Business Model as a Concept of Sustainability in the Banking Sector

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Abstract: The paper presents the concept of a sustainable bank by developing a framework based on performance of different business models. Traditional banking and investment activities, such as trading in securities or securitization, may reduce the risk of commercial banks and provide an attractive approach to sustainable finance. Using the method of assessing the performance of a bank, the study appraises the degree of sustainability of the bank from different stakeholders' points of view. The aim of the article is to verify the research question: how does diversification of traditional activities of commercial banks affect their sustainability? The analysis has been extended by the importance of country-specific and macroeconomic factors. The survey was conducted on 368 commercial banks from European countries, using data from the period 1998–2015. The study contributes to the ongoing discussion on the recognized profitability and sustainability nexus as an important part of sustainable finance that may be a powerful solution to financial crises.

Keywords: banking; sustainability; banking activities; performance; business model

1. Introduction

Sustainable development of the company consists in taking care of various internal and external stakeholders [1], and in particular the combined effect on the planet, people, and economies [2]. Hence, the Global Alliance for Banking on Values (GABV) formulates a sustainable bank as providing services and products that satisfy the needs of the economy and people [3]. Financial institutions have lately identified sustainability as a significant part of their projects, manifesting that sustainable banking may be a strong answer to financial slumps. The answer to this challenge in the banking sector may be a change from traditional deposit-taking and lending towards investment based on revenues from fees and commission services such as trading, insurance, and asset management. Such transition is focused on diversification advantages. Quite a number of scholars emphasize the importance of business model and activity diversification for risk reduction and show how asset and income diversification can reduce the insolvency risk of the bank [4–6]. In other cases, research emphasizes divergent views of diversification as increasing instability and abnormal risk-taking behaviors [7–9]. Motivated by the ongoing investment liberalization of financial systems in Europe, I examine whether European banks benefit from diversification of activity by extending their business for managers and shareholders to effectively create a sustainable value of the bank.

The study is stimulated by the fast expansion of the discussion on sustainable banking understood as supplying "good" services and products which are expected to respond to the needs of people and protect the environment while making profit. The scope of such banking is documented by the increase of non-interest income in banking operations. After the global financial crisis, banks' strategies of reducing the traditional model and too high expectations ensuing from universalism can be observed. The first goal of this paper is to understand the current banking business models supporting sustainability backed by different interest and non-interest services. The academic problem of this research is to examine how non-interest activities in commercial banks (i.e., derivatives,

securities-based investment activities, trading) achieve positive effects such as the mentioned risk reduction and efficiency stability. The study estimates the level of diversification of banks' activities at the level of individual banks in 36 selected European countries, dividing the full sample into two groups: (i) 25 developed, and (ii) 11 developing countries. This paper investigates the diversification of activity and focuses on commercial European banks.

The paper contributes to the literature in three main ways. First, I measure the relationship between the bank's business model and its performance sustainability in different European countries, taking into account the level of economic development. Second, my study includes three measures of risk-adjusted performance to estimate how non-interest activities affected bank stability. I therefore employ accounting measures of bank profits such as Return on Assets (ROA), risk-adjusted return as ROA divided by standard deviation of ROA, and finally Z-score showing how falling profits can push a bank into insolvency.

The article consists of five parts: (1) Introduction; (2) Literature Review and Hypotheses; (3) Description of Data and the Research Method; (4) Presentation of Results; and (5) Conclusions.

2. A Brief Literature Review and Hypotheses

Considering that banking risk may be a consequence of wrong decisions made by managers about the level of accepted risk and may result from market factors, it seems reasonable to assume that the level of this risk in individual countries is affected by the same categories of factors, yet with different intensity and with a different response of individual banks or the entire banking sector.

