

Are Banking Fees and Commissions Determined Arbitrarily?

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Abstract

The raising competition that induced sharp decline in profitability of traditional intermediation activity and new pricing strategies for connecting interest and non-interest income increase the importance of the fees and commissions. In this respect, because fees and commissions are generally used as a complement of other transactions, it is discussed whether their prices are determined independently from their costs and thus determined arbitrarily or not. Using the European Banking data for the period between 2011 and 2016, this study analysis the factors affecting the fees and commission prices by considering the effect of fees and commissions costs and their relationship with other income components. The results show that fees and commissions expenditure is significant in explaining fees and commission revenue. Also, there is a negative link between fees and commissions revenue and interest income, while it is positively associated with trading income.

Keywords: Banking fees and commissions, Income diversification, European Banking

Article History: Received 2 July 2017; Received in revised form 14 September 2017; Accepted 24 September 2017

1. Introduction

Increasing competition in traditional side of the banking sector reduced the profitability of the interest earning activity. Along with increasing competition, deregulations and liberalization changed the structure of the European banking sector. Banks were allowed to engage in non-interest income activities by the 1988 Second Banking Coordination Directive in Europe. These non-interest income activities include but not limited to insurance, securities business, and factoring. This decision allowed banks to also compete with one another in the area of non-traditional income. Banks reacted to the decreasing profitability and liberalization by seeking conditions under which they can diversify their income. In this respect, European banks searched alternative income sources and switched from traditional income sources to fees and commission, and trading activities. This long-run movement away from traditional income sources was made possible by myriad innovations in information, communications and financial technologies.

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After finding alternative income sources, the share of the non-interest income in banks' total income (net interest income plus non-interest income) has increased from 25% to 43% for commercial banks in the United States over the period 1984 - 2001 (Stiroh, 2004). The same ratio increased from 26% to 41% for commercial banks in the Europe during the period 1989 - 1998 (Lepetit et al., 2008b). Increasing share of the fees and commissions income forms a basis for a new discussion. Customers are unsatisfactory about fees and commissions charged. The various kinds of fee activities charged from customers are criticized as arbitrary bank implementation, probably, since cost side of the fees and commissions are not seen clearly. They think that fee charges are unfairly high and always increasing, even the fact that many customers are adopting low-cost electronic banking. Moreover, the number of the cases that fees and commissions charged is continuously increasing and mostly deceptive. Therefore, customers generally evaluate the fees and commissions as the arbitrary income source. This evaluation even affects bank selection. Devlin (2002) finds that high knowledge groups prioritize rate of return, service features and low fees in their bank selection. Likewise, Devlin and Gerrard (2005) find that service expectation, low fees and overdraft charges are more important in main bank selection, rather than secondary banks. Moreover, banks also charged fees and commissions from loan activities as well. They reduce the loan price and charge many fees and commissions from loan activities usually by benefiting from customers' are being less informed. This increasing trend also contributed to raising complaint about fees and commissions charged and customers question the arbitrariness of fee pricing to compensate the lower loan prices.

These discussed fees and commissions are important for banks particularly in terms of income diversification. Banks have a chance to diversify their risk by shifting their activities towards non-interest income side and defend themselves against unexpected shocks. However, diversification is beneficial if fees and commissions are negatively correlated, unrelated or positively but limitedly correlated with interest income. Otherwise, any shock to one of the income components affects other income components and therefore banks may not benefit from income diversification. The studies in the literature find that increases in fee income are accompanied by increased variability in profits and worsening in bank risk-return trade-off (DeYoung and Rice, 2004; Laeven and Levine, 2007; Lepetit et al., 2008). Other recent studies, such as Lepetit et al. (2008) and, Schmid and Walter (2009) find that bank income diversification is value reducing among European banks. Therefore, analyzing the fees and commissions income and their relationship with other income components is crucial for bank performance. Moreover, analyzing the relationship between fees and commissions costs and revenues help us to understand the basis of the customer complaints mentioned above. It is therefore of great interest to explore how fees and

commission costs and other income components affect the evolution of fees and commissions revenue.

