C Adapting bank business models: financial stability implications of greater reliance on fee and commission income[139]

The euro area banking sector is faced with cyclical and structural challenges, which are hampering many banks' ability to generate sustainable profits. In particular, the prolonged period of low nominal growth and low yields compresses net interest income, which traditionally has been (and still is) euro area banks' main source of income. One way for banks to compensate for compressed net interest margins could be to adapt their business models, moving towards more fee and commission-generating activities. This article discusses the challenges involved in boosting fee and commission income and highlights some of the potential financial stability implications related to a greater reliance on these income sources.

Introduction

Banks' business models are currently under substantial pressure and in need of reinvention to create sustainable ways of generating profits in a post-crisis environment.[140] These challenges may reflect factors of both a structural and cyclical nature.[141] Structural impediments to profit generation include low cost-efficiency and strong competition in many banking sectors in the euro area. Regarding cyclical factors, the current environment of low nominal growth and low short-term and long-term interest rates restrains banks' ability to generate net interest income[142], typically the main income source for most euro area banks. Moreover, in some jurisdictions, pressure on bank profitability is compounded by high stocks of non-performing loans (NPLs) (see also Special Feature B in this issue of the FSR).

One important avenue for bank business model adaptation to the new economic and financial environment could be to enhance fee and commission-based activities. Such a shift could lead to more diversified income sources and thus help stabilise banks' capital generation as their ability to retain earnings would be less dependent on, for instance, net interest income. At the same time, it is not necessarily straightforward for banks to compensate for a decline in net interest income by increasing fees and commissions. It might be the case that for some banks the capacity to attract more fees and commissions is strongly interlinked with

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[139] This special feature was prepared by Christoffer Kok, Harun Mirza, Csaba Móré and Cosimo Pancaro.

[140] See, for example, the special feature by Kok, C., Móré, C. and Petrescu, M. entitled "Recent trends in euro area banks' business models and implications for banking sector stability", *Financial Stability Review*, ECB, May 2016.

[141] See, for example, the special feature by Kok, C., Móré, C. and Pancaro, C. entitled "Bank profitability challenges in euro area banks: the role of cyclical and structural factors", *Financial Stability Review*, ECB, May 2015. See also *Global Financial Stability Report*, IMF, October 2016.

[142] See, for example, the box entitled "Euro area banks' net interest margins and the low interest rate environment", *Financial Stability Review*, ECB, November 2015.

business activities from which they accumulate most of their net interest income.[143] Even if banks were able to markedly increase fee and commission (F&C) income[144], the higher degree of income diversification would not necessarily improve the stability and resilience of banks' overall net income. This would hinge on how resilient F&C income is to adverse developments in the macroeconomic and financial environment. Whether a shift to more fee and commission-generating activities is feasible and sustainable is likely to depend on the bank's specific business model and the type of F&C income it is equipped to generate.

This article discusses recent developments in banks' F&C income and highlights potential financial stability implications of an increased focus on F&C-generating activities. For this purpose, the article first reviews recent trends in F&C income, how they compare with developments in other income sources (net interest income, in particular) and what the euro area banks' main activities generating F&C income are and how this relates to their business model characteristics. Secondly, it empirically explores how resilient F&C income is to an adverse macro-financial scenario. This has clear financial stability implications depending on whether a stronger reliance on F&C income is more or less conducive to the stability of banks' earnings, in normal times and during stress periods. In this regard, it will be important to assess which are the most relevant macro-financial factors influencing F&C dynamics. Also, different types of bank business models may to varying degrees be exposed to specific F&C income sources and hence the resilience to shocks may differ across business models.

Recent trends in and main characteristics of euro area banks' fee and commission income

Since the financial crisis, fees and commissions have become an increasingly important income source for euro area banks, although this change has been only gradual so far. At the end of 2015, average F&C income of euro area banks reached close to 30% of total operating income (see Chart C.1). This development may reflect that banks' operating environment for the generation of other income sources, such as net interest income and trading income, has become more difficult in recent years due to a confluence of factors including the low level of interest rates, tighter regulatory requirements and subdued loan demand.

There are substantial differences in the degree to which banks rely on F&C income. Chart C.2 illustrates that the importance of F&C income differs markedly across broad types of business models. While the business model of custodian banks and asset managers is predominantly based on F&C-related activities, other types of banks produce fees and commissions in a range of 15% to 30% of total income. Corporate/wholesale lenders and specialised sectoral lenders (such as auto

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[143] In other words, this raises the question as to whether net interest income and F&C income are substitutes or complements? And if they are of a complementary nature, can banks transform their business model in order to substitute between the two?