This study aims at providing profitability evaluation instruments for a sustainable bank: firstly, for a variety of stakeholders and secondly, for alternative criteria among stakeholders. Finally, by combining all evaluated sides of the different stakeholders, a total rank of satisfaction could be evaluated for each bank. This later appraisal can be used to estimate the sustainability of banks. Figure 1 presents the characteristics of a variety of stakeholders in a hierarchical structure used to assess various aspects of banks' sustainability.
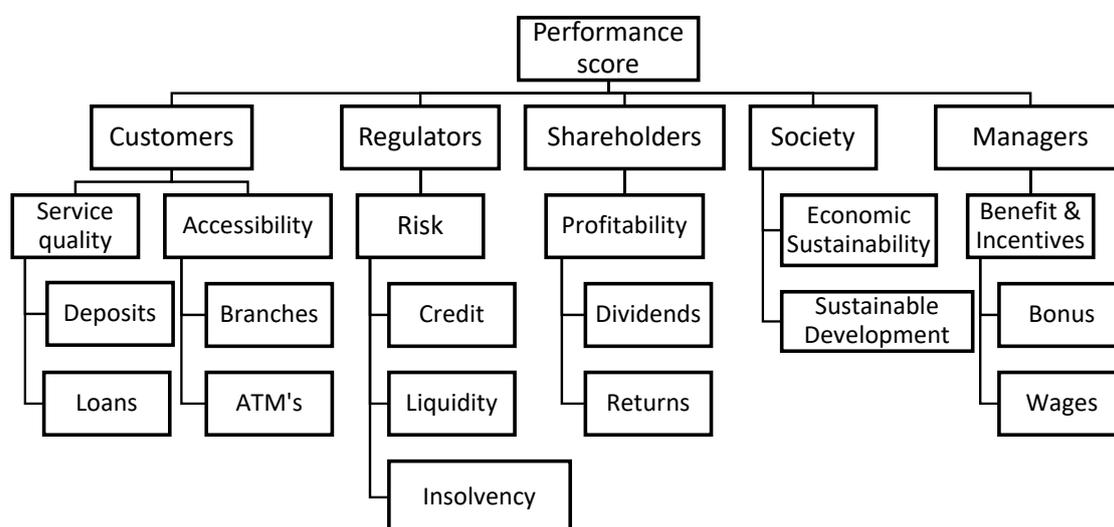

Figure 1. Hierarchical framework related to a variety of stakeholders in banks. Source: own study based on [10].

To meet the expectations of all stakeholders is difficult overall. The difficulty mostly lies in the complexity of satisfying contradictory requirements of multiple stakeholders. Borrowers hope for credits at the lowest cost, while this harmfully affects the bank's profit. Depositors look for high interest rates, which results in a strong charge on the bank. The 2007–2008 global financial crisis was an unsustainability crisis where financial institutions did not balance the interests of various stakeholders,

mainly focusing on the management's benefit [11,12]. The crisis provoked a reassessment of sustainable activity in the banking sector [13]. Banks must develop a new view after the crisis. In the literature, traditional banking activities are described as the financing of assets with liabilities and non-traditional activities based on fees and commission services undertaken by the bank [8]. Chronopoulos, Girardone, and Nankervis [14] offer a broad study on the evaluation of efficiency of European banks and indicate that diversification of banking activities positively influences their efficiency. Additionally, similar results were observed in their previous research [11]. Similarly, Peng et al. [15] examined the influence of bancassurance activity in Taiwan in 2004, and emphasized that financial institutions more engaged in similar activities tended to increase performance and gain higher benefits. Their study acknowledges that the use of a bancassurance strategy may affect the bank's efficiency. Similarly, using a sample of American commercial banks in the period of 2001–2011, Filson and Olfati [16] demonstrated that diversification towards insurance and brokerage (according to the Gramm-Leach-Bliley Act of 1999) gives the opportunity to improve banks' values. Williams [17], on the other hand, claims that in the Australian banking sector the diversification of interest income into non-traditional activities did not generate any advantages during the years 2002–2012. Moreover, he points out that non-interest income generating activities are more hazardous than traditional operations. Banks play the role of special agents in the sustainability process. They play an essential role in all forms of trade and industry through the funding and transfer of risk [18,19].

Therefore, this study is aimed at checking whether and to what extent a move towards non-traditional banking may impact the volatility of financial results and stability of banks. This is important for regulators responsible for maintaining the safety and stability of commercial banks, for managers with substantial interests in banks, and for customers from the perspective of the relationship of the bank to the borrower, which may be affected by larger profit volatility.