Using European banking data for the period between 2011 and 2016, this study analysis determinants of fees and commissions revenue to understand the relationship between banks various income components. There are a limited number of empirical studies on determinants of bank fees. The main difficulty is reaching to the consistent data series for fees which are rarely available. Recently, Bankscope database started to publish details of the fees and commissions income, including fees and commission revenue and expense. To my best of knowledge, this study is the first to analysis the cost-revenue relationship of fees and commission. Results indicate that fees and commission expenditure is significant to explain fees and commission revenue. Thus, fees and commission charged from customers are dependent on the cost associated with it. The results also show that fees and commission income is negatively associated with interest income. However, it is positively associated with trading income. In line with a potential bundling strategy, these opposite associations suggest that banks maybe compensating reduced loan revenues by fees and commissions.

The rest of the paper is organized as follows: Section 2 reviews the relevant literature on fees and commission income. Section 3 outlines the methodology for estimations and defines the variables used in the empirical investigation. Section 4 describes the data used in this study. Section 5 develops the empirical results and analysis them. Section 6 concludes.

2. Literature Review

The number of the studies on fees and commission revenue in the literature is very limited. There are only a few studies focus on the determinants of the fees and commission income. Hannan (2006) examines the determinants of deposit-related retail banking fees for US banking using a set of survey data. Dvorak and Hanousek (2009) examine the determinants of retail bank fees in five Central European countries. They find that basic fee service is used as a loss leader for cross-subsidization. Tennant and Sutherland (2014) identify the characteristics of banks which profit the most from fees charged per dollar of deposits mobilized. They find that the banks which tend to profit most from fees are large and operate in more than one market. Banks earn profit heavily from fee activities tend to be well-managed institutions and more efficient. In this vein, one strand of the literature examines the relationship between income components without examining the determinants of fees and commission income. Stiroh (2004) finds that the correlation between margins and fees has increased over time. Carbo and Fernandez (2007) find that net interest margin and fees and commission income are negatively associated for the European banking system. Similarly, Lepetit et al. (2008b) find that higher income share from commissions and

fees is related with lower margins. Their results also suggest that the higher the commission and fee income share, the weaker the relationship between bank loan spreads and loan risk. The negative relationship between fees and commission and interest income is also found by Maudos and Solis (2009) for the Mexican banking system.

Some studies theoretically analysis the relationship between fees and commission income and interest income. Carbo and Fernandez (2007) theoretically analysis the relationship between fees and commission and interest income by extending the seminal model of Ho and Saunders (1981). In their study, they assume these two income components as substitute products. Authors theoretically find that interest income and fees and commissions are negatively associated.

Another strand of the literature examines the effect of the diversification on banking performance. DeYoung and Roland (2001) report that replacing lending activities with fee-based activities is related with both higher revenue volatility and higher total leverage. Some other studies find that increases in share of fees in total income are associated with a worsening of the bank's risk-return trade-off and increased profit volatility (DeYoung and Rice, 2004; Stiroh and Rumble, 2006). Stiroh and Rumble (2006) imply the fee generating activities as the reason of increasing risk with diversification. According to the results, fee generating activities are much more volatile than interest-generating activities. Baele et al. (2007) find that European banks with higher levels of fees have higher expected returns. However, European banks with higher levels of fees have higher beta risk, too.

3. Methodology and variables

3.1. Methodology

This study estimates a regression model of the fees and commission revenue. The fixed effects model is used in estimations rather than the random effect model in order to capture the influence of specific variables of each bank by considering country differences. As an additional check on the model, estimations are also made by dynamic model: the System GMM. Some potential problems that require using The System GMM model are

- The current realizations of the dependent variable, fees and commissions revenue, may be determined by lag values.
- Some variables may be predetermined variables
- The idiosyncratic disturbances may have specific patterns of serial correlation and heteroscedasticity

By considering these potential issues, the system GMM with Windmeijer (2005) corrected standard errors methodology proposed by Arellano and Bover (1995) and, Blundell and Bond (1998), estimating a system of equations in both first-differences and levels are also used. To test the validity of the model, a Hansen over-identifying test and second-order serial correlation of the first difference residuals will be reported.

3.2. Variables

3.2.1. Dependent Variable

Fee revenue: Fee revenue is measured by fees and commissions revenue over total assets. Bankscope database no longer publishes only net fees and commission income. Now, both fees and commission revenue and fees and commission expenditure are published together. Therefore, to my knowledge, this is the first study that analysis the relationship between fees and commission revenue and cost.

3.2.2. Explanatory Variables

3.2.2.1. Bank specific explanatory variables

Fee expenditure: Fee expenditure is calculated as fees and commissions expenditures over total assets. This variable is introduced to understand whether fees and commission prices are determined independently from costs. Generally, high fees and commissions are assumed arbitrary bank policy to cover the losses from other income statement components.

