

Does capital structure impact bank performance and stability after the crisis? A case of the French market

Marc Kouze¹

Banking literature generally analyzes the effects of capital structure by focusing on bank performance comparisons. In a post-crisis economic context marked by the new regulatory requirements, this article aims to analyze the impact of the ownership of French banks (foreign / domestic) on performance and stability. We show that domestic banks are more profitable and more efficient than foreign banks. In addition, with lower risk of insolvency, domestic banks seem to be better adapted to the new solvency rules than foreign banks.

Keywords: Shareholder structure, banking regulations, crisis, banking performance

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¹ Associate Professor, IFC Renmin University of China.
Research associate, GRANEM University of Angers.
E-mail : mkouzez@hotmail.com

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Introduction

The global banking system has experienced substantial regulatory and structural changes since the 1980s. Financial liberalization has led to a strong flow of capital and development of financial systems. The globalization of financial activity and technological advances constitute the two main pillars of this financial mutation. Even if the process of liberalization differs between countries, the main measures revolve around the privatization of public banks, the suppression of regulation and control on the prices of banking services in order to allow for a more mobility of capital between the different domestic capital markets as well as between countries (De Boissieu, 1987). Whether in the United States or in Europe, these measures have improved the quality of the bank services offered, established a judicial and regulatory framework in accordance with international standards, and drawn more funds for internal investment projects (Levine, 1996)]. Characterized by optimistic anticipation for growth of liquidity and by strong bank competition, the arrival of foreign actors in the banking systems has been subject to abundant literature [Yeyati et al. (2007), Bertay et al. (2013), Demirgüç-Kunt (2013), Barry (2016)...]. Many studies have thus focused on the analysis of characteristics differentiating banks according to their ownership structure [Claessens et al. (2001), Bonin et al. (2005), Chantapong (2005), Micco et al. (2007), Havrylchyk et al. (2011), Berger et al. (2013), Shaban et al. (2018)...].

Moreover, the *subprime* financial crisis that occurred in the United States in 2007 progressively has expanded to nearly all developed countries. This crisis raises fundamental issues about the stability of the banking industry. Various reforms have been applied to face this crisis. In this direction, the Basel Committee undertook a series of measures, known today under the name of the “Basel III”, which mainly consist in increasing the bank’s regulatory capital *via* re-capitalization on the one hand and *via* reducing their risk-weighted assets on the other hand in order to reinstall the stability of the banking system. This new prudential

regulation has incited a large debate not only around the performance of banking systems that are too restrained but also around the specificity attributed to foreign banks and thus to the existence of differentiated reactions of banking markets depending on the nature of banking actors working in these markets [Spinassou (2016), Bitar et al. (2018)...].

Like other Western countries, the banking sector in France witnessed tremendous numbers of domestic bank mergers and acquisitions and foreign acquisitions since the 1980s. Indeed, the French banking system underwent a fundamental structural reform in 1984. This reform is considered to be the main legislation governing banking activities in France and a pillar in the modernization process of the French banking system. It removed most of the distinctions between commercial banks and merchant banks and grouped most financial institutions under a single supervisory system. The financial changes hitting the banking market progressively encouraged a decrease of the number of banking establishments and an increase in the degree of concentration [Vennet (1996), Goddard et al., (2007), Berger et al., (2010)]. Consolidation of the French banking system resulted in the absorption of local banks either by large national banks or by large international mutual groups (Meslier et al., 2016). The total number of credit institutions was thus greatly reduced since the implementation of the 1984 banking reform. With 2,001 institutions in 1984, then 925 in 2003, there are currently only 389 institutions including 136 foreign-owned institutions². Indeed, the recent 2007-2009 crisis has played an undeniable role in the decreasing number of credit institutions.

The empirical banking literature generally analyzes the effects of the opening of the banking market in developed countries by concentrating on comparisons of profitability or efficiency between foreign-owned and domestically-owned institutions [Vennet (1996), Peek et al. (1999), Claessens et al. (2001), Sathye (2001), Micco et al. (2007), Shaban et al. (2018)...]. Although many studies deal with the question of the impact of foreign ownership on bank performance, the results on banking performance that these studies provide are generally contradicting. Motivated by these conflicting findings and by the new prudential regulation, we revisit the link between banks ownership structure (foreign/domestic) and the banking performance and stability for French commercial banks. Compared with the existing literature, our analysis differs mainly on three grounds.