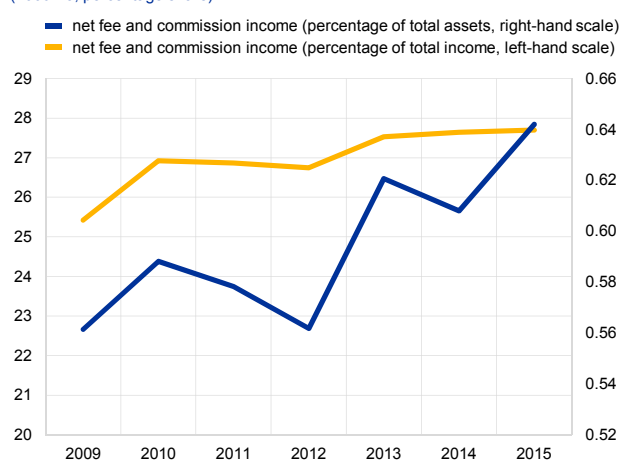[144] Unless explicitly stated, in this article F&C income refers to net fee and commission income.

and shipping financing companies) tend to have the smallest shares of F&C income, whereas universal banks and retail lenders report shares of around 25-30%. Overall, this could suggest that certain types of banks may be less well-equipped to markedly increase their F&C income due to specific characteristics of their business model (e.g. highly specialised lenders).

Chart C.1

Fees and commissions have become an increasingly important income source since the financial crisis

Euro area banks' net fee and commission income as a percentage of total assets and of total operating income

(2009-15, percentage share)

net fee and commission income (percentage of total assets, right-hand scale)
net fee and commission income (percentage of total income, left-hand scale)

Chart C.2

The share of fee and commission income in total income differs across bank business models

SSM significant institutions' net fee and commission income as a share of total income broken down by business model

(2015, percentage share)

Source: ECB consolidated banking data.
Note: The sample covers most of the euro area banking sector.
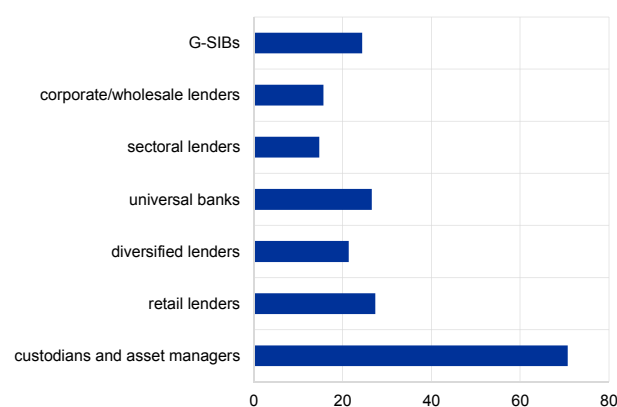
Sources: ECB and SNL.
Notes: The sample covers 94 SSM significant institutions. "Universal banks" also include global systemically important banks (G-SIBs) that are universal banks, while "G-SIBs" exclude those banks.

Bank F&C income is generated through a wide range of activities. Taking an activity-based perspective, Chart C.3 shows the breakdown of (gross) fee income by activity for Single Supervisory Mechanism (SSM) significant institutions as at end-2015. Payment services represented the largest single category in 2015 (18%), followed by asset management (15%), distributed investment products[145] (13%) and securities business (10%).[146] Other fee-generating activities include custody services, the provision of loan commitments and financial guarantees, clearing and settlement-related activities, and structured finance and securitisation transactions.

Looking at recent trends in the significant institutions' fee income by activity, growth of asset management and investment management-related fees accounted for around half of the total increase in (gross) fee income in 2015 (see Chart C.4). Security, payment service and custody-related fees also made positive contributions, while fees related to lending and other financing activities, including loan commitments, securitisation and structured finance, made either no or

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[145] These are mainly related to the sale of insurance products and shares in investment funds (other than those managed by the bank).

