To be or not to be (in)? The question of financial conglomerate resilience*

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May 23, 2024

Abstract

In this paper, we try to assess the relative resilience of banking entities belonging to a financial conglomerate compared to other banking entities. The economic literature is rather unconclusive as regards the risk-benefit balance of economic and functional diversification in financial groups. We revisit the issue with a focus on bancassurance groups in France, by estimating four resilience measures using prudential data on a sample of more than 150 French banks over the 2010-2022 period. Our results rather confirm the strand of the literature highlighting the benefits of economic diversification in terms of higher stability and risk reduction, in particular in periods of financial stress or during the Covid-19 pandemic. By contrast, we found no significant difference in terms of level of profitability between banking entities belonging or not to a financial conglomerate. Therefore, the insurance part of financial conglomerates seems to bring stability to the banking part through risk diversification and funding complementarity but prudential supervision must ensure that the management of the insurance entity responds to its own logic in order to protect the insurer's clients.

Keywords: Banks, Financial Policy and Risk Management, Financial Stability

JEL classification: G21, G32

*The opinions expressed in the paper represent the author's personal opinions and do not necessarily reflect the views of the ACPR - Banque de France or their staff. I am grateful to Amine Tarazi for his insightful comments made during the ACPR Scientific Committee research seminar.

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1 Introduction

The French financial system is large, concentrated, diversified and characterised by the presence of large groups of "bancassurance" or financial conglomerates, combining activities of banking and insurance. In 2022, it was hosting four Global Systemically Important Banks and one Systemically Important Insurer. The existence of such large and diversified groups raises various questions in terms of profitability, resilience, diversification of risks, competition and systemic risks. France is an interesting and relevant case for analysing the issues raised by the participation in such groups as it is considered as one of the most important countries for the development of bancassurance. Moreover, it provides an interesting natural experimental set up as it includes many small and medium-sized standalone banks that can be compared with banking entities belonging to a financial conglomerate. Historically, the bancassurance model emerged in France in the 1980s as a response to the development of the life insurance market. Therefore this model addressed industrial objectives more than it pursued a diversification objective: bancassurance groups allowed their managers to optimise the branch banking network for the distribution of life insurance products. Table 1 compares the weight of bancassurance in four European countries: France, Germany, Italy and Spain. In 2021, France was the biggest market in Europe in terms of life insurance gross written premiums sourced through bancassurance with EUR 80.1 billion, followed by Italy, Germany and Spain.[1] The table shows that France is closer to Spain as regards the share of life insurance gross written premiums sold via bacassurance and the level of the top banks' CDS spreads, and to Italy as regards banking sector concentration.

Table 1: Structure of four bancassurance markets in Europe (2022)

	France	Germany	Italy	Spain
Share of life insurance gross written premiums sold via bancassurance (in %)	65	19	75	64.9
Banking sector concentration index 1/ (in %)	49.3	31.8	51.6	69.3
CDS spreads of 3 largest banks (in bps)	65.8	99.2	114.8	69.2

Sources: European insurance industry database, ECB, Bloomberg
Note: 1/ Shares of the 5 largest credit institutions in total assets

In the European Union, the identification criteria and the rules applicable to the oversight of financial conglomerates are specified in a European directive dated 2002, called "FICOD" directive. Three cumulative conditions are needed for the implementation of the FICOD status: (i) the head of the group must be a "regulated entity"; (ii) at least one entity of the group belongs to the insurance sector and at least another belongs to the banking and investment services sector; (iii) the consolidated or aggregated activities of the group in the insurance, banking and investment services sectors must be significant, with a ratio of the total balance sheet in the financial sector to the total balance sheet of the group higher than 40 percent. The list of financial conglomerates based on FICOD is updated and published annually by the the Joint Committee of the European Supervisory Authorities (ESAs)[2]. Therefore, this list provides an objective, criteria-based and

[1] Source: European insurance industry database
[2] Source: https://www.eba.europa.eu/publications-and-media/press-releases/esas-publish-list-financial-

publicly-available source for financial conglomerate identification. As regards prudential regulation, financial conglomerates are subjected to an aggregate solvency ratio, on top of the ratios that are applied at the banking level and the insurance level. In order to limit concentration risks between the banking part and the insurance part, the bank holding company must choose between two options: either deducting its shares in the financial sector exceeding 10 percent of its balance sheet from its core Tier 1 own funds or maintaining the value of its shares in the insurance sector but weighing them for credit risk as equity holding, in application of the "Danish compromise".

This paper investigates the research question of the relative resilience of French bancassurance groups in terms of volatility of profits and stability. In particular, the paper will assess the relative profitability, distance to default and level of funding costs within French financial conglomerates, as compared to banking entities not belonging to such groups. The motivation of this paper is manyfold. First, it partly addresses a recommendation from the International Monetary Fund (IMF, InternationalMonetaryFund (2019)) that requested the European Central Bank (ECB) and the French authorities in 2019 to develop liquidity risk management requirements and stress testing at the conglomerate level, in addition to the separate banking and insurance levels. Second, given the systemic nature of the large French bancassurance groups, the paper seeks to determine whether the combination of banking and insurance activity within the same group is a factor of mitigation or amplification of systemic risks, a crucial question for regulators and supervisors. Third, the results can shed light on the need or absence thereof to strengthen the oversight framework of financial conglomerates if concentration and liquidity risks are found to be enshrined in such groups.