First, this article adopts two perspectives of bank performance: profitability and efficiency and considers then many financial variables to capture different dimensions of bank activities. Second, to our knowledge, no studies have focused on the relationship between the level of

² Data extracted from “*Bulletin de la commission bancaire n°31 de 2004*” and from the ORBIS database.

bank stability and ownership structure in developed countries. This article proposes then to extend the literature by integrating the risk of insolvency in our analysis. Third, since the French market has not been the subject of any empirical analysis in the post-crisis economic context, our data set on France during the period 2011-2017 provides an excellent setting for analyzing the impact of the foreign/domestic ownership structure of banks on their performance and stability particularly after the third Basel accord. Indeed, taking risk of insolvency into consideration enriches the debate on the adaptation of banks to new regulatory framework in terms of capital adequacy depending on the capital structure.

Our results reveal that domestically-owned banks can be distinguished by higher levels of profitability and efficiency than foreign-owned banks. Furthermore, the results show that domestically-owned banks have adapted better to the new regulatory requirements in terms of solvency compared to their foreign counterparts.

The article is organized as follows. The first section presents a review of the banking literature in relation with capital structure in developed and developing markets. The second section presents the data, the methodology as well as the econometric models. The final section presents the results and the conclusion.

Review of the literature

As indicated in the introduction, the analysis focuses on two criteria: performance and stability. Table 1 provides a summary of the results from eighteen studies on comparisons of bank performance and stability in relation to the origin of ownership. Firstly, in terms of performance, many studies focus on comparing bank performance through measures of profitability and/or efficiency. Studies focusing on the American market show better performance of domestic banks compared to foreign banks [DeYoung *et al.* (1996), Peek *et al.*, (1999)]. The same can be noted for Australia where foreign banks can be distinguished by better efficiency (Sathye, 2001). In a more comprehensive study including 80 countries and spanning a period from 1988 to 1995, Claessens *et al.* (2001) confirm these findings in developed countries. The results from Miller *et al.*'s, (2002) study on a sample of nine developed countries suggest that domestic banks are more efficient than those whose ownership is primarily foreign.

However, these findings still do not confirm the hypothesis that domestic banks outperform those owned by foreigners in developed countries. The findings from Vennet's (1996) study

on a sample of eleven developed countries suggest better performance of foreign banks resulting from the mergers and acquisitions movement of the 1980s and 1990s. Finally, Micco *et al.* (2007) confirm a lack of a significant difference in performance in relation to the origin of bank ownership.

These contradictory findings do not seem to be restricted to developed markets because the findings are contradictory even for developing countries. Although Chou *et al.* (2011) find a higher level of solvency for domestic banks on the Taiwanese market, Berger *et al.* (2007) bring to light an interest for the presence of foreign ownership on the Chinese market. These results corroborate those found in two other studies: one dealing with the Argentine market (Berger *et al.*, 2005), and another more recent one on the Indonesian market (Shaban *et al.*, 2018). Havrylchyk *et al.*'s (2011) study on a sample of nine Eastern-European countries found that foreign banks offered better profitability compared to domestic banks. These findings are in line with those from previous studies [Claessens *et al.* (2001), Chantapong (2005), Weill (2006), Micco *et al.* (2007)]. Finally, it should be noted that a significant impact of majority foreign ownership on performance in developing countries is still not present. For example, Bonin *et al.* (2005) observed no significant difference in terms of profitability between domestic banks and their foreign counterparts. Mian (2003) confirms these results on a sample of 100 developing countries. Bouzgarrou *et al.*'s (2018) study on the French market is particularly interesting since the findings show higher profitability of foreign banks during the crisis period. However, the findings from this study cannot lead to a decision on the outperformance of a majority foreign-owned bank during the period preceding the crisis.