[146] It should be noted, however, that about one-quarter of total F&C income is categorised under "other" and hence cannot be attributed to specific activities.

a negative contribution to overall (gross) F&C income growth. In the first quarter of 2016, significant institutions' gross fee income dropped by around 3% year on year, with declines in security and loan commitment-related fees contributing the most. Due to net investment fund outflows in the first quarter of 2016, asset management fees made a small negative contribution. At the same time, payment service-related fees contributed positively to total fee income growth. Overall, these recent developments highlight the sensitivity of some important fee income sub-components to financial market and loan market conditions.

Chart C.3

Fee and commission income is generated from a wide range of activities

Breakdown of SSM significant institutions' (gross) fee and commission income
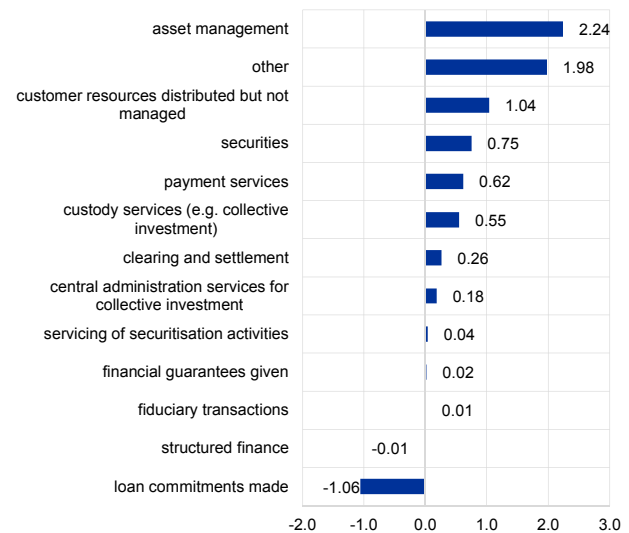
(2015, percentage share)
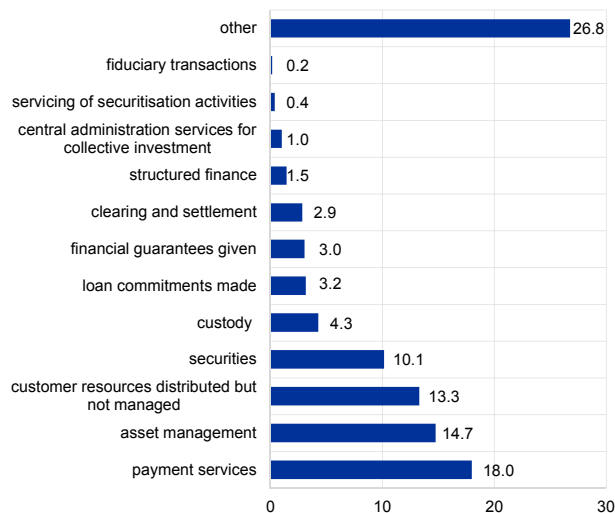
Chart C.4

Growth of fee and commission income in 2015 was mainly driven by custody and investment services

Contributions of fee income sub-components to the change in SSM significant institutions' (gross) fee and commission income in 2015

(2014-15, percentage points)

Source: ECB supervisory data.

Source: ECB supervisory data.

Could stronger reliance on F&C income compensate for lower net interest income? In view of the pressures on net interest margins due to the prolonged period of low yields, many banks might have sought to expand F&C-generating activities to compensate for the slowdown in net interest income (NII). However, the relationship between these two income items is not clear.

The correlation between NII growth and F&C income growth seems to be weakly positive for most SSM significant institutions. Chart C.5 illustrates that there has been a weak, but positive relationship between NII growth and net F&C income growth of euro area banks over the periods 2009-16 and 2012-16.[147] This would suggest some degree of complementarity between these two income sources, reflecting that they are driven by common factors such as economic growth, lending

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[147] The correlation coefficient between NII and F&C income growth is 0.43 in the 2009-15 period and 0.37 in the 2012-15 period. The sample covers 94 SSM significant institutions.

activity[148] and conditions in financial markets (see below for an empirical investigation into the main drivers of F&C income).