Credit risk: Credit risk is proxied by loan loss provision over total loans. Banks may compensate the non-performing loans by charging higher fees and commissions. Therefore, a negative relationship is priori expected.

Risk aversion: The degree of risk aversion is proxied by the ratio of equity to total assets. By the increase in fees and commissions, banks keep less equity to buffer against losses.

Interest Income: It is employed to see the effect of interest income on fee income by considering charging fees and commissions from loan activities. Bank may charge higher fees and commissions by reducing loan price to attract loan customers. Some studies find a negative relationship between fees and commission and interest income (Carbo and Fernandez, 2007; Lepetit et al., 2008b; Maudos and Solis, 2009).

Staff costs: Staff costs are proxied by staff expense over total asset. Banks may cover staff costs by increasing fees and commissions.

Trading income: Trading income is calculated by non-interest income minus fees and commissions to asset ratio. After increasing share of the insurance income in income statements of the banks, Bankscope database generally publishes insurance income separately from fees and commission income. Therefore, trading income reflects

the effect of insurance income. Bundling policy of the banks may connect interest income, fees and commissions and trade income.

Asset size: Asset size implies the bank size. Increasing bank size may affect fees and commission income with diverse fee products. It is calculated as the logarithm of total assets.

Loan specialization: Loan specialization is proxied as a quotient between total loans and total assets. Because banks charge different kinds of fees and commissions from loan activities, specialization on loans may significantly affect fees and commission revenue.

The quality of the management: The quality of the management is measured by bank efficiency. It is proxied by the cost to gross income ratio. Because low levels of operating cost per unit of gross income imply banks that are more efficient in their management, they may reduce their fees and commissions price.

3.2.2.2. Sectoral explanatory variables

Bank competition: To proxy the competitive structure of the European banking market, Herfindahl Hirschman Index (HHI) will be used. Index is the sum of the squares of the bank market shares and market shares are measured by banks' total assets. Competition is assumed on a national scale. Increasing competition, particularly in the loan competition side, may lead banks to compensate from fees and commission side to increase profitability. On the other hand, raising competition, not loan competition but general competition, may lead banks to even decrease fees and commission prices. Therefore, the competition may increase or decrease banks' fees and commission revenue depending on being dominant of one side.

Sectoral Development: Sectoral development is proxied by total banking assets over GDP. Positive association is priori expected since sectoral development may also increase the demand of activities that require fees and commissions.

Non-interest Income Development: Increase in the non-interest product sector, by innovation or technological improvement, may increase the fees and commissions. Variable is calculated by total non-interest income of the banking sector over GDP.

3.2.2.3. Macroeconomic variables

GDP growth: Increase in the GDP, which implies increase in welfare, may increase the fees and commissions charged. Similar to the sectoral development, increase in GDP growth increases the welfare of the bank customers. Customers' demand for fee and commission services may increase by increasing welfare.

Regulatory Efficiency: Considering the regulatory differences in countries, the Heritage Foundation Freedom Index of regulation is also tested.

4. Data

Annually banking data are compiled from the Bureau Van Dijk's Bankscope Database. Some macroeconomic data come from World Development Indicators, World bank. Unconsolidated commercial bank financial data is used but in the absence of unconsolidated data, bank's consolidated data were added. The sample used is formed by an unbalanced panel of data from 2472 annual observations, corresponding to 660 commercial banks for the period between 2011 and 2016. Sample used in this analysis is less than the actual total number of observations but considered representativeness of sample. All bank values are dollar values and were deflated by the gross domestic product deflator of each country. Sample consist fifteen European countries including Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the UK. Some of the criteria used in filtering are

- missing years from explanatory variables and independent variable were eliminated
- available bank data which are less than 3 years in a row were eliminated for potential econometric problems in calculation
- abnormal values of variables were also eliminated

5. Sample and Results

Table 1 presents the descriptive statistics. Estimations in Table 2 are estimated with static models. The most general scenario is estimated in the first column. The effects of sectoral development, loan specialization, development of non-traditional income activities, efficiency and regulatory efficiency are controlled in the following columns. The models are also estimated introducing the System GMM model in Table 3.