Few studies have truly focused on the analysis of developed countries on a stability level. This can be explained by the lack of available data linked to regulatory capital ratios in these countries. In the case of transition countries, Lassoued *et al.* (2016) show that foreign banks in MENA³ countries are less exposed to credit risk compared to public banks which, consequently, increase their regulatory equity shares to cover the risk. Efthyvoulou *et al.*'s (2014) study on a sample of sixteen Central-European and Eastern-European countries shows that the findings can vary depending on the level of economic stability. Specifically, they observe no differences in performance in relation to the origin of bank ownership before the 2007 crisis. However, domestic banks seemed to be more exposed to credit risk during the crisis but, at the same time, more solvent compared to foreign banks.

³ Middle East and North Africa.

Table 1- Summary of the literature on performance and stability depending on the capital structure of banks (foreign/domestic)

Sources	Countries studied	Period	Focus of the study	Findings
Berger et al. (2009)	China	1994-2003	Efficiency/ Quality of credit portfolio	Foreign presence leads to better efficiency and better quality of credit portfolio
Berger et al. (2005)	Argentina	1993-1999	Profitability/ Efficiency/ Quality of credit portfolio	Foreign banks outperform both public and domestic banks
Bonin et al. (2005)	Czech Republic, Hungary, Poland, Slovakia, Bulgaria, Croatia, Romania, Slovenia, Estonia, Latvia, Lithuania	1996-2000	Profitability/ Efficiency	Foreign banks are more efficient than domestic banks. No significant difference concerning the profitability measure ROA
Bouzzagrou et al. (2018)	France	2000-2012	Profitability	Foreign banks offer better profitability during the crisis. These findings are mixed preceding the crisis.
Chantapong (2005)	Thailand	1995-2000	Profitability	Foreign banks offer better profitability compared to domestic banks (pre-tax profits and ROA).
Chou et Lin (2011)	Taiwan	2001-2006	Quality of credit portfolio / stability	Higher credit risk and/or higher risk of default for foreign banks
Claessens et al. (2001)	80 countries (developed and developing)	1988-1995	Profitability	Foreign banks outperform domestic banks in developing countries and underperform in developed countries (before tax profits/total assets)
DeYoung et al. -1996	United States	1985-1990	Efficiency	Domestic banks are more efficient than foreign banks
Efthyvoulou et al. (2014)	16 countries from Central and Eastern Europe	2002-2010	Stability/ Quality of credit portfolio	Before the crisis, difference is insignificant. During the crisis, domestic banks are more exposed to credit risk but are more solvent.
Havrylchyk et Jurzyk (2011)	Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia	1995-2003	Profitability	Profitability of foreign banks, as measured through ROA, is better than for domestic banks.
Lassoued et al. (2016)	MENA region	2006-2012	Stability and risk	Foreign banks are less exposed to credit risk and risk of failure.
Mian (2003)	100 emerging economies	1992-1999	Profitability	No difference in terms of profitability as measured by pre tax profits
Micco et al. (2007)	179 countries (developed and developing)	1995-2002	Profitability (ROA-NIM)/ operational risk	Foreign banks outperform domestic banks in developing countries. However, no significant differences in developed countries.
Miller and Richards -2002	Belgium, Denmark, France, Germany	1989-1996	Efficiency	Domestic banks offer better efficiency of profits compared to their foreign counterparts

	Italy, The Netherlands, Portugal, Spain, England			
Peek et al. (1999)	United States	1984-1997	Profitability	Domestic banks are distinguished from foreign banks by better profitability as measured by ROA
Sathye (2001)	Australia	1996	Efficiency	Domestic banks are more efficient than foreign banks
Shaban et al. [2018]	Indonesia	2005-2012	Profitability/ quality of credit portfolio	Foreign banks have a tendency to be less exposed to risk and more performant than domestic banks (state and private)
Vander (1996)	Belgium, Denmark, France, Germany Italy, the Netherlands, Portugal, Spain, England, Luxemburg, Poland	1988-1992	Profitability/ efficiency	Foreign banks outperform domestic banks in terms of profitability (ROE-ROA). No significant difference in regards to efficiency
Weill (2006)	Poland and Czeck Republic	1997	Efficiency	Foreign-owned banks offer better efficiency than domestic banks.