The paper makes several contributions to the existing literature on the benefits and risks of economic diversification of financial institutions. It first merges several supervisory non-publicly available databases that allow us to cross prudential information, financial linkage data and legal entity information in a comprehensive and robust way. The sample of banks used in this paper covers more than 150 French banks on a consolidated basis, over the 2010-2022 period at a quarterly frequency. Second, to the best of our knowledge, the criterion used in the paper for financial conglomerate participation, namely the annual ESA list, has never been used in the literature on economic diversification. Third, the paper uses the interesting natural experimental set up provided by the French financial system, mixing large bancassurance groups and small and medium-sized standalone banks, as a way to implement a quasi difference-in-difference methodology and an identification strategy as robust as possible.

The results of this paper rather confirm the economic benefits of financial conglomerate membership found in a specific strand of the literature both in terms of economic diversification and resilience to financial turmoil. The paper shows that banking entities participating in such groups exhibit a lower volatility of their profitability, a lower default risk and a lower level of funding costs than banking entities not belonging to financial conglomerates. By contrast, the paper finds no significant effect of financial conglomerate membership on the level of profitability of banking entities. These results indicate that the main benefit of such participation resides in a lower level of risk rather than a higher level of profitability.

In terms of policy recommendations, the specificity of the activity of financial conglomerates re-

conglomerates-2022

quires a close cooperation between the supervisors of the different segments of the financial system (banking, insurance and financial markets), as currently carried out by integrated sectoral supervisors at the national level or by the Joint Committee of the European Supervisory Authorities. While the benefits for the banking entity of belonging to a financial conglomerate seem clear, the management of the insurance entity must respond to its own logic in order to protect the insurer's clients, and not to rescue the banking mother company in times of stress. Conversely, shareholders must be expected to rescue their subsidiary in case of a problem with the own funds of the latter. As requested by the IMF, a step further could be made by implementing regular stress tests of financial conglomerates at the highest level of consolidation in order to better identify and assess intragroup concentration risks. Finally, intragroup exposures could be subject to an increased supervisory scrutiny in order to check whether the use of large exposure limit waivers by financial groups within the European Union does not pose any financial stability risks.

The remainder of this paper is organized as follows. Section 2 presents a literature review on the costs and benefits of functional diversification and financial conglomerate membership. Section 3 sets out a theoretical model of the financial conglomerate business. Section 4 presents some descriptive statistics comparing banking entities belonging and not belonging to French bancassurance groups as well as simple correlation analysis. The results of the econometric regressions are presented and interpreted in Section 5. Section 6 concludes.

2 Literature Review

The literature on financial conglomerates and bancassurance is focused and unconclusive, reflecting the fact that bancassurance is a rather recent business model, especially in the United States where it has developed only since 1999 with the enactment of the Gramm-Leach-Bliley legislation (Ricci (2012)). Another reason might stem from the fact that it is difficult to disentangle the revenue coming from the insurance business and from the banking business in a group's income statement. That is why many papers use market data to measure performance and risks.

First, there is no consensus on the cost and benefit balance of diversification for financial conglomerates. Benefits would stem from a boost in revenue and a reduction in costs resulting from functional diversification as well as economies of scale and scope; they would exceed the costs of increased complexity and the associated agency costs (Baele et al. (2007); Boguth et al. (2022)). The effect of mergers leading to the emergence of financial conglomerates was analysed both for U.S. and non-U.S. financial institutions. Theses mergers resulted in positive gains for the shareholders of bidding firms between 1997 and 2002, with no significant increase in risks (Fields et al. (2007)). Italian banking groups in particular improved their profit efficiency in the 1990s thanks to their diversification and growth strategies that led to the building of financial conglomerates, although there was no clear indication of a cost efficiency improvement (Casu and Girardone (2004)). This resulted in a high risk-high return profile of Italian banking groups.

Another benefit could result from the complementarity in the structure of funding between banks and insurance companies: banks typically have a positive duration gap in their balance sheets. Their liabilities, made of sight deposits mostly, have a short maturity while their assets,

comprising loans to non-financial customers, have a long maturity. The opposite is true for the life insurers: their liabilities are made of long-term technical provisions whose maturity tends to exceed the maturity of their assets. Combining these two types of funding models in a consolidated structure might enable the parent company to diversify and better hedge liquidity risks. In addition, the financial conglomerate ensures the financial solidarity between the different entities of the group. Another benefit could result from business synergies, as banks' branch networks can be used to distribute insurance products, such as life insurance contracts.

