

Bank Business Model Migrations in Europe Determinants and Effects

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Background

- The analysis of banks' business models (BM) is important to understand banks' activities, customer groups, distribution channels and sources of profits. It is also crucial to understand the nature of banks' risks and their contribution to systemic risk throughout the economic cycle.
- Since the global financial crisis, the European banking sector has undergone fundamental changes, which have led to a re-thinking of bank business models. These changes have significant implications for policymakers.
- A diverse financial system is considered more resilient and supervisors are concerned with the sustainability of each bank's strategy. A central component of the EU Supervisory Review and Evaluation Process (SREP) requires supervisors to assess, among other things, the sustainability of each bank business model.

Bank Business Models

- The literature provides different definitions of bank BM. Studies attempting to define BM focus on one or more of the following characteristics:
 - ① activities
 - ② funding profiles
 - ③ ownership structure
 - ④ objectives
 - ⑤ risk profile
- These features, however, change over time.

Why do banks change their business model?

- Ayadi et al (2016) identify three main factors (o drivers) of migration:
 - ① to respond to market forces and competitive pressures
 - ② to respond to regulatory and government led decisions
 - ③ other strategic/managerial reasons
- However:
 - ① The direction of the change differs in different time periods (Roengpitya et al., 2014).
 - ② There is no evidence that poor pre-switch performance leads banks to reassess their BM (Roengpitya et al., 2017).
 - ③ There is no evidence on the impact of the change of BM on bank performance.

What we do

- We contribute to the ongoing debate on bank business models by:
(1) identifying the BM of EU banks; **(2)** evaluating the changes in BM over time; **(3)** assessing the determinants of these changes; and **(4)** evaluating whether migrating banks improve their performance.
- Our main research questions:
 - ① What are the determinants of banks' business model migration?
 - ② What are the effects of such migration on bank performance (i.e. profitability, risk and cost efficiency) in subsequent years?

Main Findings

- We find that banks with ex-ante lower profitability are more likely to change business model. Similarly, riskier banks are also more likely to switch. Interestingly, better capitalised banks are also more likely to switch, possibly as a way to diversify and invest extra resources.
- We also find that smaller banks, banks involved in M&A operations and banks that received state aid or were nationalised during the financial crisis are more likely to migrate.
- When we look at the effect of migration on bank performance, we find that migrating banks perform better than their peers in the years post migration, both in term of profitability, risk and cost efficiency.

Our sample

- We consider banks from 32 European Economic Area (EEA) countries and Switzerland.
- The sample includes 22,787 bank-year observations during the period 2005-2016, covering both the period before and during and after the financial crisis and the Eurozone crisis.
- Data are collected from several data sources: bank-specific variables from SNL (S&P Global Market Intelligence); macroeconomic variables from the World Bank; state aid information from the ECB and the European Commission databases; and corporate operations data (M&A) are collected from the Zephyr database.