This review of the literature tends to show that the findings of previous studies sometimes remain contradictory and do not lead to a decision on the question of performance and stability in terms of their capital structure (foreign/domestic). Such contradictions in the findings can be explained by the differences relative to the period of analysis, to the markets studied, to the evolution of the regulatory framework or to other factors. Even though the question of profitability and stability of banks in terms of their ownership structure has been largely studied in the literature, the French market has not, to our knowledge, been the subject of any empirical analysis addressing both the question of performance and stability in the post-crisis economic context. In this perspective, the analysis is extended to a large spectrum of indicators measuring profitability, efficiency and solvency. Indeed, analysis of the risk of insolvency, synonymous with stability, leads to a vision of how French banks (foreign and domestic) have adapted to the new Basel regulation.

Data and methodology

Accounting data on French commercial banks were collected from the ORBIS Bank Focus database of Bureau van Dijk and from annual bank reports available through their respective websites. The sample was established by retaining banks that were active during the 2011-2017 analysis period and who can account for at least three years of consecutive observations. The sample was thus composed of 98 institutions of which 31 are foreign. This paper

considers a bank as foreign if the majority of shares are held by foreign agents. In this respect, it should be noted that none of the banks switched from domestic to foreign and *vice-versa* during the analysis period and that all of the banks defined as foreign remain so until the end of the analysis period. It should also be noted that the analysis period was particularly marked by a profound change on a regulatory level with the Basel III accord's entry into force *via* CRDIV⁴.

In order to measure the profitability of the banking institutions in our sample, two measures were pulled from the literature: the Return on Assets (ROA) and the Return on Equity (ROE) [Peek *et al.* (1999), Vander (1996), Berger *et al.* (2005), Bonin *et al.* (2005), Beck *et al.* (2013)]. For more robust findings, the measures of profitability were extended, and a third measure for Net Interest Margin (NIM) was integrated. NIM represents the net interest income expressed as a percentage of average assets (Shaban *et al.*, 2018). We complete our assessment of banking performance by taking into consideration accounting efficiency (CIR) [Beck *et al.* (2013), Bitar *et al.* (2016)]. The latter is calculated by relating operational expenses to operating income. A weak value of this ratio indicates a good level of efficiency for the bank.

As for the measures of banking stability, and since the data on the regulatory capital ratios were unavailable for most of the banks in our sample, the analysis of banking stability was limited to the Z-score. The Z-score is a risk measure commonly used in the empirical banking literature to reflect a bank's probability of insolvency [Beck *et al.* (2006), Boyd *et al.* (2007), Laeven *et al.* (2007), Laeven *et al.* (2009), Demirguc-Kunt *et al.* (2010), Fu *et al.* (2014)]. This Z-score indicator proposed by Hannan and Hanweck (1988) defines the probability of the bank's accounting default from its solvency. It is calculated as follows:

$$p(\text{ROA} \leq -\text{CAR}) \leq Z^2$$

$$\text{with } Z = \frac{\text{CAR} + \mu \text{ROA}}{\sigma \text{ROA}} > 0$$

A high Z-score value corresponds to a weak probability of default and *vice versa*. As suggested in previous studies, we use mean and standard deviation estimates of the return on assets that are calculated over the full sample and combine these with current values of the

⁴ The legislative package *CRD IV* designates a European regulation (*Capital Requirements Regulation – CRR*) and a directive (*Capital Requirements Directive – CRD*), transposing in European Union law the Basel III dispositions applicable starting January 1, 2014.

capital-asset ratio [Lepetit et al. (2013), Anginer et al. (2014), Barry et al. (2017), Alraheb et al. (2018)]. For more refined results, we calculate the Z-score components in accordance with previous studies [Lepetit et al. (2008), Barry et al. (2011), Köhler (2014)], and we thus define two complementary measures of stability:

$$Z_1 = \frac{\mu ROA}{\sigma ROA} \quad \text{and} \quad Z_2 = \frac{CAR}{\sigma ROA}$$

Z_1 is a proxy for asset risk, while Z_2 denotes leverage risk. An increase in Z_1 (Z_2) is associated with a decrease in asset (leverage) risk. Since Z , Z_1 , and Z_2 are highly skewed, we take into consideration the logarithms for the Z , Z_1 and Z_2 values in our model. Indeed, the natural logarithm of these variables is normally distributed and commonly used in the banking literature (Laeven and Levine, 2009).