To estimate the bank's efficiency from managers' standpoint, I suppose that profit and encouragement are appropriate components of the gratification of managers. From the point of view of the clients, banks are most often assessed as suppliers of products and services. Finally, there are rules that protect participants in the financial system and ensure the stability of the whole financial system. To achieve these aims, regulators control risks (default risk, liquidity risk, and credit risk) as the elementary measure of banks' performance. Combining all rated results of the various stakeholders, a universal satisfaction for a bank can be judged as the sustainability of banks. There are not many papers in the literature on the impact of diversification of the bank's activities on its sustainability. Therefore, this paper presents many novel aspects, taking into account the problem that has not been identified so far. The main topic of the work on sustainability in the banking sector is the impact of asset quality on the bank's sustainability. In particular, Cooper, Jackson, and Patterson emphasize that a poor loan portfolio negatively influences the sustainability of banks [20]. On the other hand, there are items that measure the effect of the reversal, namely the importance of the bank's sustainability for its financial performance [21–24].

The main hypothesis of the research is as follows:

Hypothesis 1 (H1). *An increase in the diversification of the bank's activities generates an increase in sustainability.*

From the viewpoints of European countries, the ongoing euro area crisis has crucial implications for the European financial groups operating in Central and Eastern European countries. The global financial crisis has affected the countries of Central and Eastern Europe at the time of relatively strong financial integration with highly developed economies. Yet, given different models and development of their financial markets, their vulnerability to external shocks was also different. A sustainable value leads to positive financial results of banks during the financial crisis. As stressed by Stankeviciene and Nikonorova, the number of banks in the European Union that implement a sustainable development strategy is systematically growing to avoid an economic slowdown during the crisis [24]. I do believe

that research aimed at discovering the market mechanisms that cause banking risk will identify new crisis transmission channels and allow for early warning indicators to be developed. I thus expect a significantly stronger relationship between diversification of the bank's activities and its sustainability in developed countries.

Hypothesis 2 (H2). *High diversification of the bank's activities leads to higher bank sustainability in developed countries in Europe.*

The last decades have been a period of changes in the financial market, driven by strong competition in the conditions of globalization and deregulation. The deregulation process has reduced the barriers to market access and given the opportunity to establish new, competitive institutions. Banks, losing their privileged position, started to fight for a competitive advantage by developing new, often non-traditional ways of generating revenues. In order to increase their income, banks increased their activity in the off-balance-sheet asset market.

3. Data and Methodology

Based on a survey conducted by Mercieca, Schaeck, and Wolf [25], I develop a ratio of diversification of banking activities for each commercial bank to calculate the level of the differentiation between principal operations. The ratio of diversification of banking activities (DIV) for a bank is estimated as follows:

$$DIV = \left(\frac{NONII}{NETINC}\right)^2 + \left(\frac{NII}{NETINC}\right)^2 \tag{1}$$

where net operating income NETINC = NII + NONI, NII–net interest income, and NONI–non-interest income. Net operating income is the amount of non-interest and interest income. Net non-interest income is the difference between non-interest income and non-interest expenses. The DIV indicator covers diversification of banking operations. With an increase in the DIV ratio, the bank is increasingly concentrated and less diversified.

Based on research undertaken by Demirgüç-Kunt and Huizinga [26] and Laeven and Levine [27], a number of measures of bank instability were adopted as the basis for the bank's sensitivity to changes in non-interest income (generated from non-traditional activities). However, compared to previous surveys, the study introduces a new model based on several explained variables. In particular, the study uses three measures: ROA, risk-adjusted ROA, and Z-score. These ratios use both the bank's profitability and its leverage. The choice of indicator has been confirmed in the literature–in particular, Calmès and Théoret [28] emphasize that banks focusing on non-traditional investment activities are focused on high profitability with equally high leverage risk. The explanatory variables include both financial results for interest and non-interest activities and the bank's exposure to securities and derivatives portfolios, as well as macroeconomic variables.