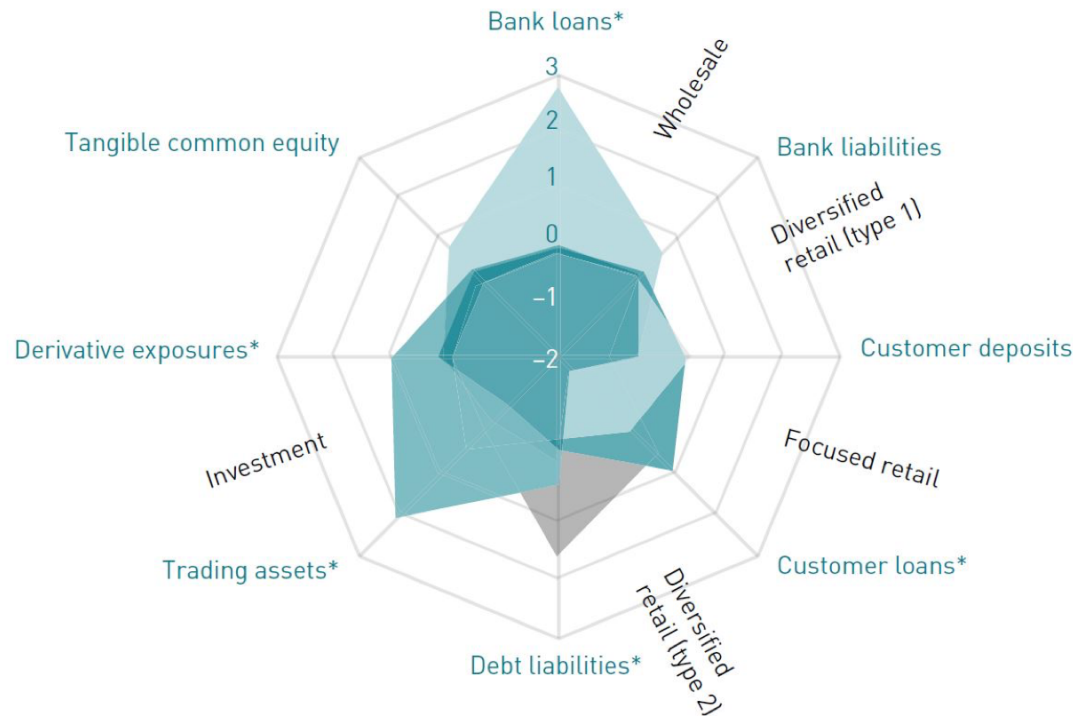
Empirical Analysis

Our empirical strategy comprises several steps.

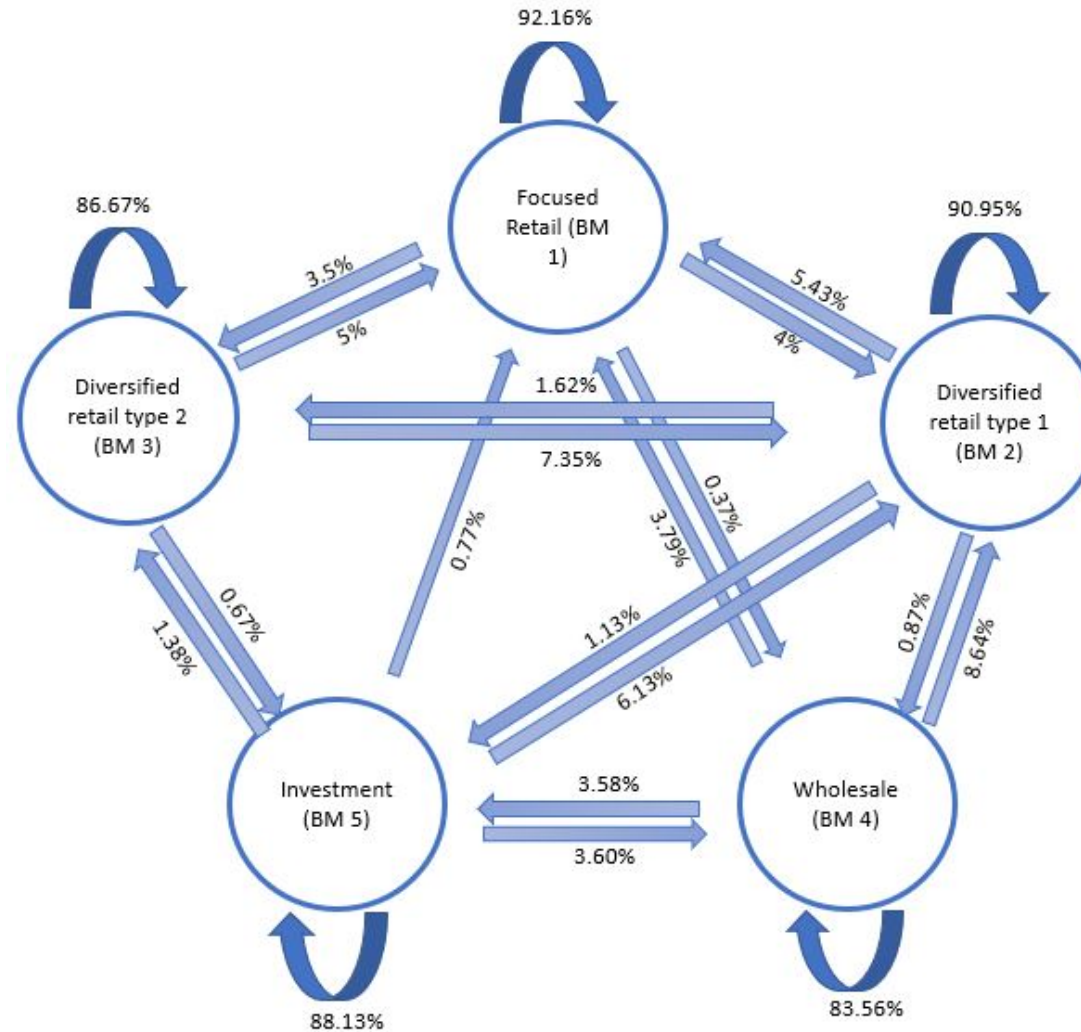
- ① Allocation of each bank to a business model (cluster analysis)
- ② Evaluation of the switches or migrations each year (transition matrix)
- ③ Identification of the determinants of a bank's decision to migrate (Logit regression)
- ④ Evaluation of the effects of the migration (Propensity Score Matching)

