Bank Business Models' Migrations in Europe Determinants and Effects

R. Ayadi, P. Bongini, B. Casu, D.Cucinelli

2018 EBA Policy Research Workshop

London, 28-29 November, 2018

Background

- Since the global financial crisis, the European banking sector has undergone fundamental changes, which have lead 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. For example, if a bank has a wide array of activities or whether it focuses on only a few lines of business.
- 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.

Bank Business Models

- The importance of BM was also recognised in the EU regulatory framework as a central component of the Supervisory Review and Evaluation Process (SREP), which requires supervisors to assess, among other things, the sustainability of each bank business model.
- 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?

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.

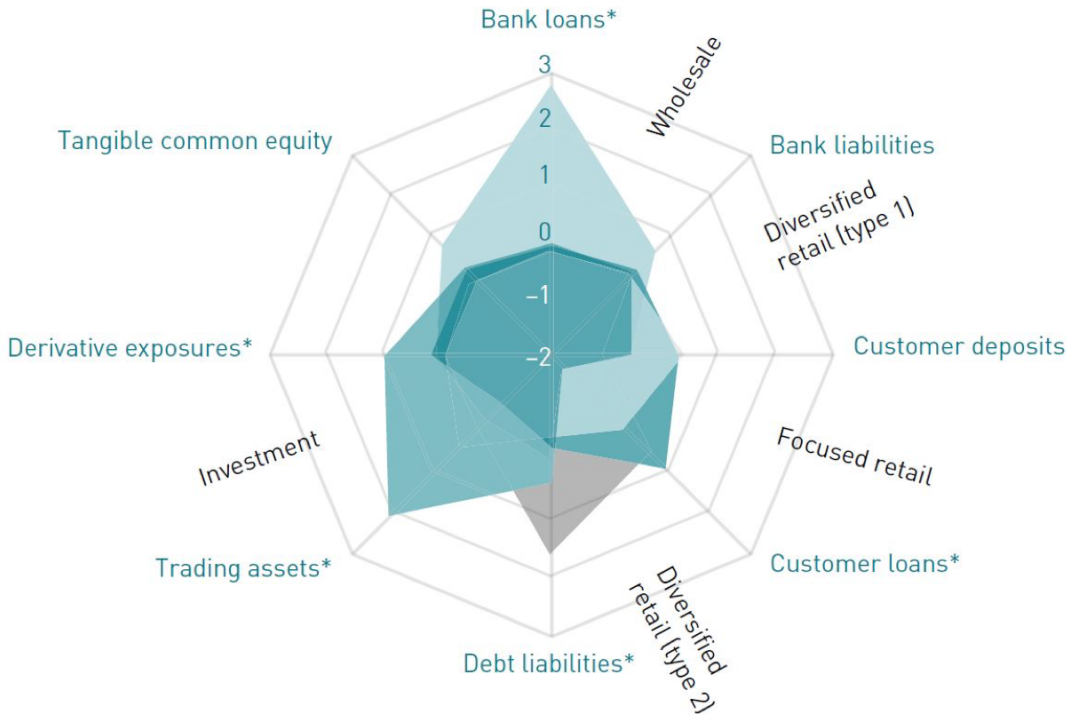
Empirical Analysis

Our empirical strategy comprises several steps.