To verify the hypotheses, the Ordinary Least Squares regression (OLS) model is used as presented in the Equation (2):

$$\begin{aligned}
Y_{n,i,t} = {} & \alpha + \beta_1 SIZE_{n,i,t} + \beta_2 SECUR\_TA_{n,i,t} + \beta_3 DER\_TA_{n,i,t} + \beta_4 LOAN\_TA_{n,i,t1} \\
& + \beta_5 NONI_{n,i,t} + \beta_6 NII_{n,i,t} + \beta_7 DIV_{n,i,t} + \beta_8 GDP_{i,t} + \beta_9 UNEMP_{i,t} + \beta_{10} TIME\_DUM_t \\
& + \beta_{10} TIME\_DUM_t + \beta_{11} COUNTRY\_DUM_i + \varepsilon_{i,t}
\end{aligned} \tag{2}$$

where Y is the bank's efficiency measure; I use Y = [ROA, ROA_ADJ, ZSCORE] as dependent variables, where ROA is the return-on-assets ratio; ROA_ADJ ratio is ROA-adjusted risk estimated as $\frac{\overline{ROA}}{\sigma_{ROA}}$, and a smaller ratio means higher risk weighted profits; ZSCORE is a default ratio estimated as $\frac{CAR + \overline{ROA}}{\sigma ROA}$; SIZE is the logarithm of the bank's total assets; SECUR_TA is the securities-to-total assets ratio; DER_TA is derivatives assets/total assets; LOAN_TA = loans to total assets; and NONI = non-interest income ratio (non-interest income/operating revenues). Taking into account the problems of collinearity

because of banking control variables, I made a selection of variables and considered only variables whose correlation is the lowest. A similar model was used by Lepetit, Nys, Rous, and Tarazi [29], De Jonghe et al. [30], Stiroh and Rumble [31]; Meslier et al. [32], and Mostak [33]. NII is calculated as the net interest income ratio (interest income/operating revenues); DIV is the ratio of diversification of banking activities estimated according to the formula (Equation (1)); UNEMP = rate of annual unemployment; GDP = growth of gross domestic product; TIME_DUM and COUNTRY_DUM are dummy variables for time and country; and COUNTRY_DUM variable is a country fixed effect. Finally, a random component is ε. Thus, my coefficients show conditional correlations between the various measures of bank performance and the pursued diversification strategies.

Through a dataset that covers 368 commercial banks from Bankscope database spanning the 1998–2015 period and the methodology of panel regression, the empirical findings document the risk diversification in banking activity. The full range covers banks from 25 developed European countries (Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Luxembourg, Malta, The Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom) and 11 developing countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Lithuania, Macedonia, Montenegro, Poland, Romania, and Serbia). The indicated division was made on the basis of GDP per capita ratio, according to The World Bank classification. A similar study for 1999–2006 was carried out by Lozano-Vivas and Pasiouras [34]).

Tables 1 and 2 (Panel A) indicate that total assets, loans, securities, and derivatives have increased significantly in developed and developing countries. However, in developed countries, this increase was higher. On the other hand, Tables 1 and 2 (Panel B) present descriptive statistics of banks' average indicators. Moreover, in developed countries I find a decrease in ROA, non-interest income to operating income and interest income to operating income, respectively, while in developing countries only the securities-to-total assets ratio decreased.

Table 1. Statistics for changes in nominal value of bank's assets/liabilities (Panel A), and summary statistics for ratios of bank's income diversification and macroeconomic characteristics (Panel B) in European developed countries, 1998–2015.

Developed Countries			
Panel A	1998	2015	Change %
Total assets (B EUR)	103.00	164.00	59
Total loans (B EUR)	52.30	120.00	129
Total securities (B EUR)	21.15	79.60	276
Derivatives (B EUR)	3.06	32.28	955
Total equity (B EUR)	3.58	14.82	315
Net interest income (B EUR)	4.03	4.33	7
Total non-interest income (B EUR)	0.96	2.37	147
Panel B	1998	2015	Change %
ROA (%)	0.01	0.01	–10
ROA risk adjusted (%)	0.56	1.28	129
ZSCORE	7.26	18.04	148
Securities to total assets (%)	0.20	0.46	130
Derivatives to total assets (%)	0.02	0.18	8
Loans to total assets (%)	0.50	0.79	58
Non-interest income to operating income (%)	4.54	2.43	–46
Interest income to operating income (%)	19.19	5.62	–71
Diversification index (%)	0.51	0.65	27
Unemployment rate (%)	4.48	10.11	126
GDP growth (%)	3.56	2.77	–22

The index of diversification of banking activities is on average higher in developing countries, and increased from 0.92 in 1998 to 0.93 in 2015 for commercial banks from developing countries and

from 0.51 in 1998 to 0.65 in 2015 for commercial banks from developed countries. As the diversification index rises, the bank becomes more concentrated and less diversified.