Defining Bank Business Models

- We follow the definition proposed by Ayadi et al (2015), based on cluster analysis (Ward's method).
- We identify five business models: (1) focused retail; (2) diversified retail (type 1); (3) diversified retail (type 2); (4) wholesale; (5) investment.



Business model migrations: the transition matrix



Business model migrations: the transition matrix

- In general, banks have a stable business model during the years under investigation.
- In our sample there are 1,936 migrations on a total of 19,500 observations available during the period analysed (about to 10% of the sample). On a total of 3,287 banks, we have 1,402 banks that change at least once in the period considered.
- Ranking in terms of “business model persistence”:
 - 1 “Focused retail” banks (92%)
 - 2 “Diversified retail (type 1)” banks (91%)
 - 3 “Diversified retail (type 2)” banks (87%)
 - 4 “Investment” banks (88%)
 - 5 “Wholesale banks” (84%)
- Considering both inflows and outflows from a business model to another, “focused retail” banks are net acquires (+7%) along with “diversified retail (type 1)” (+18%). On the contrary, all other models lose more banks than they acquire.

Distribution of Migrating and Non-migrating banks Over Time

	Number of banks		Total Assets	
	Non-migrating banks	Migrating banks	Non-migrating banks	Migrating banks
Pre-crisis	90.26%	9.74%	93.37%	6.63%
Crisis	91.13%	8.87%	91.07%	8.93%
Recovery	89.44%	10.56%	93.47%	6.53%
Total	90.07%	9.93%	93.08%	6.92%

Distribution of Migrating and Non-migrating banks by Size, Ownership and Region

	Non-migrating banks		Migrating banks	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
Small	5096	90.55%	532	9.45%
Medium	5,277	90.22%	572	9.78%
Large	7,191	89.63%	832	10.37%
Commercial	4,223	87.27%	616	12.73%
Savings	3,876	91.70%	351	8.30%
Cooperative	8,762	90.78%	890	9.22%
Nationalised	222	86.05%	36	13.95%
Public	481	91.79%	43	8.21%
Eurozone	13,853	89.83%	1,568	10.17%
Non-Eurozone	3,711	90.98%	368	9.02%
Total	17,564	90.07%	1,936	9.93%

