredit Bank Czech Republic belongs to the Unicredit Group with Italian roots (History of the Group, 2010). The data were drawn from Unicredit Bank Czech Republic complete Exchange rates (2010). Another bank from the country is Erste Group's Česká Spořitelna (Erste Group, 2010), the data are obtained from Česká Spořitelna exchange rates (2010). From Poland BRE Bank and Raiffeisen Bank Polska S.A. (70% of BRE Bank's shares are owned by Commerzbank) were chosen. Data come from BRE Bank exchange rates (2010) and from Exchange Rates of Raiffeisen Bank Polska S.S. (2010). From Austria Raiffeisen Zentralbank Österreich and Erste Group were included into sample. The data come from Raiffeisen währungen (2010) and from Erste Bank Market Overview: Currencies (2010). HypoVereinsbank (HVB, called Unicredit below for clarity reasons) and Commerzbank are the two banks from Germany. The data come from Commerzbank Devisen-Marktkurse (2010) and from HypoVereinsbank Währungen (2010).

The data set in the study contains approximately 6950 retail currency rate values. Two types of currencies were chosen for study to control possible size effects based on the results of order-flow literature of market microstructure above. "Big" currencies are GBP, USD, and JPY. "Small" currencies are CHF, DKK, SEK, and NOK. As a benchmark, currency rates quoted by European Central Bank or national Central Banks outside the Euro area were used throughout the study. The data come from European Central Bank Euro foreign exchange reference rates (2010).

The analysis was carried out based on differences of bid currency rates and those of

Central Banks (spreads). First, the currency rates of non-Euro countries were transformed to Euro bases using the local Central Bank's Euro versus home currency rates. Second, to make all data comparable the spreads with ECB rates were calculated. Actual comparison of banks and countries was made using these spreads.

As a first step of the study average spreads and the coefficients of variation (standard deviation divided by average value of corresponding spreads) for the sample were calculated for all spreads over banks, countries and currencies (Table 3). The results indicate that systematic differences exist in the behaviour of bank units in the sample.

Bank	*CHF*	*DKK*	*GBP*	*JPY*	*NOK*	*SEK*	*USD*	*Average*
Poland Raiffeisen	*3,152 (16)*	*3,143 (16)*	*3,151 (18)*	*3,156 (18)*	*3,084 (18)*	*3,135 (19)*	*3,176 (16)*	*(17,4)*
Poland Commerzbank	*2,942 (11)*	*2,771 (11)*	*2,436 (16)*	*2,84 (18)*	*2,743 (10)*	*2,775 (10)*	*2,488 (16)*	*(13,0)*
Czech Erste	*1,796 (19)*	*1,835 (16)*	*1,838 (27)*	*1,729 (51)*	*1,765 (20)*	*1,761 (21)*	*1,749 (36)*	*(27,2)*
Czech Unicredit	*1,983 (17)*	*2,012 (14)*	*2,014 (25)*	*1,962 (39)*	*1,921 (18)*	*1,938 (19)*	*1,767 (34)*	*(23,5)*
Austria Erste	*0,500 (14)*	*0,376 (2)*	*0,314 (55)*	*0,526 (51)*	*0,338 (42)*	*0,359 (37)*	*0,340 (48)*	*(35,4)*
Austria Raiffeisen	*0,186 (88)*	*0,015 (121)*	*0,393 (58)*	*0,629 (68)*	*0,248 (73)*	*0,327 (55)*	*0,430 (57)*	*(74,34)*
Germany Unicredit	*0,197 (35)*	*0,272 (4)*	*0,299 (65)*	*0,353 (81)*	*0,302 (56)*	*0,275 (64)*	*0,367 (55)*	*(51,44)*
Germany Commerzbank	*0,137 (41)*	*0,268 (3)*	*0,205 (72)*	*0,189 (106)*	*0,245 (50)*	*0,227 (47)*	*0,201 (64)*	*(54,79)*

Table 3. Average spreads and coefficients of variation of daily spread (standard deviation divided by average spreads; in brackets, %, January-March 2010).