Descriptive statistics in Table 1 show that fees and commission revenue increased until 2015, but then it has started a decreasing trend. On the other hand, fee expenditure is in downward trend. The main reason behind the decreasing fees and commission expenditure may be the improving technology over time. When other interest income components are considered, the share of the fees and commission revenue in total revenue has decreased except the year 2015. This downward trend is not seen in the fees and commission expenditure share. Other income component, interest income, has decreased while total loans has stable pattern for the period 2011-2016. Trade income, as the third income component, is in upward trend during this period. Competition and efficiency parameters seem to move together but opposite direction. From 2011 to 2014, while competition was increasing, efficiency of banks, interestingly, was decreasing. However, efficiencies have increased for the years 2015 and 2016, when competition has decreased.

Table 1. Descriptive statistics

Year	FEEREV	FEEEXP	FEEREVSH	FEEEXPSH	LOANLOSS	LOANS	EQUITY	INTINCOME	STAFFEXP	TRADE	HHI	EFFICIENCY
2011 Mean	0,026	0,011	0,444	0,193	0,006	0,549	0,102	0,033	0,016	0,014	0,36	0,804
Std Dev	0,076	0,049	0,437	0,491	0,008	0,239	0,092	0,015	0,018	0,049	0,21	0,74
2012 Mean	0,028	0,011	0,426	0,2	0,008	0,525	0,103	0,032	0,017	0,014	0,357	0,774
Std Dev	0,084	0,052	0,409	0,484	0,012	0,241	0,094	0,016	0,024	0,052	0,204	0,586
2013 Mean	0,028	0,008	0,401	0,167	0,005	0,553	0,114	0,029	0,018	0,02	0,266	0,721
Std Dev	0,097	0,038	0,381	0,363	0,014	0,26	0,121	0,018	0,042	0,062	0,12	0,671
2014 Mean	0,032	0,009	0,378	0,165	0,005	0,552	0,113	0,028	0,02	0,02	0,269	0,651
Std Dev	0,165	0,052	0,692	0,378	0,015	0,257	0,107	0,018	0,077	0,079	0,122	2,381
2015 Mean	0,023	0,007	0,403	0,18	0,005	0,56	0,114	0,026	0,015	0,021	0,258	0,64
Std Dev	0,064	0,035	0,392	0,448	0,014	0,256	0,106	0,018	0,019	0,08	0,111	2,917
2016 Mean	0,016	0,005	0,374	0,164	0,003	0,574	0,106	0,024	0,012	0,019	0,294	0,686
Std Dev	0,042	0,027	0,363	0,41	0,009	0,244	0,088	0,018	0,011	0,038	0,124	0,343

FEEREV: Fees and commission revenue over total assets, FEEEXP: Fees and commission expense over total assets, FEEREVSH: Fees and commission revenue over operating revenue
 FEEEXPSH: Fees and commission revenue over operating expenses, LOANLOSS: Loan loss provision over total loans, LOANS: Total loans over total assets, EQUITY: Total equity
 over total assets, INTINCOME: Net interest income over total assets, STAFFEXP: Staff costs over total assets, TRADE: Total non-interest income minus net fees and commission
 income over total assets HHI: Herfindahl Hirschman Index EFFICIENCY: Cost to gross income ratio

For the regression results in Table 2, in all cases, the signs of the coefficients of the fees and commission expenditure are positive and significant at 1%, reflecting the fact that fees and commissions expense and, fees and commissions revenue are positively associated. Increase in fees and commission expenditure raises the fees and commission revenue. Even this seems to be normal by its very nature, customer critics on fees and commissions do not provide a background to claim that banks independently determine their fees and commissions prices from their costs. Results suggest that costs impact the fees and commissions charged from customers and they are not arbitrary.

Results also indicate that the coefficients of the interest income are significant and negative. The main reason behind the negative association is the charged fees and commissions from loan activities. Banks cut their loan price to attract customers, whom they can exploit from the fees and commission side with higher prices. Thus, higher reliance on fee-based activities is associated with lower lending rates. From similar perspective, there is a positive relationship between trade income and, fees and commissions. Trade income includes some insurance income which is separated from fees and commissions. In recent years, the share of the insurance income has increased. The higher and increasing share of the insurance income leads to publishing it separately. Insurance income has complementary characteristics when considering loan activities. Banks generally sell loan and its complements together and charge fees and commissions from this activity which is called bundling strategy. Insurance for mortgage or travel insurance are some of the examples of insurance that act as a complementary product. Therefore, banks connect loan, fee and insurance activities by bundling. While banks are lowering their loan price, they are charging higher fees and commissions as well as higher insurance commission. This strategy creates a positive link between trading (or in here, complementary product) and, fees and commissions revenue. According to the results, there is a positive association between bank staff expenditure and, fees and commission revenue. Banks reflect their staff costs to the fees and commission prices. Similarly another cost parameter, loan loss provision, also positively affects fees and commission revenue.