Table 2. Summary statistics for changes in nominal value of bank's assets/liabilities (Panel A), and summary statistics for ratios of bank's income diversification and macroeconomic characteristics (Panel B) in European developing countries, 1998–2015.

Developing Countries			
Panel A	1998	2015	Change %
Total assets (B EUR)	72.78	90.39	24
Total loans (B EUR)	35.83	61.75	72
Total securities (B EUR)	16.52	41.54	151
Derivatives (B EUR)	2.04	8.44	314
Total equity (B EUR)	2.64	10.55	300
Net interest income (B EUR)	2.98	3.49	17
Total non-interest income (B EUR)	0.68	1.51	123
Panel B	1998	2015	Change %
ROA (%)	0.01	0.01	11
ROA risk adjusted (%)	1.55	2.75	77
ZSCORE	11.39	23.36	105
Securities to total assets (%)	0.33	0.32	−3
Derivatives to total assets (%)	0.01	0.06	500
Loans to total assets (%)	0.41	0.63	54
Non-interest income to operating income (%)	3.37	17.47	418
Interest income to operating income (%)	15.25	15.32	0
Diversification index (%)	0.92	0.93	1
Unemployment rate (%)	5.52	6.62	20
GDP growth (%)	2.49	1.92	−23

Table 3 reports the descriptive statistics for the whole sample of 368 commercial banks from Europe. The average value for the ROA is –0.06%, with the standard deviation 4.27%, and ROA_ADJ variable is 2.25%, with the standard deviation 4.35%. The mean value of ZSCORE is 17.95 with the standard deviation 24.68%. Average non-interest income ratio is 14.14%, and ranges from –204.41 to 7437.90%. Regarding interest income ratio average value is 15.76%. The median value for diversification index (DIV) is 6.36, with the standard deviation 226.04. It means that diversification of banking activity varied in the full sample of commercial banks.

Table 3. Descriptive statistics full sample of commercial banks in European countries, 1998–2015.

	Mean	Sd	Min	Max
ROA (%)	−0.06	4.27	−272.27	0.52
ROA_ADJ (%)	2.25	4.35	−3.87	87.79
ZSCORE	17.95	24.68	−14.05	508.12
SECUR_TA (%)	0.33	0.63	0.00	7.32
DER_TA (%)	0.07	0.33	0.00	4.64
LOAN_TA (%)	0.76	5.38	0.00	340.36
NONII (%)	14.14	209.15	−204.41	7437.90
NII (%)	15.76	203.85	−519.78	9424.84
DIV (%)	6.36	226.04	0.50	13,843.33
UNEMP (%)	7.13	3.61	0.66	27.48
GDP (%)	3.11	3.76	−14.15	34.50
Observations #	1393	1393	1393	1393
Banks #	368	368	368	368

Source: Author's calculations based on Bankscope and World Bank database. DIV—diversification ratio estimated according to Equation (1); RO—return on assets; ROA_ADJ—risk adjusted profit; ZSCORE–bank's default ratio; SECUR_TA—securities to total assets ratio; DER_TA—derivatives assets/total assets; LOAN_TA—loans to total assets; NONI—non-interest income ratio (non-interest income/operating revenues); NII—net interest income ratio (interest income/operating revenues); UNEMP—rate of annual unemployment; GDP—growth of gross domestic product; #—number of observations and banks respectively.