The determinants of migration

VARIABLES	Mod1	Mod2	Mod3	Mod4
Constant	-0.439 (0.527)	-0.349 (0.528)	-0.468 (0.537)	-0.085 (0.550)
EQ_TA _{t-1}	0.605* (0.354)	0.603* (0.353)	0.609* (0.353)	0.642* (0.357)
INTANGIBLE_TA _{t-1}	0.558 (3.408)	-0.230 (3.513)	-0.182 (3.515)	-0.949 (3.563)
SIZE _{t-1}	-0.040** (0.018)	-0.053*** (0.019)	-0.055*** (0.019)	-0.074*** (0.019)
ROA _{t-1}	-2.927*** (1.064)	-2.792*** (1.063)	-2.762*** (1.063)	-2.706** (1.056)
COST_INCOME _{t-1}	0.008 (0.006)	0.008 (0.006)	0.008 (0.006)	0.007 (0.006)
RWA _{t-1}	0.035*** (0.013)	0.034*** (0.012)	0.034*** (0.012)	0.032** (0.013)
COMMERCIAL	-0.017 (0.154)	-0.013 (0.154)	0.153 (0.198)	0.168 (0.198)
COOPERATIVE	-0.417** (0.166)	-0.410** (0.167)	-0.249 (0.207)	-0.243 (0.207)
SAVINGS	-0.255 (0.167)	-0.237 (0.168)	-0.072 (0.208)	-0.021 (0.209)
DUMMY_M&A _{t-1}	-	0.284** (0.116)	0.253** (0.118)	0.249** (0.118)
NATIONALIZED	-	-	0.377* (0.295)	0.381* (0.294)
AD_HOC _{t-1}	-	-	0.738* (0.383)	0.742* (0.383)
SCHEME _{t-1}	-	-	-0.357 (0.297)	-0.381 (0.299)
FOCUS_BM _{t-1}	-	-	-	-0.356*** (0.120)
BM_TYPE1 _{t-1}	-	-	-	-0.179 (0.118)
BM_TYPE2 _{t-1}	-	-	-	0.068 (0.129)
BM_WHOLESALE _{t-1}	-	-	-	-0.332** (0.157)
Year dummies	YES	YES	YES	YES
Country dummies	YES	YES	YES	YES
Observations	16,113	16,113	16,113	16,113
Log Likelihood	-4984.9093	-4966.1817	-4978.7292	-4981.9937
Log-R squared	0.0285	0.0321	0.0297	0.0291

The effects of migration on bank performance

ATET	Coef.	Std. Err.	[95% Conf.	Interval]
$ROA_t - ROA_{t-1}$	-0.003	0.0025	-0.0080	0.0017
$ROA_{t+1} - ROA_t$	0.005**	0.0029	0.0007	0.0106
$ROA_{t+2} - ROA_t$	0.005*	0.0032	-0.0009	0.0117
$Z_t - Z_{t-1}$	-0.420	0.4736	-1.3484	0.5081
$Z_{t+1} - Z_t$	1.616***	0.5791	0.4813	2.7514
$Z_{t+2} - Z_t$	0.056	0.4842	-0.8923	1.0057
$C.I_t - C.I_{t-1}$	-0.061	0.1920	-0.4379	0.3149
$C.I_{t+1} - C.I_t$	-0.163*	0.1019	-0.3629	0.0367
$C.I_{t+2} - C.I_t$	0.0174	0.0807	-0.1407	0.1756
$RWA_t - RWA_{t-1}$	-0.057	0.0613	-0.1777	0.0629
$RWA_{t+1} - RWA_t$	0.061	0.0514	-0.0395	0.1620
$RWA_{t+2} - RWA_t$	0.061	0.0387	-0.1371	0.0148

Robustness tests

To validate our findings, we implemented two robustness checks:

- 1 alternative time windows
- 2 alternative neighbor match techniques

The results are robust.