Losses from the interest income are compensated by charging fees and commissions. Thus, fees and commission expenditure, lower interest price, loan loss provision and staff costs, as four different banking losses, increase the fees and commission prices. The negative and significant relationship between equity and, fees and commission revenue implies that banks evaluate increasing fees and commissions as less risky situation. They react to this less risky situation by reducing their equity.

Table 2. Determinants of fees and commission revenue – Static model

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dep Variable	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV
FEEEXP	1.458*** (0.0385)	1.458*** (0.0385)	1.457*** (0.0385)	1.457*** (0.0385)	1.456*** (0.0385)	1.457*** (0.0385)
LOANLOSS	0.0788*** (0.0235)	0.0790*** (0.0236)	0.0788*** (0.0235)	0.0783*** (0.0235)	0.0767*** (0.0235)	0.0757*** (0.0235)
EQUITY	-0.0598*** (0.00625)	-0.0598*** (0.00625)	-0.0608*** (0.00629)	-0.0590*** (0.00629)	-0.0598*** (0.00624)	-0.0598*** (0.00624)
INTINCOME	-0.200*** (0.0410)	-0.199*** (0.0418)	-0.183*** (0.0426)	-0.201*** (0.0410)	-0.200*** (0.0409)	-0.206*** (0.0410)
STAFFEXP	1.161*** (0.0147)	1.161*** (0.0147)	1.163*** (0.0148)	1.161*** (0.0147)	1.162*** (0.0147)	1.162*** (0.0147)
TRADE	0.315*** (0.0223)	0.314*** (0.0223)	0.314*** (0.0223)	0.315*** (0.0223)	0.315*** (0.0222)	0.315*** (0.0222)
HHI	0.00327 (0.00323)	0.00321 (0.00325)	0.00284 (0.00324)	0.00432 (0.00336)	0.00339 (0.00323)	0.00311 (0.00323)
GDPGROWTH	0.000149 (0.000209)	0.000141 (0.000217)	0.000167 (0.000209)	0.000207 (0.000215)	0.000148 (0.000208)	0.000107 (0.000209)
LNASSET	0.000887 (0.000763)	0.000881 (0.000765)	0.000782 (0.000767)	0.00108 (0.000782)	0.000877 (0.000763)	0.000883 (0.000763)
ASSETGDP		-1.04e-07 (7.02e-07)				
LOANS			-0.00587 (0.00420)			
NONOPERINCGDP				5.29e-05 (4.69e-05)		
EFFICIENCY					-0.000259* (0.000133)	
REGULATION						0.0382** (0.0172)
Constant	-0.0133 (0.0115)	-0.0129 (0.0118)	-0.00879 (0.0120)	-0.0179 (0.0123)	-0.0130 (0.0115)	-0.0417** (0.0172)
Observations	2,451	2,451	2,451	2,451	2,451	2,451
R-squared	0.884	0.884	0.885	0.885	0.885	0.885
Number of id	651	651	651	651	651	651

FEEREV: Fees and commission revenue over total assets, FEEEXP: Fees and commission expense over total assets, LOANLOSS: Loan loss provision over total loans, EQUITY: Total equity over total assets, INTINCOME: Net interest income over total assets, STAFFEXP: Staff costs over total assets, TRADE: Total non- interest income minus net fees and commission income over total assets HHI: Herfindahl Hirschman Index, GDPGROWTH: Annually GDP growth of each country, LNASSET, logarithm of total assets, ASSETGDP: Total banking assets over GDP, LOANS: Total loans over total assets, NONOPERINCGDP: Non-operating income over GDP, EFFICIENCY: Cost to gross income ration, REGULATION: Regulatory efficiency index