Chart C.5

Weak positive relationship between fee and commission income and net interest income suggests limited income source substitution

Changes in net interest income and net fee and commission income for SSM significant institutions

(x-axis: change in net interest income over total assets (in percentage points); y-axis: change in net fee and commission income over total assets (in percentage points))

- 2012-16 change
- 2009-16 change

R² = 0.18

R² = 0.14
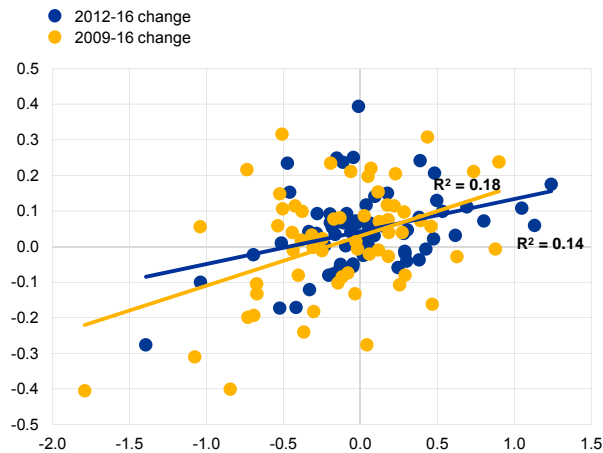
Sources: ECB and SNL.
Note: The last observation is for the first half of 2016.

Chart C.6

Banks' ability to compensate for low (or negative) net interest income growth also varied across business models

Changes in net interest income and net fee and commission income for SSM significant institutions broken down by business model

(percentage point change in net interest income over total assets and net fee and commission income over total assets over the period 2012-15)

- net interest income
- net fees and commission income
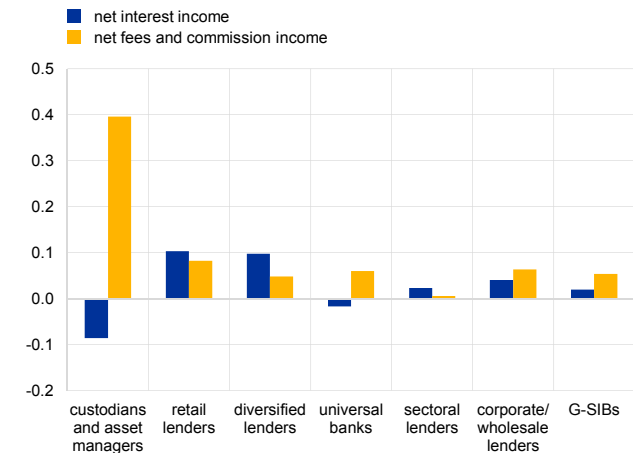
Sources: ECB and SNL.
Note: "Universal banks" also include G-SIBs that are universal banks, while "G-SIBs" exclude those banks.

However, there are also a number of banks which have managed to compensate for weak NII dynamics by increasing their F&C income. As can be seen in Chart C.5, a material number of banks have recorded positive F&C income growth, which has offset a decline in NII (banks in the upper left part of Chart C.5). Focusing on the period since 2012, custodians and asset managers as well as universal banks have managed to compensate for lower NII by increasing F&C income (see Chart C.6). Banks in other business model groups recorded both positive NII growth and F&C income growth, suggesting that for those institutions F&C income generation is likely closely linked to their general business activity. For corporate/wholesale lenders and global systemically important banks (G-SIBs), the growth of F&C income exceeded that of NII (as a percentage of total assets), while the opposite was true for retail lenders, diversified lenders and sectoral lenders. In summary, it is not fully clear whether NII and F&C income should be considered as complements or substitutes. This will likely depend on the business model that a certain bank follows and in particular on the source of F&C income considered.

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[148] This is not surprising as many products offered by banks have both an interest rate and a fee component (e.g. customer accounts and various forms of credit agreements).

Resilience of fee and commission income

The trend towards greater reliance on F&C-related activities raises the question "how stable and resilient is F&C income?" While diversifying income sources to include more F&C income offers clear advantages, from a financial stability perspective such advantages should be weighed against the possible volatility of such earnings, especially during periods of economic and financial stress. While many studies point out that F&C income tends to be more stable than other income sources such as net interest income and trading income[149], other studies suggest that this may not necessarily be the case (depending on the type of F&C income).[150]

To examine the resilience of F&C income, an empirical scenario analysis is conducted based on a bank panel regression model.[151] While substantial research efforts have been directed at modelling banks' balance sheets and forecasting loan loss and net interest income components, only a few studies have focused on fee and commission income, despite its significance as the second most important source of revenue for the majority of euro area banks.[152] Against this background, this special feature presents a model for estimating the relationship between some key macroeconomic and financial factors and (gross) fee and commission income[153] over total assets, using yearly data between 1995 and 2015 for a large sample of euro area banks.[154] Then, it shows how the estimated model can be applied to test the resilience of this source of revenue under both a baseline and an adverse macroeconomic scenario. The modelling approach and main results are described in Box 1.