In regards to the explanatory variables, the first one constitutes the core of our analysis. It refers to the ownership structure of banking institutions (B). This variable has a value of 1 if the bank is foreign and 0 if it is domestic. Since the ownership of the banks in our sample did not switch between foreign and domestic during the analysis period, the binary dimension of the variable B seems to be better adapted to a potential impact of majority foreign shareholding on performance than a continuous variable such as the weight of foreign shareholders. This also allows us to partially remove a potential endogeneity bias related to the presence of this variable in our models (Guglar et al., 2003).

A series of control variables were used relative to the characteristics of the banks in our sample. These variables could impact the profitability just as much as the stability of banks no matter the ownership structure.

In line with previous studies, we take into consideration the effect of the bank's size in our analysis. Even if the relation between size and return is not supposed to be linear (Athanasoglou et al., 2008), the banks that are large or "too big to fail" generally benefit from more favorable funding conditions than other credit institutions since they are (wrongly) considered to be safer. Acting as a last-resort lender, the central bank generally offers loans to banks that face systematic risk for which the too-big-to-fail banks are often responsible

(Aglietta, 2008)⁵. The size's variable is estimated by the logarithm of total assets [Bonin et al. (2005), Berger et al. (2005), Beck et al. (2013)]. We also take into account the disparities due to the structures of the banks through three indicators: the first translates the managerial function of each institution (NIE). This refers to bank expenses other than interest such as wages, loan-loss provisions, etc., on total bank assets. The second characterizes the business model adopted by the bank. It refers to the ratio (LD) expressed through the weight of loans made related to the deposits and short terms funding as a main source of funding for banks (Beck et al. [2013]). Finally, in line with previous studies, we retain the FA ratio which corresponds to fixed assets out of total bank assets [Beck et al. (2013), Lassoued et al. (2016)].

To capture the effects related to economic conditions, we retain two indicators largely used in banking economics: the growth rate of (GDP) and the inflation rate (INF).

Indeed, during a recession period, when banks are confronted with a higher capital requirement, which is the case of the entry into force of the new prudential regulation, these experiences can lead them to reduce their credit offer (Artus, 2005), thus reinforcing the recession effect (procyclical effect). It thus seems interesting to integrate GDP in our analysis which acts as common explanatory factor of domestic activity of different institutions. As for inflation rate (INF), a high growth rate and a weak inflation rate can lead to a decrease in the number of bank bankruptcies (Poghosyan et al., 2011). At the same time, a high inflation rate is generally associated with higher costs as well as greater income. If a bank's income increases faster than its costs, inflation will have a positive effect on return. However, if a bank's income increases less rapidly than its costs, a negative effect is expected (Poghosyan et al., 2011). Finally, the models are also controlled through the presence of temporal variables during the analysis period.

Table 2 shows the descriptive statistics of the variables used in our analysis. In panel A, we present the results concerning all the endogenous variables (profitability, efficiency and stability) used in our analysis. The profitability indicators are on average all positive throughout the whole sample. However, a more detailed analysis using the t test allows us to validate the hypothesis according to which domestic banks are, on average, more performant and whether this performance be measured by profitability indicators or efficiency indicators.

⁵ The English bank Northern Rock, following a risky loan policy coming mainly from securitization starting in 2000, saw their customers run to the bank counters to withdraw their equity because of the uncertainty associated with its transactions (Mayes and Wood, 2008).

Furthermore, the analysis of measure of stability allows us to note that the level of risk of insolvency of domestic banks surpasses on average that of foreign banks, thus confirming better stability for domestic banks. It should also be noted that the difference in the level of stability between the two categories of banks is also statistically significant.