***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Standard errors in parentheses.

Table 3. Determinants of fees and commission revenue – Dynamic model

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dep Variable	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV
LFEEREV	0.317** (0.149)	0.329** (0.151)	0.336** (0.145)	0.322** (0.149)	0.317** (0.147)	0.331** (0.153)
FEEEXP	1.658*** (0.213)	1.636*** (0.218)	1.404*** (0.151)	1.662*** (0.207)	1.664*** (0.212)	1.615*** (0.205)
LOANLOSS	0.0589 (0.273)	0.0680 (0.282)	-0.125 (0.0850)	0.0344 (0.277)	0.0342 (0.259)	0.0588 (0.281)
EQUITY	-0.105** (0.0493)	-0.0994** (0.0483)	-0.0945*** (0.0317)	-0.103** (0.0499)	-0.106** (0.0503)	-0.100** (0.0461)
INTINCOME	-0.479*** (0.171)	-0.485** (0.196)	-0.271** (0.122)	-0.396* (0.203)	-0.456*** (0.146)	-0.421*** (0.131)
STAFFEXP	1.038*** (0.245)	1.016*** (0.250)	1.427*** (0.135)	1.033*** (0.251)	1.047*** (0.246)	1.027*** (0.243)
TRADE	0.815*** (0.183)	0.802*** (0.185)	0.563*** (0.125)	0.822*** (0.190)	0.822*** (0.186)	0.785*** (0.176)
HHI	0.000780 (0.00540)	0.000904 (0.00509)	-0.00306 (0.00392)	0.00121 (0.00411)	0.000377 (0.00418)	-0.00109 (0.00403)
GDPGROWTH	-0.000260 (0.000542)	-0.000167 (0.000550)	-0.000198 (0.000351)	-5.44e-05 (0.000567)	-0.000275 (0.000533)	-0.000211 (0.000561)
LNASSET	0.000688* (0.000394)	0.000787* (0.000409)	0.00159*** (0.000550)	0.000879** (0.000424)	0.000753** (0.000364)	0.000954** (0.000420)
ASSETGDP		2.70e-07 (4.17e-07)				
LOANS			0.0337* (0.0197)			
NONOPERINCGDP				4.08e-05 (3.40e-05)		
EFFICIENCY					-0.000623* (0.000348)	
REGULATION						0.0163 (0.0170)
Constant	-0.0119 (0.0101)	-0.0140 (0.0116)	-0.0492** (0.0227)	-0.0187 (0.0132)	-0.0130 (0.00924)	-0.0293* (0.0176)
Observations	1,793	1,793	1,793	1,793	1,793	1,793
Number of id	602	602	602	602	602	602
Hansen Test P	0.269	0.152	0.781	0.557	0.254	0.354
AR(2)	0.720	0.745	0.753	0.742	0.736	0.746

FEEREV: Fees and commission revenue over total assets, LFEEREV: Lag value of fees and commission revenue over total assets, FEEEXP: Fees and commission expense over total assets, LOANLOSS: Loan loss provision over total loans, EQUITY: Total equity over total assets, INTINCOME: Net interest income over total assets, STAFFEXP: Staff costs over total assets, TRADE: Total non-interest income minus net fees and commission income over total assets HHI: Herfindahl Hirschman Index, GDPGROWTH: Annually GDP growth of each country, LNASSET, logarithm of total assets, ASSETGDP: Total banking assets over GDP, LOANS: Total loans over total assets, NONOPERINCGDP: Non-operating income over GDP, EFFICIENCY: Cost to gross income ration, REGULATION: Regulatory efficiency index