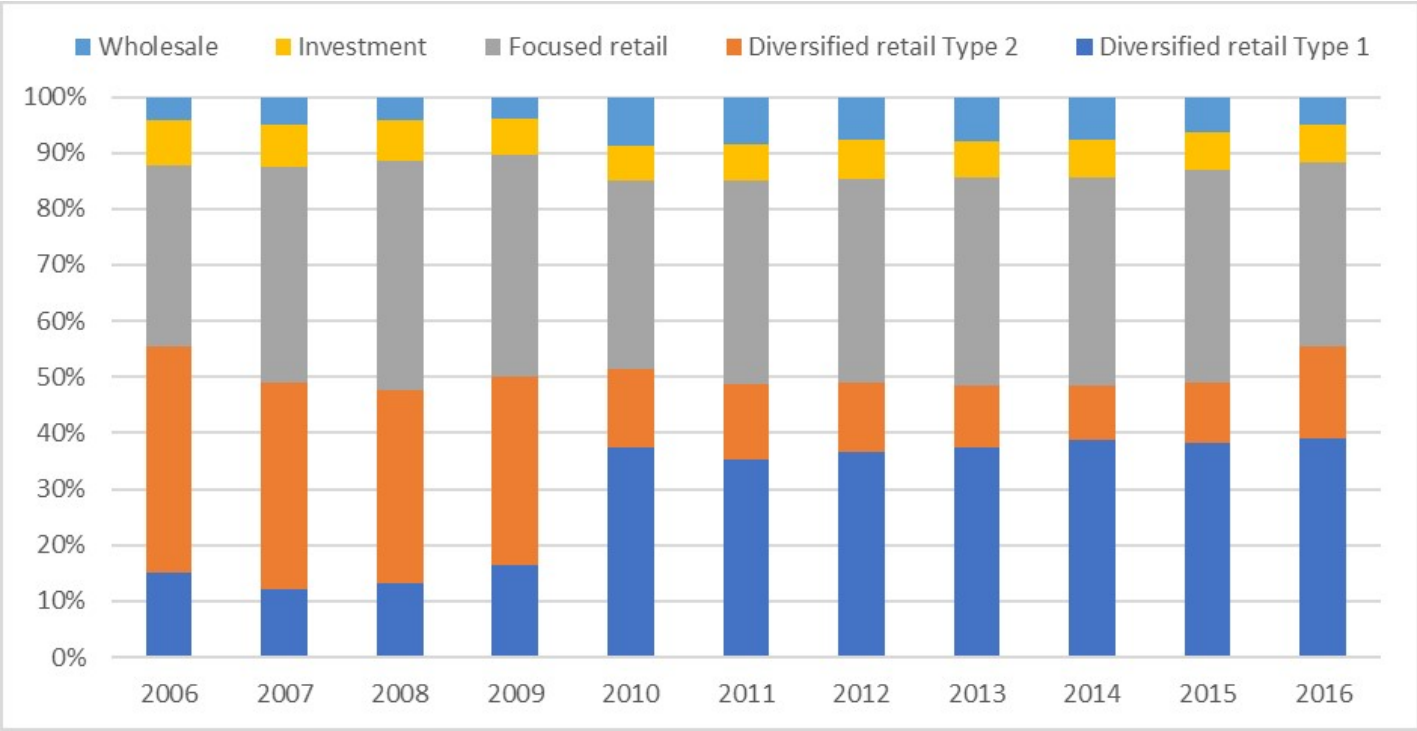
1. Allocation of each bank to a business model (cluster analysis)
2. Evaluation of the switches or migrations each year (transition matrix)
3. Identification of the determinants of a bank's decision to migrate (Logit regression)
4. Evaluation of the effects of the migration (Propensity Score Matching)

Defining Bank Business Models

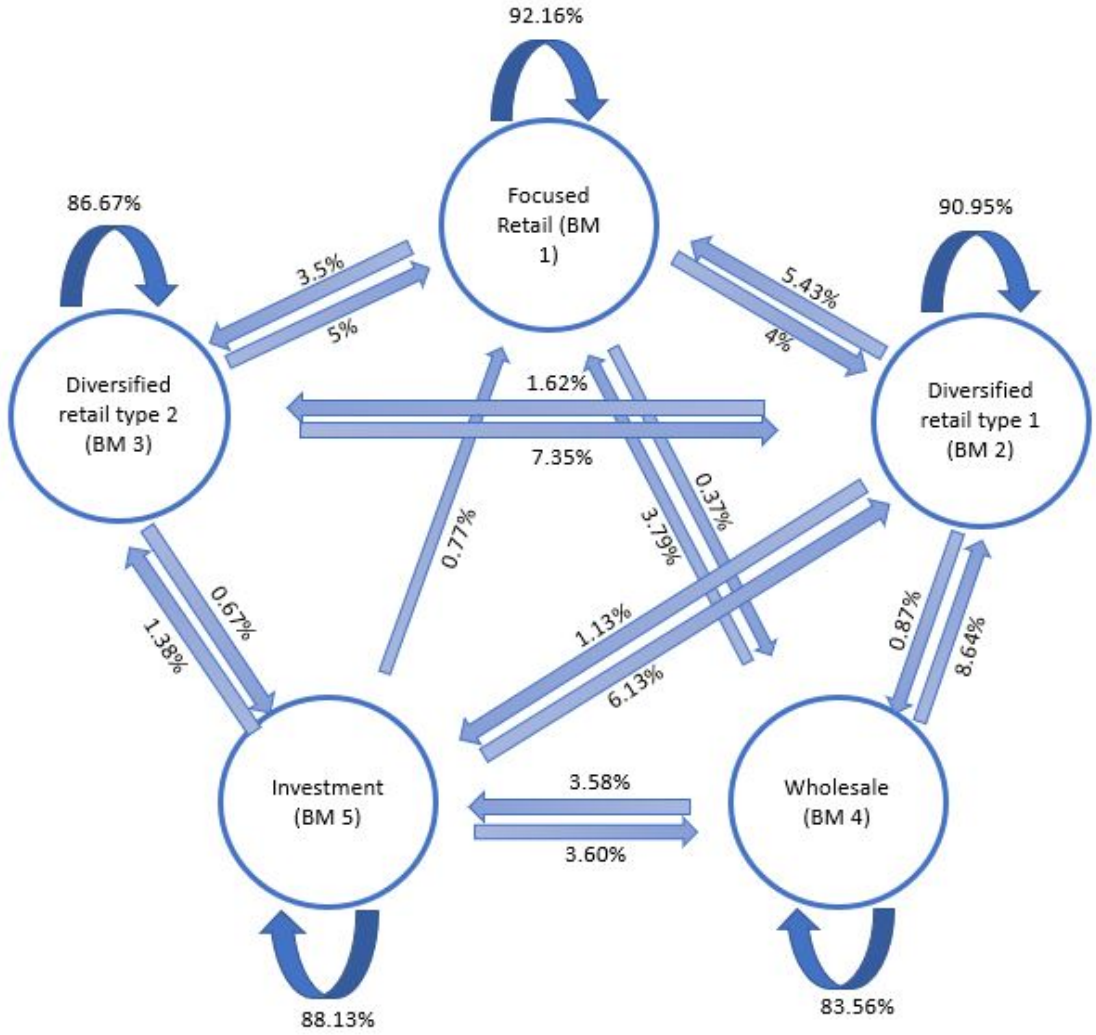
- We follow the definition proposed by Ayadi et al (2015), based on cluster analysis (Ward's method).
- We identify five business models: (1) focused retail; (2) diversified retail (type 1); (3) diversified retail (type 2); (4) wholesale; (5) investment.