Table 2- Descriptive statistics using observations of 98 banks over the 2011-2017 period

	98 banks				67 Domestic banks				31 Foreign banks				t test	Sig
	Mean	Min	Max	σ	Mean	Min	Max	σ	Mean	Min	Max	σ		
Panel A : dependent variables														
<i>ROA</i>	0.44	-11.3	11.7	1.41	0.57	-11.33	11.67	1.41	0.14	-8.03	2.85	1.38	-3.20	0.001
<i>ROE</i>	4.76	-232.5	111	20.76	7.23	-176.6	111	17.9	-1.1	-232.5	26.82	25.5	-4.23	0.000
<i>NIM</i>	2.03	-2.58	11	1.54	2.15	-2.58	9.65	1.42	1.76	-0.59	10.95	1.76	-2.60	0.010
<i>CIR</i>	68	-330	377	39.2	64.89	-330.5	214.1	32.4	75.43	-169.8	376.7	51.3	2.79	0.005
<i>Z</i>	1.58	-0.82	3.29	0.58	1.63	-0.82	3.29	0.58	1.47	-0.56	2.46	0.57	-2.97	0.003
<i>Z₁</i>	0.46	-2.8	2.02	0.57	0.55	-2.81	2.02	0.58	0.23	-1.72	1.45	0.48	-6.04	0.000
<i>Z₂</i>	1.57	-0.13	3.27	0.54	1.61	-0.13	3.27	0.54	1.47	0	2.41	0.52	-2.67	0.008
Panel B : Banking control variables														
<i>FA</i>	8.86	0.69	17	3.12	9.48	0.69	17	3.06	7.45	0.69	13.7	2.8	-7.02	0.000
<i>LD</i>	72.53	8.33	123	25.4	75.11	8.33	122.8	23.8	58.69	8.42	113.1	29.5	-4.40	0.000
<i>Size</i>	14.91	10.67	21.5	2.44	15.33	10.67	21.46	2.48	13.93	10.9	19.71	2.04	-6.13	0.000
<i>NIE</i>	3.56	0.03	34.7	3.84	2.93	0.03	34.7	2.89	5.05	0.14	23.85	5.18	5.90	0.000
Panel C : Macroeconomic control variables														
<i>GDP</i>	1.1	0.18	2.08	0.48										
<i>INF</i>	0.66	0.06	2.47	0.58										
Panel D : Instrumental variables														
<i>GE</i>	1.41	1.34	1.48	0.046										
<i>RQ</i>	1.13	1.07	1.31	0.05										

As for the values in panel B, the size of domestic banks is incontestably greater than that of foreign banks. Finally, it is interesting to note that expenses (other than interest) of foreign banks surpass that of domestic banks with a significant 2.12 point difference. These results are in line with those found by Pasiouras *et al.*, (2007) on a sample composed of 15 European

countries. Panel C processes economic condition variables. The slowest growth rate is recorded in 2012. Finally, panel D presents the instrumental variables used for the endogeneity tests explained above.

The presence of logarithms in some variables in our sample makes dynamic models more suitable. Furthermore, as the ownership of banks (foreign/domestic) did not vary during the analysis period, a random effects model seems appropriate for the analysis of our sample. The models are presented as follows:

$$f(\text{ROA, ROE, NIM, CIR})_{it} = \alpha + \beta_1 B_i + \beta_2 \text{control variable}_{it} + \varepsilon_{it} \quad (1)$$

$$f(Z, Z_1, Z_2)_{it} = \alpha + \beta_1 B_i + \beta_2 \text{control variable}_{it} + \varepsilon_{it} \quad (2)$$

with $i = 1, 2, 3 \dots 98$ $t = 1, 2, 3 \dots 7$ and ε is the measure of error

In equation 1, $(\text{ROA, ROE, NIM, CIR})_{it}$ refer to measures of the profitability and efficiency of bank i on date t . As for equation 2, the endogenous variables $(Z, Z_1, Z_2)_{it}$ correspond to the measures of stability as defined above. In both models, the control variables concern the specific characteristics of each institution and also the macroeconomic momentum.