***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Standard errors in parentheses.

Table 4. Determinants of fees and commission revenue – Static model – Big six

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dep Variable	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV
FEEEXP	1.588*** (0.0506)	1.588*** (0.0506)	1.584*** (0.0506)	1.586*** (0.0506)	1.586*** (0.0506)	1.585*** (0.0505)
LOANLOSS	0.133*** (0.0324)	0.132*** (0.0324)	0.137*** (0.0324)	0.132*** (0.0324)	0.131*** (0.0324)	0.130*** (0.0324)
EQUITY	-0.0691*** (0.00834)	-0.0689*** (0.00834)	-0.0713*** (0.00841)	-0.0681*** (0.00842)	-0.0694*** (0.00833)	-0.0691*** (0.00832)
INTINCOME	-0.256*** (0.0558)	-0.260*** (0.0561)	-0.220*** (0.0587)	-0.257*** (0.0558)	-0.255*** (0.0558)	-0.265*** (0.0559)
STAFFEXP	1.152*** (0.0170)	1.152*** (0.0170)	1.156*** (0.0171)	1.152*** (0.0170)	1.153*** (0.0170)	1.153*** (0.0170)
TRADE	0.347*** (0.0258)	0.348*** (0.0259)	0.346*** (0.0258)	0.348*** (0.0258)	0.348*** (0.0258)	0.348*** (0.0258)
HHI	0.00156 (0.00383)	0.00175 (0.00384)	0.000915 (0.00384)	0.00238 (0.00396)	0.00165 (0.00383)	0.00123 (0.00383)
GDPGROWTH	-4.19e-05 (0.000278)	1.19e-06 (0.000287)	-1.64e-05 (0.000278)	9.94e-06 (0.000285)	-4.17e-05 (0.000277)	-9.26e-05 (0.000278)
LNASSET	0.000359 (0.00104)	0.000420 (0.00105)	0.000126 (0.00105)	0.000613 (0.00109)	0.000346 (0.00104)	0.000396 (0.00104)
ASSETGDP		5.62e-07 (9.38e-07)				
LOANS			-0.0106* (0.00540)			
NONOPERINCGDP				4.58e-05 (5.55e-05)		
EFFICIENCY					-0.000231 (0.000154)	
REGULATION						0.0453** (0.0215)
Constant	-0.00468 (0.0159)	-0.00703 (0.0163)	0.00376 (0.0164)	-0.0103 (0.0173)	-0.00434 (0.0159)	-0.0381* (0.0224)
Observations	1,658	1,658	1,658	1,658	1,658	1,658
R-squared	0.900	0.900	0.900	0.900	0.900	0.900
Number of id	439	439	439	439	439	439

FEEREV: Fees and commission revenue over total assets, FEEEXP: Fees and commission expense over total assets, LOANLOSS: Loan loss provision over total loans, EQUITY: Total equity over total assets, INTINCOME: Net interest income over total assets, STAFFEXP: Staff costs over total assets, TRADE: Total non- interest income minus net fees and commission income over total assets HHI: Herfindahl Hirschman Index, GDPGROWTH: Annually GDP growth of each country, LNASSET, logarithm of total assets, ASSETGDP: Total banking assets over GDP, LOANS: Total loans over total assets, NONOPERINCGDP: Non-operating income over GDP, EFFICIENCY: Cost to gross income ration, REGULATION: Regulatory efficiency index

***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Standard errors in parentheses.

**Table 5. Determinants of fees and commission revenue –
Dynamic model – Big Six**

VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Dep Variable	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV	FEEREV
LFEEREV	0.441** (0.208)	0.537** (0.251)	0.399** (0.191)	0.444** (0.210)	0.504** (0.240)	0.476** (0.238)
FEEEXP	1.106*** (0.291)	0.977** (0.429)	1.344*** (0.222)	1.108*** (0.291)	1.128** (0.436)	1.296*** (0.437)
LOANLOSS	-0.122 (0.244)	-0.0987 (0.185)	-0.266 (0.199)	-0.127 (0.246)	-0.220 (0.255)	-0.0396 (0.156)
EQUITY	-0.144*** (0.0557)	-0.142*** (0.0503)	-0.126** (0.0493)	-0.143*** (0.0532)	-0.165** (0.0649)	-0.147** (0.0628)
INTINCOME	-0.398** (0.161)	-0.484*** (0.180)	-0.411** (0.207)	-0.390** (0.180)	-0.395** (0.185)	-0.557** (0.234)
STAFFEXP	1.442*** (0.256)	1.378*** (0.224)	1.439*** (0.168)	1.440*** (0.241)	1.470*** (0.256)	1.291*** (0.234)
TRADE	0.466*** (0.176)	0.460** (0.228)	0.611*** (0.154)	0.472*** (0.182)	0.577** (0.240)	0.680** (0.277)
HHI	-0.00891 (0.0155)	-0.00566 (0.00682)	-0.0114 (0.0121)	-0.00903 (0.0190)	-0.00684 (0.0115)	-0.00752 (0.0101)
GDPGROWTH	-0.000202 (0.000581)	-0.000134 (0.000569)	-0.000226 (0.000706)	-0.000171 (0.000575)	-0.000505 (0.000597)	-0.000714 (0.000584)
LNASSET	0.000608 (0.000502)	0.000443 (0.000457)	0.00159** (0.000675)	0.000681 (0.000539)	0.000863 (0.000622)	0.000851 (0.000532)
ASSETGDP		1.66e-07 (6.15e-07)				
LOANS			0.0345* (0.0181)			
NONOPERINCGRP				2.91e-05 (2.77e-05)		
EFFICIENCY					-0.000550* (0.000284)	
REGULATION						0.0279* (0.0161)
Constant	-0.00495 (0.0106)	-0.00155 (0.0106)	-0.0428* (0.0252)	-0.00743 (0.0120)	-0.0101 (0.0130)	-0.0285 (0.0182)
Observations	1,213	1,213	1,213	1,213	1,213	1,213
Number of id	407	407	407	407	407	407
Hansen Test P	0.221	0.130	0.244	0.254	0.522	0.447
AR(2)	0.770	0.570	0.737	0.756	0.494	0.733