In-country and in-group comparison of currency rate spreads

First, the results of the comparison of different bank's spreads inside the countries are discussed. The currency rates in the same country are driven by the same factors except in-group policy factors and other possible influences that are derived from belonging to a certain banking group. In this subsection we compare the banking units with the aim to uncover differences of spreads of different banking groups operating in same environment. The data indicate that the different banks' views on suitable currency rates in the same country differ from each other considerably but the differences remain smaller compared to the differences between countries as we will see later in this paper. The bank groups and group units seem to have different policies of towards their clients in different locations.

In Czech Republic Unicredit's and Erste's banking units were compared with each other. Unicredit's spreads are larger in the case of all currencies in sample as can be evidenced on the Figure 1. The spread is the largest for GBP (2,014%) and the smallest for

USD (1,767%) in Unicredit. Erste's the largest spread is also for GBP (1,838%) and the smallest for JPY (1,729%). The spreads' differences are significant only in the cases of "small" currencies (Table 5).

The retail currency rate spreads of sample banks in Poland are very similar to those in Czech Republic. In all cases the spread is larger in one bank, Raiffeisen, but the differences of spreads are larger compared to the case of Czech Republic (Table 4). In Raiffeisen the spread is the largest for USD rates (3,177%%) and the smallest for NOK rates (3,085%). Coommerzbank's the largest spread is for CHF (2,94%) and the smallest for GBP (2,436%). Thhe differences are statistically significant for all currencies (Table 5).

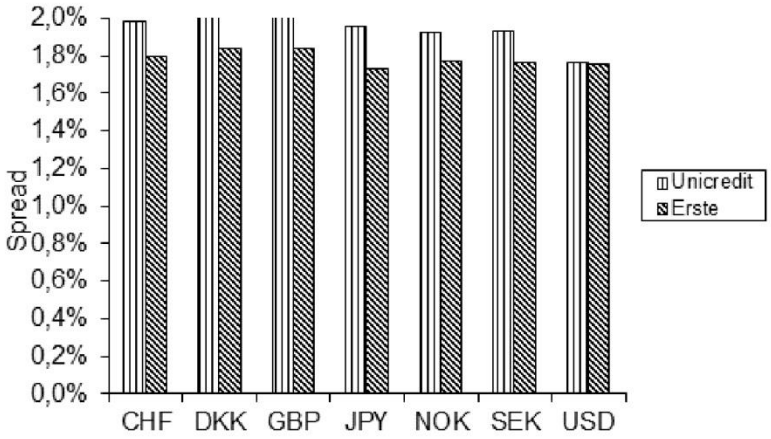

Figure 1. Comparison of average spreads in Czech banks.

The pattern of the spreads is very different compared to the earlier resuults in the case of Austrian banks (Figure 2) being distributed unevenly with Erste having largger spreads in the case of 4 currencies and Raiffeeisen in the case of 3 currencies. Also the level of spreads is smaller having the maximum below 0,65%. Both banks have their largest spreads in the case of JPY (Raiffeisen – 0,629% and Erste – 0,526%). Erste's the smallest spread is for GBP (0.314%) and Raiffeisen's the smallest spread for DKK (0,015%). Except JPY and SEK t he differences of average spreads are statisticallly significant (Table 5).