4. Results and Discussion

The first regression results cover the entire sample of banks, the second one discriminates between the degrees of countries' development, and the third one focuses on public commercial banks. Table 4 presents the average scores for risk-adjusted performance (Model 1 ROA, Model 2 ROA_ADJ, Model 3 ZSCORE). The first regression results concern the whole sample covering all banks and show that the index of diversification of banking activities has a slight and statistically insignificant influence on the ROA and risk-adjusted ROA ratio (DIV +0.001 vs. –0.019). However, the average ZSCORE ratio decreases in Model 3 when I control for the diversification index (DIV –0.133). As the diversification index rises, the bank becomes more concentrated and less diversified. It means that more traditional activities increase the insolvency risk in commercial banks in Europe. In general, the banking risk decreases when non-interest activity increases (NONI +0.075). It means lower risk-taking by banks. In all cases (Model 1 and 2), the average performance decreases with the inclusion of non-interest income (NONI –0.001 vs. –0.24) but the average insolvency risk measured by ZSCORE decreases (NONI +0.075). In greater detail, the inclusion of derivatives in the ROA and ROA_ADJ function results in a decrease in the average scores (DER_TA –0.005 vs. –0.158). However, in Model 3 it influences positively the insolvency risk (DER_TA +0.2). The bank's performance and risk are strongly sensitive to the size of assets SIZE (Model 1 –0.003, Model 2 –0.395, Model 3 –0.078). The model also estimates the impact of different activities undertaken by banks, including security trading measured by the level of security to total assets in the bank. As for bank performance, the corresponding figures are +0.0001 (Model 1), –0.003 (Model 2), and +0.032 (Model 3). And credit policy is measured by the loans-to-assets ratio. These results suggest that performance and insolvency risk have a positive influence. Among macroeconomic factors, the changes in the annual real GDP growth rate exhibited a positive result, meaning that the GDP growth rate decreases banking stability.

Table 4. Risk-adjusted performance and diversification measure in commercial banks in European countries, over the period 1998–2015.

	ROA (Model 1)	ROA_ADJ (Model 2)	ZSCORE (Model 3)
	b/t	b/t	b/t
TA	−0.003 ***	−0.395 ***	−0.078 **
	(−3.99)	(−5.73)	(−2.87)
SECUR_TA	0.001 *	−0.003	0.032
	(1.85)	(−0.07)	(1.56)
DER_TA	−0.005 ***	−0.158 *	0.200 ***
	(−5.40)	(−1.69)	(5.40)
LOAN_TA	0.007 ***	0.210 ***	0.439 ***
	(12.95)	(3.66)	(19.26)
NONII	−0.001 **	−0.240 ***	0.075 ***
	(−2.26)	(−4.03)	(3.18)
NII	−0.005 ***	−0.436 ***	−0.110 ***
	(−8.81)	(−7.64)	(−4.88)
DIVERS	0.001	−0.019	−0.133 ***
	(1.48)	(−0.20)	(−3.54)
UNEMPLOY	−0.000 *	−0.016	0.035 ***
	(−1.79)	(−1.46)	(7.81)

Table 4. *Cont.*

	ROA (Model 1)	ROA_ADJ (Model 2)	ZSCORE (Model 3)
	b/t	b/t	b/t
GDP	0.000	0.047 *	−0.011
	(0.01)	(1.84)	(−1.03)
CONSTANT	0.065 ***	9.697 ***	3.163 ***
	(5.45)	(7.85)	(6.45)
Obs	769	756	756
# banks	148	135	135
R-sqr	0.5	0.4	0.6

DIV—diversification ratio estimated according to Equation (1); ROA—return on assets ratio; ROA_ADJ; ZSCORE—bank's default ratio; SIZE–logarithm of total assets; SECUR_TA—securities to total assets ratio; DER_TA—derivatives assets/total assets; LOAN_TA—loans to total assets; NONI—non-interest income ratio (non-interest income/operating revenues); NII—net interest income ratio (interest income/operating revenues); UNEMP—rate of annual unemployment; GDP—growth of gross domestic product; #—number of banks. In parentheses t statistics are given. The *p*-value defines significance levels at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, accordingly.

In summary, the results so far support the importance of non-traditional activities for the bank's sustainability, which is consistent with hypothesis H1.

The second regression model, presented in Table 5, discriminates between the degrees of countries' development. To explore my findings further, I divided the full sample into developed and developing countries groups. Table 5 presents the average performance scores by the country's level of development. The results show that diversification of banking activities disaggregated by the group of countries also influences positively the bank's solvency but decreases income results.

Table 5. Risk-adjusted performance and diversification measure in European developed and developing countries, over the period 1998–2015.