The application of the random effects models does not eliminate the possible presence of an endogeneity problem in our models. Indeed, when we study the impact of the capital structure on bank performance, an endogeneity problem may exist. The decision to invest in banking markets in other countries is often conditioned, on one hand, by the state of the local market (quality of regulation and supervision, economic momentum, judicial framework, political stability, etc.) and, on the other hand, by the specific characteristics of the target bank (performance, quality of the portfolio, solvency, etc.). A selection bias may thus exist with the presence of foreign ownership. Previous studies indicate that banking performance can have an econometrically validated impact on the choice of investors [Himmelberg et al. (1999), Gugler et al. (2003)]. In this analysis framework, and in order to ensure the reliability of the obtained results, we proceed with additional models with the goal of detecting a possible endogeneity bias. To achieve this goal, the models are reproduced while introducing two instrumental variables which must be strongly correlated with the B variable and uncorrelated with the residuals. The first variable is regulatory quality (RQ). This indicator, on a scale from -2.5 to 2.5, assesses the actions taken by state authorities targeting the development of the

private sector (Dumpos et al, 2016). This variable is considered in the literature as an exogenous variable in regards to the analysis of the characteristics of banking institutions (Ciancanelli et al., 2001). In the same analysis framework, we consider the second variable named government effectiveness (GE). On a scale from -2.5 to 2.5, this variable allows for the assessment of the quality of public services and the credibility of the government in regards to its engagements. The values of these two variables were extracted from the *Worldwide Governance Indicators* database. We reproduce the regressions using the two-stage least square method (2SLS⁶). We use the Sargan test to verify the validity of the instrumental variables and the Hausman test to detect the possible presence of an endogeneity problem.

Findings

Table 3 reports the regression results from equation 1 designated to compare the profitability and the efficiency of foreign and domestic banks and to study the impact of the control variables on all of the institutions in our sample. In models 1 and 2, we used two standard variables of profitability: the return on assets ratio and the return on equity ratio. In line with what was observed in table 2, the results of this model show significant differences in profitability between domestic banks and foreign banks. Indeed, in the post-crisis context, domestic banks seem to offer better profitability. This is the same for the endogenous variables NIM where we observe a significant negative impact of foreign presence on net interest margin.

The analysis of the results for accounting efficiency, used as an alternative measure, also confirms these results in terms of performance. Indeed, the positive sign of the B variable translates into higher costs and/or lower income for foreign banks compared to domestic banks. These findings are in line with those validated by [DeYoung et al. (1996), Miller et al. (2002), Sathye (2001)].

On the stability level, table 4 presents the results from the estimations from equation 2. Considering the Z-score insolvency risk in model 5, the results indicate a significant negative relation ($p = 0.05$) for banks whose ownership is majority foreign. A more detailed analysis of the Z-score components allows us to note that the difference in solvency between the two categories of banks studied is due not to changes in bank assets but rather to changes in equity.

⁶ Two-Stage least squares

Table 3- Effects of ownership on the profitability of banks

Variables	<i>ROA</i>	<i>ROE</i>	<i>NIM</i>	<i>CIR</i>
	(1)	(2)	(3)	(4)
<i>B</i>	-1.029 **	-17.88***	-0.725*	14.78***
	2.33	2.967	1.882	2.972
<i>FA</i>	0.107	-0.668	-0.0276	0.11
	1.456	0.539	0.581	0.093
<i>LD</i>	-0.016***	-0.123	0.003	-0.087
	3.126	1.417	0.941	1.387
<i>Size</i>	-0.271***	-0.427	-0.194**	-0.238
	2.592	0.263	2.381	0.207
<i>NIE</i>	-0.023	-1.307**	-0.047	0.559
	0.628	2.033	1.436	1.033
<i>GDP</i>	-0.131	8.86	0.668	-1.547
	0.072	0.265	0.633	0.534
<i>INF</i>	-0.508	-4.887	-0.877**	1.374
	0.699	0.296	2.3	0.643
Constant	6.68 *	19.97	6.27***	74.23***
	1.776	0.302	2.64	6.089
Observation	329	329	326	325
Banks	98	98	98	98
Temporal variables	Included	Included	Included	Included
Sargan p.critique	0.853	0.496	0.843	0.319
Hausman p.critique	0.408	0.431	0.836	0.491
Random effects model	√	√	√	√

This table presents the results from the random effects model comparing the effects of ownership (foreign/domestic) on the profitability of French commercial banks during the 2011-2017 period. The dependent, independent and control variables were defined in the Data and Methodology section. The Sargan test verifies the validity of the instrumental variables used in the regressions. The Hausman test detects possible endogeneity problems. The numbers below coefficients designate Student standard errors providing information on the level of statistical significance of the coefficients attributed to the independent variables. *, **, *** designate the statistical significance of the coefficients at the 10%, 5% and 1% levels, respectively.