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[149] See e.g. Altunbas, Y., Manganelli, S. and Marques-Ibáñez, D., "Bank Risk During the Financial Crisis – Do Business Models Matter?", *Working Paper Series*, No 1394, ECB, 2011; Demirgüç-Kunt, A. and Huizinga, H., "Bank Activity and Funding Strategies: The Impact on Risk and Returns", *Journal of Financial Economics*, Vol. 98, 2010, pp. 626-650; and Köhler, M., "Which Banks are More Risky? The Impact of Business Models on Bank Stability", *Journal of Financial Stability*, Vol. 16, 2015, pp. 195-212.

[150] See e.g. DeYoung, R. and Roland, K. P., "Product Mix and Earnings Volatility at Commercial Banks: Evidence from a Degree of Total Leverage Model", *Journal of Financial Intermediation*, Vol. 10, 2001, pp. 54-84; and Stiroh, K. J, "Diversification in Banking: Is Noninterest Income the Answer?", *Journal of Money, Credit and Banking*, Vol. 36(5), 2004, pp. 853-882.

[151] See Kok, C., Mirza, H. and Pancaro, C., "Macro stress testing euro area banks' fees and commissions", *Working Paper Series*, ECB, 2016, forthcoming.

[152] The study closest to the approach discussed in this special feature is Coffinet, Lin and Martin (2009), who propose a stress-testing model for, inter alia, (gross) fee and commission income in the French banking sector. Their model is used to predict this source of income under various scenarios; see Coffinet, J., Lin, S. and Martin, C., "Stress Testing French Banks' Income Subcomponents", Banque de France Working Paper No 242, 2009.

[153] For this analysis, F&C income includes revenues earned from a range of activities, i.e. service charges, loan servicing fees, brokerage fees, trust fees and management fees.

[154] The dataset includes an unbalanced panel of 103 banks which are supervised by the SSM and come from 19 different euro area countries. The most represented countries are Germany (20 banks), Italy (14 banks), Spain (12 banks) and France (10 banks). One country, namely Estonia, has only one banking institution in the sample. The banking data were taken from Bloomberg. The macroeconomic variables were sourced from the ECB's Statistical Data Warehouse (SDW).

Box 1

Econometric model of bank (gross) fee and commission income

In a first stage, the most relevant macro-financial indicators that may be associated with (gross) fee and commission income are selected from a larger set of potential candidate variables by applying the Least Angle Regression (LARS) procedure.[155] The number of potential candidate variables is constrained by those factors available in macroeconomic scenarios usually used in EU-wide stress-test exercises, and is also chosen in line with the existing literature. The selection approach yields the following variables as the most important predictors of (gross) fee and commission income over total assets: the lag of the dependent variable, stock market returns (both lagged and contemporaneous values), GDP growth, the lag of the first difference of both the short-term and the long-term interest rate, and residential property price growth.

In a second stage, the (gross) fee and commission income-to-total assets ratio is regressed on the selected variables. More specifically, a dynamic panel model of the following form is estimated: $y_{i,t} = \alpha_i + \varphi y_{i,t-1} + X_{i,t}\beta + \varepsilon_{i,t}$ where $y_{i,t}$ is our variable of interest and $y_{i,t-1}$ is the lagged dependent variable which captures the persistence in the (gross) fee and commission income-to-total assets ratio through the autocorrelation coefficient φ. Importantly, the model captures structural differences between banks by introducing bank fixed effects, α_i. $X_{i,t}$ is a $(1 \times j)$ vector and represents the j explanatory variables and $\varepsilon_{i,t}$ is the zero-mean bank-specific error term. We estimate this equation using two different econometric approaches, namely a system GMM estimator and the bias-corrected least squares dummy variable (LSDVC) estimator in order to ensure the necessary degree of robustness.[156] The latter is our preferred method as it is potentially more efficient than the GMM estimator and it allows for the explicit estimation of bank-specific fixed effects.