FEEREV: Fees and commission revenue over total assets, LFEEREV: Lag value of fees and commission revenue over total assets, FEEEXP: Fees and commission expense over total assets, LOANLOSS: Loan loss provision over total loans, EQUITY: Total equity over total assets, INTINCOME: Net interest income over total assets, STAFFEXP: Staff costs over total assets, TRADE: Total non-interest income minus net fees and commission income over total assets HHI: Herfindahl Hirschman Index, GDPGROWTH: Annually GDP growth of each country, LNASSET, logarithm of total assets, ASSETGDP: Total banking assets over GDP, LOANS: Total loans over total assets, NONOPERINCGRP: Non-operating income over GDP, EFFICIENCY: Cost to gross income ration, REGULATION: Regulatory efficiency index

***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Standard errors in parentheses.

The competitive structure of the banking market is statistically insignificant to explain fees and commission revenue. GDP growth, development of banking sector and non-interest income activities are also statistically insignificant for fees and commissions revenue. However, increase in efficiency reduces the fees and commission income. Banks reduce their fees and commission by increasing quality of management. On the other hand, regulatory efficiency of country increases the fees and commission revenue. However, regulatory efficiency is statistically insignificant in dynamic model.

Table 3 presents the dynamic model estimations. Compared to static model, loan loss provision is statistically insignificant in explaining fees and commission revenue. The new explanatory variable, lag value of fees and commission revenue, is statistically significant and positively associated with current fees and commission revenue.

This study also tests the determinants of fees and commission revenue for big European countries by dropping the small countries in the sample, too. The countries in the sample are France, Germany, Italy, Spain, Switzerland and the United Kingdom. Table 4 and 5 show the estimation results by using the Fixed Effect and The System GMM models, respectively. Compared to Table 2 and Table 3, there is no any big differences. Asset size is no longer statistically significant in the System GMM model. However, regulatory efficiency is now statistically significant for the System GMM Model and positively affects fees and commission revenue as it is seen in Table 2 regression results.

6. Conclusion

Increasing competition in traditional banking side leads banks to compete in non-traditional side. The share of the fess and commission income in total income has increased dramatically in this process. However customer complaints arise from this increase in fees and commissions charged. Charged fees and commissions are generally evaluated as arbitrary implementation of the banks and not associated with the costs related with fees and commissions. The objective of this study was to analysis the relationship between fees and commission revenue and costs, as well as other factors that may affect fees and commissions revenue in the European banking industry. In addition to fee cost and revenue issues addressed, this study also tests for a possible cross-selling behavior of interest and non-interest products.

The empirical models show that fees and commission revenue is dependent on the costs associated with it. Increase in fees and commissions costs increases the fees and commission prices. Similar to fees and commissions costs, other important bank costs are also increases the fees and commissions prices. Staff costs and loan losses (from bad loans, customer defaults and renegotiated loans from lower rate), also increase the fees and commission prices.

Lowering interest rate to attract loan customers, as another assumed cost factor, also increases the fees and commissions. Banks compensate the lowering loan price by charging higher fees and commissions from loan activity. Generally banks implement price bundling strategy such that they motivated themselves to sell interest and non-interest products together. In this vein, they lower loan price and increase the price of fees and commissions and other complement products. This strategy creates a bridge between fees and commission income and trading income. This study finds a positive relationship between these two income components.

Increase in fees and commission revenue helps banks to reduce their equity level. By diversifying the income components, banks do not have to keep higher amount equity for loan activities.

From an economic policy orientation, the results reported in this study help us to conclude that increasing pressure on politicians and banking sector participants about fee prices' arbitrariness is not the real story. Regulators should consider the cost side of the fees and commission price and overall bank risk against shocks, especially considering the relationship between income components. Cross-selling policies of the banks may end with lower bank performance.

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