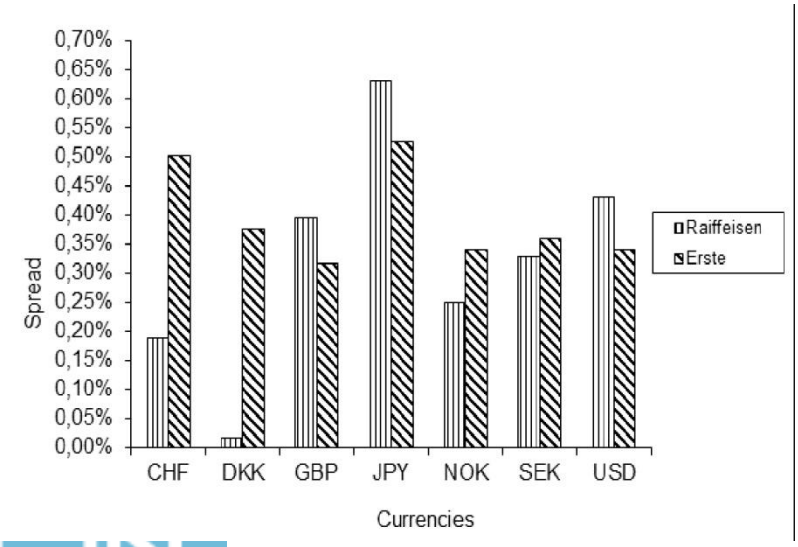

Figure 2. Comparison of average spreads in Austrian banks.

Retail currency spreads in Germany's banking units are distributed very si milarly to those in Austria but the level of spreads is lower. The spreads are larger in Unicredit foor all currencies in sample. The largest spread in Unicredit is for USD (0,367%) and in Commerzbank for DKK (0,268%). The spread is the smallest in Unicredit for CHF (0,197%) and in Commerzbank also for CHF (0,137%). All differences are statistically significant (Table 5) except of NOK and SEK.

The results of pair wise comparison (statistical significance) are described in Table 5. The reasons for the results are not clear but it seems to be of importance for future research that in the case of smallest banking sector (Czech Republic) the differences were not significant for the big currencies and that in the case of biggest banking sector (Germany) in the sample the differences were not significant only for the two small currencies. The different distributions of spreads in country groups cannot be explained only by macroeconomic factors and they exist most probably due to the in-group policies. The bank groups seem to have different inter group policies toward their customers in two parts of Europe. These policies can exist only if these markets are separated enough and the customers are not able to take advantage of the arbitrage opportunities.

	Czech Rep.	*Austria*	*Poland*	*Germany*
	Unicredit-Erste	*Raiffeisen-Erste*	*Commerzbank-Raiffeisen*	*Commerzbank-Unicredit*
CHF	+	+	+	+
DKK	+	+	+	+
GBP	-	+	+	+
JPY	-	-	+	+
NOK	+	+	+	-
SEK	+	-	+	-
USD	-	+	+	+

Table 5. Statistical significance of differences of spreads (Students t-test, 95% confidence).

Other important questions are whether the banking groups act differently in different countries and to what extent. If price discrimination is present in the data it could be evidenced by comparison of currency spreads of the subunits of same banking group in different countries. The objective is in this subsection to compare the spreads of the same bank group units acting in different countries. The aim is to understand whether the spreads

are mainly determined by the membership in a group or they depend on the location. In all cases the first banking unit compared is the Western mother bank and the second is the Eastern daughter bank.

The comparison of the units of Unicredit group in Germany and in Czech Republic (Table 1) showed that the levels of spreads in these countries are considerably different over the countries but very similar over the currencies under study. In Germany the spreads are between 0,19% - 0,4% and in Czech Republic between 1,8% - 2,1%. The differences of spreads are distributed evenly (Table 6). The comparison between units of Erste in Austria and Czech Republic showed that the pattern is very similar to the previous one. In Austria the spreads were between 0,31% - 0,53% and in Czech Republic between 1,72% - 1,84%. The Commerzbank's spreads in Germany are 0,13% - 0,27% being more evenly distributed compared to Poland (2,4% - 3,0%). The analysis of data from Raiffeisen group gave similar results compared to those above. In Austria the spreads are between 0,01% - 0,63% being most volatile in the whole sample. In Poland the spreads are more evenly distributed and are between 3,08% - 3,18%.