Table C.1 presents our empirical results. As shown in columns 1 and 2, the GMM and LSDVC approaches yield very similar results both in terms of coefficients and significance levels. The explanatory variables display the expected signs when significant. The coefficient on the lagged (gross) fee and commission income ratio is found to be significant and positive. This suggests a strong degree of persistence of (gross) fee and commission income over time, possibly reflecting that it is a rather stable source of income and that it may take time to build up (gross) F&C income-generating activities. Real GDP growth and stock market returns are positively associated with the (gross) fee and commission income-to-total assets ratio. Their increases respectively indicate a better-performing real economy and positive financial market developments which would both imply

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[155] The procedure was developed by Efron, Hastie, Johnstone and Tibshirani (2004). The application of this selection strategy is particularly relevant because it reduces the degree of discretion in the choice of the key explanatory factors. This is similar in spirit to the approach by Kapinos and Mitnik (2016), who employ the Least Absolute Shrinkage and Selection Operator, which is a constrained version of LARS, in a stress-testing framework. See Efron, B., Hastie, T., Johnstone, I. and Tibshirani, R., "Least angle regression", *The Annals of Statistics*, Vol. 32(2), 2004, pp. 407-499; and Kapinos, P. and Mitnik, O., "A Top-down Approach to Stress-testing Banks", *Journal of Financial Services Research*, Vol. 49(2), 2016, pp. 229-264.

[156] The inclusion of a lagged dependent variable in a panel framework might yield biased and inconsistent estimates owing to the correlation between the lagged dependent variables and the error terms (so-called Nickell bias). The GMM and the LSDVC estimator are employed to address this issue. In the former case, the equation is estimated using a system GMM estimator that combines the regression in differences with the regression in levels, an approach developed by Blundell and Bond (1998). In the latter case, we employ the approach as implemented by Bruno (2005). See Blundell, R. and Bond, S., "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, Vol. 87, 1998, pp. 115-143; and Bruno, G., "Approximating the Bias of the LSDVC Estimator for Dynamic Unbalanced Panel Data Models", *Economic Letters*, Vol. 87, 2005, pp. 361-366.

an expansion of those financial services (e.g. M&A and securities brokerage) that generate (gross) fee and commission income.

Table C.1

Regressions of (gross) fee and commission income over total assets on the selected macro and financial variables

	(1) System GMM	(2) LSDVC
F&C income/Total assets(t-1)	0.8066*** (9.29)	0.8122*** (34.22)
Short-term rate first difference(t-1)	-0.0180*** (-4.79)	-0.0199*** (-4.49)
Stock market returns(t-1)	0.0003 (1.34)	0.0003 (1.14)
Stock market returns	0.0005** (1.98)	0.0006*** (2.60)
Long-term rate first difference(t-1)	-0.0009 (-0.22)	0.0006 (0.19)
Real GDP growth	0.0053* (1.77)	0.0087*** (3.30)
Residential property price growth	-0.0008 (-0.64)	0.0005 (0.38)
Constant	0.1277** (2.01)	
Observations	1119	1119
Banks	103	103
Wald	299***	1463***
AR(2) Arellano-Bond test (p-value)	0.27	
Hansen J test (p-value)	0.11	
Number of instruments	10	

Source: Kok, Mirza and Pancaro (2016).
Notes: ***, **, and * denote significance at the 1%, 5% and 10% level, respectively. Parameter estimates based on the system GMM and LSDVC approach are shown. Z-statistics based on heteroskedasticity and autocorrelation robust standard errors are shown in parenthesis. Below the parameter estimates, the number of observations and the number of individual banking groups in the sample are provided. Furthermore, the Wald chi-square to test for the joint significance of the estimated parameters is given. Finally, for the system GMM approach the p-value based on the Arellano-Bond statistic to test for second-order autocorrelation and on the Hansen J statistic to test the validity of the over-identifying restrictions, respectively, is shown.

The estimated coefficient on the lagged first difference of the short-term rate has a negative sign. Lower short-term rates are usually associated with higher bank business volumes, which should have a positive effect on (gross) F&C income. At the same time, it may also reflect a rebalancing effect whereby a bank changes its focus from activities generating net interest income towards more F&C income-generating activities.[157]

The scale of the estimated coefficients can be interpreted in the following way: one additional percentage point of GDP growth would lead to an increase in the average (gross) fee and commission income-to-total assets ratio of circa 1%, ceteris paribus.[158]

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[157] Covas, Rump and Zakrajšek (2014) have a qualitatively similar result in this regard. See Covas, F. B., Rump, B. and Zakrajšek, E., "Stress-testing US bank holding companies: A dynamic panel quantile regression approach", *International Journal of Forecasting*, Vol. 30(3), 2014, pp. 691-713.