	Model 1A ROA (Developed)	Model 1B ROA (Developing)	Model 2A ROA_ADJ (Developed)	Model 2B ROA_ADJ (Developing)	Model 3A ZSCORE (Developed)	Model 3B ZSCORE (Developing)
	b/t	b/t	b/t	b/t	b/t	b/t
TA	−0.003 ***	−0.003 ***	−0.405 ***	−0.395 ***	−0.058 **	−0.078 **
	(−5.31)	(−3.99)	(−6.62)	(−5.73)	(−2.86)	(−2.87)
SECUR_TA	0.001 ***	0.001 *	0.010	−0.003	0.038 **	0.032
	(2.59)	(1.85)	(0.18)	(−0.07)	(2.18)	(1.56)
DER_TA	−0.006 ***	−0.005 ***	−0.207 **	−0.158 *	0.201 ***	0.200 ***
	(−6.55)	(−5.40)	(−2.07)	(−1.69)	(6.15)	(5.40)
LOAN_TA	0.007 ***	0.007 ***	0.191 ***	0.210 ***	0.434 ***	0.439 ***
	(13.42)	(12.95)	(3.23)	(3.66)	(22.39)	(19.26)
NONII	−0.001 ***	−0.001 **	−0.202 ***	−0.240 ***	0.033 **	0.075 ***
	(−3.77)	(−2.26)	(−4.96)	(−4.03)	(2.40)	(3.18)
NII	−0.002 ***	−0.005 ***	−0.295 ***	−0.436 ***	−0.055 ***	−0.110 ***
	(−7.61)	(−8.81)	(−7.99)	(−7.64)	(−4.41)	(−4.88)
DIVERS	0.000	0.001	−0.135 *	−0.019	−0.111 ***	−0.133 ***
	(0.34)	(1.48)	(−1.68)	(−0.20)	(−4.17)	(−3.54)
UNEMPLOY	−0.000 ***	−0.000 *	−0.013	−0.016	0.034 ***	0.035 ***
	(−2.98)	(−1.79)	(−1.21)	(−1.46)	(9.59)	(7.81)
GDP	0.000	0.000	0.102 ***	0.047 *	−0.004	−0.011
	(1.64)	(0.01)	(3.94)	(1.84)	(−0.43)	(−1.03)
CONSTANT	0.063 ***	0.065 ***	10.172 ***	9.697 ***	3.055 ***	3.163 ***
	(6.59)	(5.45)	(9.07)	(7.85)	(8.29)	(6.45)
Obs	1220	769	1207	756	1197	756
# banks	219	148	206	135	206	135
R-sqr	0.4	0.5	0.3	0.4	0.6	0.6

DIV—diversification ratio estimated according to Equation (1); ROA—return on assets ratio; ROA_ADJ—risk-adjusted ROA; ZSCORE–bank's default ratio; SIZE—logarithm of total assets; SECUR_TA—securities to total assets ratio; DER_TA—derivatives assets/total assets; LOAN_TA—loans to total assets; NONI—non-interest income ratio (non-interest income/operating revenues); NII—net interest income ratio (interest income/operating revenues); UNEMP—rate of annual unemployment; GDP—growth of gross domestic product; #—number of banks. In parentheses t statistics are given. The *p*-value defines significance levels at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, accordingly.

The comparison of models A and B indicates that the inclusion of non-interest income in the output results in mean performance scores that are positive and statistically significant irrespective of the level of development. However stronger influences could be observed in the case of Central and Eastern Europe than in Western Europe (in Model 2A and Model 2B NONI –0.202 vs. –0.24; and in Model 2A and Model 2B NONI 0.033 vs. 0.075). Turning to the estimates of the importance of non-traditional activities for the bank's performance, hypothesis H2 that high bank diversification leads to higher bank performance in developed countries in Europe can be partially rejected as the relationship is positive but stronger in developing countries.

As a robustness check, I narrowed the full sample only to listed commercial banks in Europe and estimated the relationship between non-traditional activities and the bank's performance and sustainability. The selection of listed banks was dictated by their specific obligations to comply with corporate governance principles. The results, displayed in Table 6, show that my main results continue to hold and they are straightforward and relatively robust across the three models.

Table 6. Risk-adjusted performance and diversification measure in public commercial banks in European, over the period 1998–2015.