The results of this section indicate again that all bank groups in the sample have different policies towards their Western and Eastern customers (Table 6).

	Unicredit	*Erste*	*Commerzbank*	*Raiffeisen*
	Germany-Czech Rep.	*Austria-Czech Rep.*	*Germany-Poland*	*Austria-Poland*
CHF	*1,79*	*1,30*	*2,81*	*2,97*
DKK	*1,74*	*1,46*	*2,50*	*3,13*
GBP	*1,72*	*1,52*	*2,23*	*2,76*
JPY	*1,61*	*1,20*	*2,65*	*2,53*
NOK	*1,62*	*1,43*	*2,50*	*2,84*
SEK	*1,66*	*1,40*	*2,55*	*2,81*
USD	*1,40*	*1,41*	*2,29*	*2,75*

Table 6. Comparison of differences (% points) of average spreads from ECB rates.

To finalize the analysis the spreads are compared by countries in this paper. We compare the banking units in two pairs of similar countries and also between the country groups (Eastern Europe and Western Europe).

The spreads quoted by the banks under study in Czech Republic and Poland are compared first. Here, the spreads are calculated based on currency rates of local central banks (National Bank of Poland fixing, 2010 and Selected exchange rates ..., 2010) instead of ECB. It is evident from Figure 3 that the spreads are larger in Poland being also statistically significant. Czech spreads remain between 1,7% - 2% and in Poland the spreads are in interval 2,8% - 3%.

The spreads are distributed very differently in the case of Austria and Germany (Figure 4) compared to the Eastern countries. First, Germany's spreads are distributed more evenly compared to Austria's ones. The volatility over different currencies is considerably higher in relative terms in Western Europe. The levels of spreads are lower compared to those in Eastern Europe indicating that

banks have different policies depending on the country of location.

The difference of spreads in two groups of countries is very large – spreads in Eastern Europe are clearly higher (Table 7) compared to spreads in Western country. Relative volatility is higher in Western countries when different currencies are compared. Higher relative volatility over currencies and considerably lower spreads in Western units of bank groups indicates that in-group policy rules in the West and in the East are different in the groups under study.

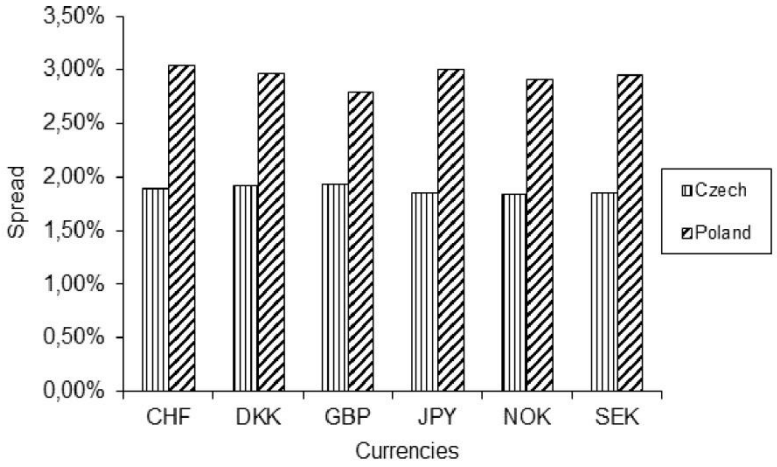

Figure 3. Averrage spreads in the sample from Czech Republic and Poland.