[158] This is based on an average (gross) fee and commission income-to-total assets ratio in our sample of 0.79%. In other words, a 1 percentage point increase in GDP growth multiplied by the estimated coefficient of 0.0087 divided by 0.79% equals 1.1%.

The estimated model (see Box 1) is used to test the resilience of euro area banks' (gross) F&C income for different macro-financial scenarios. In more concrete terms, the estimated parameters of the LSDVC model reported in column 2 of Table C.1 are used to project (gross) fee and commission income over total assets over a three-year horizon (between 2016 and 2018) conditional on the baseline and adverse macroeconomic scenarios used in the 2016 EU-wide stress test.[159] Charts C.7 and C.8 report the median, 10th percentile and 90th percentile of the country-level projections for the baseline and adverse scenarios in terms of percentage changes with respect to their end-2015 level.

Chart C.7

Under the baseline scenario, the projected fees and commissions are either steady or increasing for most countries

Baseline projections at country level of (gross) fee and commission income over total assets

(percentage change with respect to end-2015 level; median, 10th percentile and 90th percentile)

- median
- 90th percentile
- 10th percentile
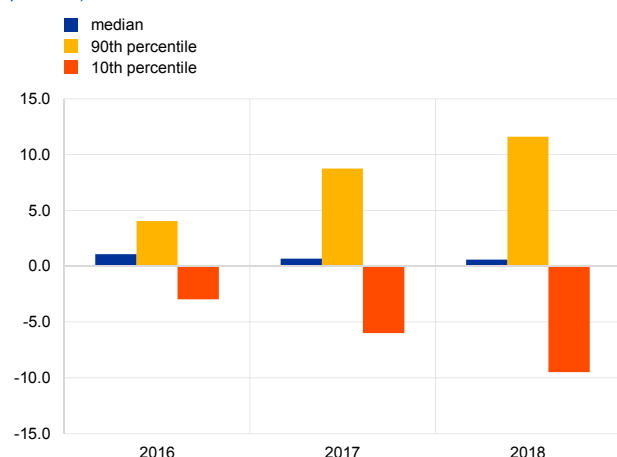
Source: ECB calculations.

Chart C.8

Under the adverse scenario, the projected fees and commissions show a decline for most countries

Adverse projections at country level of (gross) fee and commission income over total assets

(percentage change with respect to end-2015 level; median, 10th percentile and 90th percentile)

- median
- 10th percentile
- 90th percentile
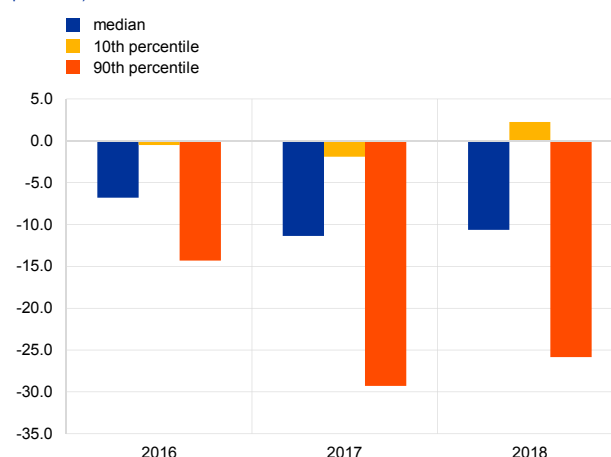
Source: ECB calculations.

The results show how fees and commissions are sensitive to different macroeconomic developments. Indeed, the resulting (gross) fee and commission projections are considerably lower under the adverse scenario than under the baseline scenario. In most cases, under the adverse scenario, the projected (gross) fee and commission income ratios show an overall decline with respect to the end-2015 starting level. On average, they reach the trough in the second year of the scenario horizon when the median decline with respect to the 2015 cut-off date is equal to 11%. However, the largest decline is much stronger at above 30%. By contrast, baseline projections exhibit either a steady or an increasing path with

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[159] Gross fee and commission income projections are first obtained at the bank level and are then aggregated at the country level. In this scenario analysis, total assets (used to compute the (gross) fee and commission income ratio) are assumed to be constant over the scenario horizon in line with the static balance sheet approach used in the 2014 and 2016 EU-wide stress tests. The scenario analysis presented here should not be confused with a fully fledged stress test, as it only focuses on projections of (gross) F&C income over total assets over the three-year horizon without a comprehensive view of how bank balance sheets would evolve under the different scenarios.

respect to the 2015 cut-off date for the majority of the countries (and banks). The median projection increases by 1% over the scenario horizon.