Migrations post M&A

Panel A: Effects of migrations of banks involved in M&A operations				
	Coef.	Std. Err.	[95% Conf. Interval]	
ATET				
$ROA_t - ROA_{t-1}$	-0.018	0.017	-.053	.016
$ROA_{t+1} - ROA_t$	0.016	0.016	-0.014	0.047
$ROA_{t+2} - ROA_t$	0.001	0.004	-0.006	0.009
$Z_t - Z_{t-1}$	0.066	0.330	-0.582	0.715
$Z_{t+1} - Z_t$	0.102	0.438	-0.756	0.962
$Z_{t+2} - Z_t$	-0.274	0.862	-1.964	1.415
$C.I_t - C.I_{t-1}$	0.185	0.167	-0.142	0.513
$C.I_{t+1} - C.I_t$	-0.031	0.221	-0.465	0.401
$C.I_{t+2} - C.I_t$	-0.279	0.211	-0.692	0.134
$RWA_t - RWA_{t-1}$	-0.020	0.016	-0.053	0.012
$RWA_{t+1} - RWA_t$	-0.003	0.020	-0.036	0.043
$RWA_{t+2} - RWA_t$	-0.002	0.023	-0.048	0.044
Panel B Effects of migrations of banks involved in M&A operations as targets				
$ROA_t - ROA_{t-1}$	-0.004	0.007	-0.018	0.009
$ROA_{t+1} - ROA_t$	0.010**	0.005	-0.002	0.020
$ROA_{t+2} - ROA_t$	0.011*	0.006	-0.001	0.023
$Z_t - Z_{t-1}$	-0.018	0.757	-1.669	1.301
$Z_{t+1} - Z_t$	-0.408	0.418	-1.229	0.412
$Z_{t+2} - Z_t$	0.185	0.883	-1.546	1.917
$C.I_t - C.I_{t-1}$	0.536	0.375	-0.199	1.272
$C.I_{t+1} - C.I_t$	-0.408	0.418	-0.123	0.412
$C.I_{t+2} - C.I_t$	-0.601	0.456	-1.497	0.293
$RWA_t - RWA_{t-1}$	-0.014	0.020	-0.054	0.025
$RWA_{t+1} - RWA_t$	-0.026*	0.015	-0.057	0.003
$RWA_{t+2} - RWA_{t-1}$	-0.003	0.045	-0.091	0.085

Migrations post State Aid

Effects of migrations of banks that received ad hoc state aids				
ATET	Coef.	Std. Err.	[95% Conf.	Interval]
$ROA_t - ROA_{t-1}$	-0.006	0.005	-0.016	0.003
$ROA_{t+1} - ROA_t$	0.002	0.001	-0.001	0.005
$ROA_{t+2} - ROA_t$	0.002	0.001	-0.001	0.005
$Z_t - Z_{t-1}$	0.337	0.698	-1.030	1.706
$Z_{t+1} - Z_t$	-0.002	0.879	-1.725	1.721
$Z_{t+2} - Z_t$	0.355	0.834	-1.28	1.992
$C.I_t - C.I_{t-1}$	0.043	0.067	-0.088	0.176
$C.I_{t+1} - C.I_t$	-0.142*	0.078	-0.297	0.012
$C.I_{t+2} - C.I_{t-1}$	-0.119*	0.067	-0.253	0.014
$RWA_t - RWA_{t-1}$	-0.033	0.035	-0.102	0.036
$RWA_{t+1} - RWA_t$	0.189	0.173	-0.151	0.529
$RWA_{t+2} - RWA_t$	-0.096	0.091	-0.274	0.082

Conclusions

- Our study contributes to the understanding of the drivers of bank business model changes.
- They provide new evidence about the drivers that lead banks to change their business models, highlighting that the change depends mainly on low profitability, high levels of risk, and capitalization.
- Considering that the business model analysis can prove useful insights in the current debate on proportionality in the regulation and structural reform of the EU banking sector (Ayadi et al., 2016) and that a diverse banking system is seemingly more resilient than a system that tends to converge toward one business model, our findings may be helpful for regulators and authorities to both better comprehend the drivers of the migration among the different banks' business models and to exploit these variables to address, in case, the banks to specific business models.

Conclusions

- The present study has only examined the drivers of bank migration; however, further work will concentrate on the factors driving bank migration by considering both from where and to which business models banks migrate.
- It is well known that the business model analysis has a predictive power that is essential for regulators and supervisors to investigate the level of risk accumulation at a systems level over a period of time (Ayadi et al., 2016).
- In light of this, understanding where banks effectively migrate and which are the drivers and the effects of this event may be crucial to controlling the level of risk in the banking sector.