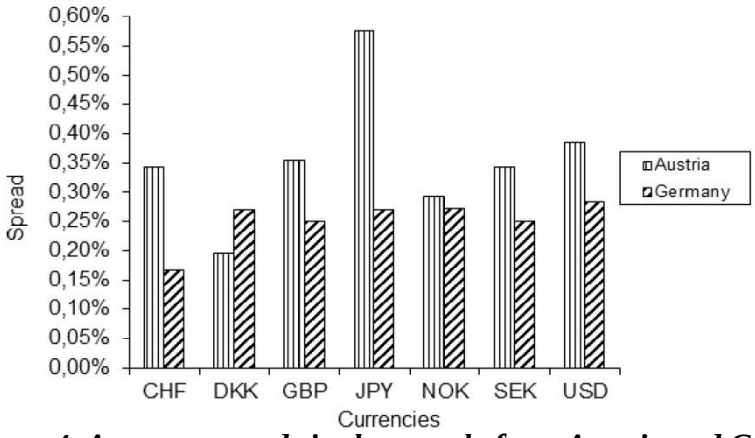

Figure 4. Average spreads in the sample from Austria and Germany.

	Czech Rep.	*Poland*	*Eastern Europe*	*Austria*	*Germany*	*Western Europe*
CHF	*1,890*	*3,047*	*2,469*	*0,343*	*0,167*	*0,255*
DKK	*1,924*	*2,957*	*2,441*	*0,195*	*0,270*	*0,233*
GBP	*1,926*	*2,794*	*2,360*	*0,354*	*0,252*	*0,303*
JPY	*1,846*	*2,998*	*2,422*	*0,578*	*0,271*	*0,424*
NOK	*1,843*	*2,914*	*2,378*	*0,293*	*0,274*	*0,283*
SEK	*1,849*	*2,955*	*2,402*	*0,343*	*0,251*	*0,297*
USD	*1,758*	*2,832*	*2,295*	*0,385*	*0,284*	*0,335*

Table 7. Average spreads from ECB currency rates in Eastern and Western Europe sample banks (January-March 2010, %).

Conclusions

The aim of this paper was to compare the behaviour toward the customers of different banking groups having businness in Eastern and Western Europe. In the case of full integration of the market customers of baanks should get similar services with similar pricces not depending on which part of market (country) they are located. As the bases for comparison the retail currency exchange rate spreads were used.

Under the constraint of data availability a symmetric sample of four countries (Austria, Czech Republic, Germany and Poland) and of four international banking groups (Unicredit, Erste, Commerzbank and Raiffeisen) having business at least in two countries of the sample was formed with the headquarters located in Western Europe in all cases.

The average retail currency exchange rate spreads were compared among the banking units and countries to study the banks' units' behavioural patterns. The retail currency spreads should be same in all parts of the market in the case of fully integrated markets. If the spreads are different, the price discrimination is most probably the reason.

Main results of the study were following:

In-country comparison of the banking units showed that the pattern of spreads belonging to different MNC-s (banking groups) was similar inside the countries. The statistically significant differences existed in most but not in all cases of currency-country pairs;

1 In-group comparison of retail currency spreads showed that banking groups offer more favourable terms to their Western customers (the spreads in Western banking units were lower compared to their Eastern counterparts). In all cases the differences of spreads were statistically significant and larger compared to in-country differences;
2 The spreads in Western banking units seem to be based on discretion and in Eastern banking units the decision making seems to be rule based over the currencies; considerable differences in volatility over currencies in East and West are bases of this conclusion;
3 The comparison of the aggregated data by countries showed that the differences of spreads in banking groups under study were more different between the Western-Eastern country pairs compared to Eastern-Eastern and Western-Western pairs.
4 Differences in currency exchange rate spreads between Eastern and Western Europe within chosen countries are very significant. It was found that exchange rates in Western Europe are more favourable for all analysed currencies in the case of all analysed banks.
5 One currency (DKK) can be considered as outlier in this study for unknown reasons.

The results of pilot study are contradicting to the assumption made in currency market microstructure literature (Rime, 2003) that monopoly power should be excluded as a factor determining the spreads. The results show that the assumption is most probably not correct in case of retail currency market and the theory should be improved to fit the reality of retail markets.

All results of the pilot study indicate that commercial banks' in-group policies may be discriminatory and the integration of banking markets at least in retail currency exchange area is not achieved.

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