Chart C.9
Corporate/wholesale lenders, sectoral lenders and universal banks experience the largest deviations

Cumulative deviation over the scenario horizon between the baseline and adverse projections per business model

(CET1 ratio, basis points)
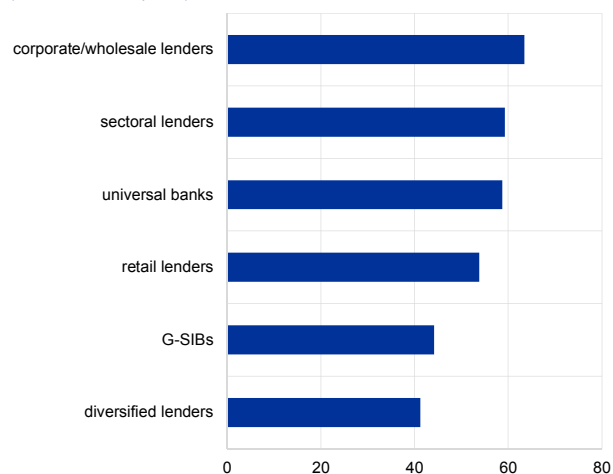
Source: ECB calculations.

Adverse developments in (gross) F&C income could have non-negligible effects on banks' solvency positions. Indeed, for the scenarios and sample of banks considered in this analysis, the cumulative average deviation between the baseline and adverse country-level projections over the scenario horizon corresponds to 55 basis points of the 2015 common equity Tier 1 (CET1) ratio.

(Gross) F&C income's resilience to macroeconomic developments differs somewhat across business models. Looking at the (gross) fee and commission projections from a bank-level perspective and clustering them according to the banks' business models, it is found that the effects of the macroeconomic scenarios are the most pronounced for the corporate/wholesale lenders, sectoral lenders, retail lenders and universal banks when measured in terms of cumulative deviation between the adverse and the baseline projections over the scenario horizon (see Chart C.9). While for these types of business models the cumulative deviation corresponds to 55-60 basis points of the 2015 CET1 ratio, for diversified lenders and G-SIBs the adverse-baseline gap is only around 40 basis points.[160] Thus, while F&C income growth has been supportive of overall income growth for those banks in recent years, it is not necessarily a stable source of income and could decline significantly in adverse circumstances.[161]

Concluding remarks

Overall, there is some evidence that many euro area banks have begun a process of shifting activities towards more fee and commission-generating operations, possibly reflecting efforts to reduce reliance on net interest income and adjusting business models more generally in an environment of low interest margins. Moreover, in recent years a weak positive relationship between net interest income growth and net F&C income growth is observed among the largest euro area banks, amid substantial cross-sectional diversity. Indeed, looking across types of business models, different patterns are observed both in terms of the nature of the underlying

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[160] The resilience of the F&C income of G-SIBs to stressful conditions may be somewhat overstated in these results due to the fact that some of the key F&C-generating activities of G-SIBs (e.g. advisory services for mergers and acquisitions, brokerage services, securitisation and syndicated lending, etc.) are not well captured in the econometric analysis.

[161] This notwithstanding, the 40-60 basis point adverse scenario impact on CET1 ratios of F&C income compared with the baseline compares favourably with for instance the 1.3 percentage point (average) CET1 ratio impact on net interest income for the 37 ECB supervised banks included in the 2016 EBA stress test (see press release of 29 July 2016).

F&C-generating activities (e.g. asset management, investment banking and retail business) and in terms of their relationship with other income sources, net interest income in particular. Furthermore, while greater reliance on F&C income could help banks to diversify their income sources, it is not clear that such a development would necessarily lead to more income stability. This is likely to depend on the type of F&C income the bank is focusing on and how well-suited to its business model set-up it is. Indeed, model-based simulations demonstrate that under adverse macro-financial scenarios banks' (gross) F&C income could be subject to material reductions, and also that the overall resilience of F&C income varies across business models.