	ROA	ROA_ADJ	ZSCORE
	b/t	b/t	b/t
TA	−0.004 ***	−0.193 ***	−0.038 **
	(−3.96)	(−4.70)	(−2.33)
SECUR_TA	0.008 ***	0.156 ***	0.205 ***
	(7.43)	(3.05)	(10.15)
DER_TA	−0.006 ***	−0.143	0.249 ***
	(−2.63)	(−1.41)	(6.20)
LOAN_TA	0.004 ***	0.141 ***	0.240 ***
	(4.38)	(3.59)	(15.51)
NONII	−0.004 ***	−0.145 ***	0.049 ***
	(−5.35)	(−3.95)	(3.32)
NII	−0.007 ***	−0.484 ***	−0.060 ***
	(−8.38)	(−13.82)	(−4.34)
DIVERS	−0.001	−0.053	−0.026 *
	(−1.15)	(−1.35)	(−1.70)
UNEMPLOY	−0.000 *	−0.019 *	0.022 ***
	(−1.95)	(−1.78)	(5.09)
GDP	−0.002 ***	0.047 **	−0.023 **
	(−2.94)	(2.02)	(−2.44)
CONSTANT	0.088 ***	7.084 ***	2.718 ***
	(5.37)	(9.60)	(9.34)
Obs	1848	1835	1832
# banks	331	318	318
R-sqr	0.2	0.3	0.4

DIV—diversification ratio estimated according to Equation (1); ROA—return on assets ratio; ROA_ADJ—risk adjusted ROA; ZSCORE—bank's insolvency ratio; SIZE—logarithm of total assets; SECUR_TA—securities to total assets ratio; DER_TA—derivatives assets/total assets; LOAN_TA—loans to total assets; NONI—non-interest income ratio (non-interest income/operating revenues); NII—net interest income ratio (interest income/operating revenues); UNEMP—rate of annual unemployment; GDP—growth of gross domestic product; #—number of banks. In parentheses t statistics are given. The *p*-value defines significance levels at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, accordingly.

5. Conclusions

This study provides useful insights on the views of risk diversification as the measure of sustainability. Certainty, the estimate utility functions of risk diversification are used to calculate the utility indicator for bank performance. The bank's performance estimate provides a picture of the degree of its sustainability. Vickers' 2011 report [35] highlighted the importance of separating retail operations of systemically important banks and the need to strengthen the capital base, including the strengthening of retail banking requirements. It is worth noting that a separation of retail and investment banks would strengthen their capacity to absorb losses and enhance the risk of insolvency.

This study emphasizes the inclusion of proxies for non-traditional activities as an output in studies of bank performance. A closer investigation shows a positive relationship between risk-adjusted performance and income diversification. In all cases, risk is mainly positively correlated with the share of fee-based activities.

I use a sample of 368 commercial banks from 25 developed and 11 developing European countries spanning the 1998–2015 period and estimate the inclusion of traditional and non-traditional activities on the bank's sustainability across countries.

The study highlights several important issues: a) for commercial bank stakeholders: diversification of commercial bank income through non-traditional activities may have beneficial results for bank stability/performance, but this is volatile income that may trigger an additional risk of default or increased loan costs, particularly for small-sized affiliates in small banks; and b) for supervisors: the widespread bank portfolio diversification makes them more comparable and strengthens the interdependency between market participants, thereby increasing systemic risk. The lack of sustainability, especially in crisis situations, when banks do not deal with the issue of balancing the interests of various stakeholders, with a skewed emphasis on individual benefits for senior management, is not conducive to the stability of the financial sector, and thus people and the economy as a whole [36]. In addition, it can be concluded that the integration of traditional and investment banking activities may decrease the risk of commercial banks. However, researchers are more prudent and point out that while an increase in the versatility of banking operations may potentially reduce risk, the benefits of risk diversification are limited [37].

My findings have two broad implications for research on commercial banks in Europe. First, the diversification process based on different sources of non-interest income has positive effects on bank sustainability. Second, my results point out that non-traditional activities tend to reflect the bank's sustainability a little more strongly in developing countries of Europe. The study provides a basis for continuation towards the verification of the importance of banking services provided for the sustainable development of the economy.

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