Business models in European banking



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.

Descriptive Statistics

Panel A By period investigated			
Cluster	**Migrating banks**	**Non-migrating banks**	**Total**
Pre_crisis	49	454	503
%	(9.74)	(90.26)	(100.00)
Crisis	627	6,440	7067
%	(8.87)	(91.13)	(100.00)
Recovery	1,260	10,670	11930
%	(10.56)	(89.44)	(100.00)
Panel B by bank size			
SMALL	532	5096	5,628
%	(9.45)	(90.55)	(100.00)
MEDIUM	572	5,277	5,849
%	(9.78)	(90.22)	(100.00)
LARGE	832	7,191	8,023
%	(10.37)	(89.63)	(100.00)
Panel C by bank ownership structure			
Commercial	616	4,223	4839
%	(12.73)	(87.27)	(100.00)
Savings	351	3,876	4,227
%	(8.30)	(91.70)	(100.00)
Cooperative	890	8,762	9,652
%	(9.22)	(90.78)	(100.00)
Nationalised	36	222	258
%	(13.95)	(86.05)	(100.00)
Public	43	481	524
%	(8.21)	(91.79)	(100.00)
Panel D by geographical area			
Euro_zone	1,568	13,853	15,421
%	(10.17)	(89.83)	(100.00)
Non_Euro_zone	368	3,711	4,079
%	(9.02)	(90.98)	(100.00)
Total	1,936	17,564	19,500
%	(9.93)	(90.07)	(100.00)

The determinants of migration

VARIABLES	Mod1	Mod2	Mod3	Mod4
Constant	-0.439	-0.349	-0.468	-0.085
	(0.527)	(0.528)	(0.537)	(0.550)
EQ_TA_{t-1}	0.605*	0.603*	0.609*	0.642*
	(0.354)	(0.353)	(0.353)	(0.357)
$INTANGIBLE\_TA_{t-1}$	0.558	-0.230	-0.182	-0.949
	(3.408)	(3.513)	(3.515)	(3.563)
$SIZE_{t-1}$	-0.040**	-0.053***	-0.055***	-0.074***
	(0.018)	(0.019)	(0.019)	(0.019)
ROA_{t-1}	-2.927***	-2.792***	-2.762***	-2.706**
	(1.064)	(1.063)	(1.063)	(1.056)
$COST\_INCOME_{t-1}$	0.008	0.008	0.008	0.007
	(0.006)	(0.006)	(0.006)	(0.006)
RWA_{t-1}	0.035***	0.034***	0.034***	0.032**
	(0.013)	(0.012)	(0.012)	(0.013)
COMMERCIAL	-0.017	-0.013	0.153	0.168
	(0.154)	(0.154)	(0.198)	(0.198)
COOPERATIVE	-0.417**	-0.410**	-0.249	-0.243
	(0.166)	(0.167)	(0.207)	(0.207)
SAVINGS	-0.255	-0.237	-0.072	-0.021
	(0.167)	(0.168)	(0.208)	(0.209)
$DUMMY\_M\&A_{t-1}$	-	0.284**	0.253**	0.249**
		(0.116)	(0.118)	(0.118)
NATIONALIZED	-	-	0.377*	0.381*
			(0.295)	(0.294)
AD_HOC_{t-1}	-	-	0.738*	0.742*
			(0.383)	(0.383)
$SCHEME_{t-1}$	-	-	-0.357	-0.381
			0.297)	(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				
ATET	Coef.	Std. Err.	[95% Conf.	Interval]
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	-.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. We find that banks with ex-ante lower profitability are more likely to change business model. Similar 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.

Conclusions

- Comparing banks involved in M&A operations, we find that there are no significant difference in performance between banks who migrate and those who do not, following an M&A. However, considering only banks involved in a M&A operation as target bank, we find that target banks that migrate after the M&A operation show a better performance in term of profitability and risk.
- Banks migrating following ad-hoc state aid or nationalisation improve their performance (particularly in terms of increased cost efficiency) more than those banks who do not switch following state aid.