In regards to the effects of the control variables on the performance and stability of banks, it seems that size has a negative impact on the measures of bank performance as well as stability. This negative effect can be explained by the international dimension of large banks which makes them more vulnerable to exterior shocks. These banks also seem to be decked with an anti-bankruptcy shield reinforcing the “disaster myopia”⁷ (Guttentag and Herring 1986). In other words, they feel protected by the central bank from their own imprudence. Furthermore, it is interesting to remark a significant negative relation between inflation rate

⁷ Disaster myopia designates a systematic tendency toward the under-estimation of probabilities of shocks and especially those related to credit resulting from the default of one or several important borrowers.

and the endogenous variable NIM. Thus, the income from banks increases less rapidly than their costs during our analysis period.

Table 4- Effects of ownership on the stability of banks

Variables	Z (5)	Z ₁ (6)	Z ₂ (7)
<i>B</i>	-0.519** 2.491	-0.255 1.47	-0.491** 2.582
<i>FA</i>	-0.042*** 3.464	0.041 1.514	-0.024*** 2.648
<i>LD</i>	0.003*** 3.473	0.008*** 4.222	0.002*** 3.535
<i>Size</i>	-0.119*** 3.881	-0.000004 0.0001	-0.144*** 5.705
<i>NIE</i>	-0.007 1.337	0.028** 2.075	-0.008* 1.863
<i>GDP</i>	0.018 0.071	-0.579 0.871	0.077 0.398
<i>INF</i>	-0.114 1.263	0.125 0.484	-0.137** 2.004
Constant	3.86*** 5.521	0.378 0.271	4.06*** 7.31
Observation	329	329	329
Banks	98	98	98
Temporal variables	Included	Included	Included
Sargan p.critique	0.55	0.381	0.591
Hausman p.critique	0.562	0.765	0.588
Random effects model	√	√	√

This table presents the random effects model comparing the effects of ownership (foreign/domestic) on the stability of French commercial banks during the 2011-2017 period. The dependent, independent and control variables were defined in the Data and Methodology section. The Sargan test verifies the validity of the instrumental variables used in the regressions. The Hausman test detects eventual endogeneity problems. The numbers below coefficients designate Student standard errors providing information on the level of statistical significance of the coefficients attributed to the independent variables. *, **, *** designate the statistical significance of the coefficients at the 10%, 5% and 1% levels, respectively.

Finally, in order to detect a possible endogeneity bias, several complementary tests were conducted. We reproduce the model by using a two-stage least square regression model (2SLS). Beyond the control variables, we analyze two instrumental variables in the regressions (RQ and GE). The results from the Sargan test confirm the hypothesis that the instrumental variables are valid for regressions for both equation 1 and equation 2. The results from the Hausman test confirm the absence of an endogenous effect of bank ownership as it is defined on the performance and stability of banks in our sample.

Conclusion

The effects of capital structure on the performance of banking institutions have been the subject of abundant literature. The findings from the studies focusing on bank ownership and performance hardly converge. This can be explained by the differences relative to the liberalization process that is not similar for every country, to the evolution of the regulatory framework of banking system, to economic and political stability, etc. As an extension to this research, this article has analyzed the impact of ownership structure on performance and also on the stability of French commercial banks in the post-crisis context (2011-2017). From this perspective, this study focused on three categories of measures: profitability, efficiency and insolvency risk. Several tests were conducted to ensure the reliability of the results. The findings show a significant impact of the presence of majority foreign ownership on the French market. More specifically, domestic banks are distinguished by better performance whether it be assessed through measures of profitability or efficiency. These findings are in accordance with those obtained in other developed countries [DeYoung *et al.* (1996), Peek *et al.* (1999), Miller *et al.* (2002), Claessens *et al.* (2001)]. As for the level of stability of the institutions studied, domestic banks have a tendency to be more solvent than banks whose ownership is majority foreign. These findings suggest an extension of the existing literature on the impact of capital structure on banking stability. This study thus questions the necessity of reinforced monitoring of foreign banks by banking authorities on the French market in the post-crisis context and particularly after Basel III.

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