Financial conglomerate membership also provides entities composing the group with a better funding stability, making financial constraints less binding, and a better resilience to financial turmoil. For example, financial conglomerate-affiliated hedge funds are found to display a lower sensitivity of flows to poor performance than other hedge funds, particularly during episodes of financial turmoil (Franzoni and Giannetti (2019)). This higher resilience stems from a more stable funding, a higher ability to capture price rebounds and the role of financial conglomerates' internal capital markets in resource reallocation and the mitigation of adverse shocks from financial markets (Matvos and Seru (2014); Almeida et al. (2015); Kuppuswamy and Villalonga (2016); Matvos et al. (2018)). Our paper has very similar findings for banks belonging to financial conglomerates. More recent papers also demonstrated the benefits of income diversification in difficult times, such as the Covid-19 pandemic, emphasising the high shock absorption of functional diversification (Simoens and Vennet (2022); Taylor (2022); Li et al. (2021); Li et al. (2020)).

Some other papers question the benefits diversification allowed by financial conglomerates or highlight higher risks. As regards financial conglomerates having a banking parent company, the new activities in which banks tend to diversify are found to be more volatile than traditional interest-bearing activity (Stiroh and Rumble (2006)). Typically, conglomerate discounts in their equity market valuation can be observed when companies divest parts of their activities that have limited synergies with their core businesses (Lamont and Polk (2002); Burch and Nanda (2003)). The use of market measures of diversification indicates that better diversification of large bank holding companies does not translate into a reduction in risks, as there is an offsetting effect between the risk-reducing potential of diversification, lower capital ratios at large bank holding companies and larger corporate loan portfolios (Demsetz and Strahan (1997)). Other papers analyse conglomerate valuations through the estimation of the Tobin's Q of conglomerate divisions (Boguth et al. (2022)) or highlight the role of internal capital markets in generating investment inefficiencies linked to frictions between conglomerate headquarters and external capital markets (Campello (2002)).

Moreover, the effect of geographic diversification on bank risk and return is found to depend on the bank's size and to be positive for small and very large banks only (Meslier-Crouzille et al. (2016)). In addition, intragroup exposures might create contagion risks and increase interconnectedness between entities. This may entail systemic risks in a financial crisis. For example, during the Global Financial Crisis (2007-2009), there was evidence of a correlation in default risks between parent banks and their subsidiaries, especially the foreign ones, due notably to the parent company's action to repatriate liquidity at the central level (Anginer et al. (2017)). However, this finding does not concern insurance subsidiaries necessarily but rather banking subsidiaries or

investment funds.

Our paper contributes to the existing literature in three ways: first, through the merger of several prudential non-publicly-available databases of French banking entities, both on a consolidated and on a solo bases; through the use of an objective criterion for determining financial conglomerate membership; and through an application to the French financial system that offers an interesting natural set-up. We analyse the relative resilience of banking entities belonging to financial conglomerates, through the use of granular data and four different transmission channels: profitability, risk-taking, distance to default and funding costs. Therefore, our methodology departs from the current literature focusing on the quantification of the conglomerate discount, as done in Boguth et al. (2022) for example, as we are not interested in conglomerate valuations and we do not use market data. Instead, we exploit the granularity and richness of prudential data available at the French banking supervisor to dig into the internal functioning of bancassurance groups.

3 Theoretical model

3.1 Set-up of the model and assumptions

The main objective of our model is to compare the expected profit of a financial conglomerate (FC) and that of a standalone bank (B), especially following a market shock. Our model is based on a representative financial conglomerate made of a banking part and of a life insurer part (LI) and on a representative bank. Both maximise their profits.

The balance sheet of the financial conglomerate is simplified. On the liability side of the banking part, there are only two funding sources: external deposits D_B, remunerated at the rate r^d, and capital or own funds K_B held by the life insurance section as part of the cross-exposures within the financial conglomerate. On the asset side, there are also two items: loans to external customers L_B, with a return r^l, and capital shares issued by the life insurance part S_B. As regards the life insurer part, its balance sheet is made of technical provisions, denoted TP_{LI} and remunerated at rate r_{LI}^{TP}, and of capital held by the banking part K_{LI}, on the liability side. The asset side of the life insurer is composed of financial market investments FI_{LI} (bonds and shares), having a return of r_{LI}^{FI}, and of shares issued by the banking part S_{LI}.

It can be illustrated by a look at the structure of the financial conglomerate's balance sheet:

Table 2: Structure of a financial conglomerate's balance sheet

	Banking part B		**Life insurer part LI**	
Assets A (rates of return)	L_B	r^l	FI_{LI}	r^{FI}
	S_B	r^s	S_{LI}	$r^{s_{LI}}$
Liabilities P (cost)	D_B	r^d	TP_{LI}	r^{TC}
	K_B	r^k	K_{LI}	$r^{k_{LI}}$
Total	$A_B = P_B$		$A_{LI} = P_{LI}$	

3.2 Financial conglomerate's profit

The financial conglomerate is assumed to maximise its profit and to behave as a mean-variance investor with risk aversion coefficient ρ and a risk-return arbitrage term as in Freixas and Rochet (2008). The profit is composed of the net interest margin coming from the banking part, of the business introducer commission, C_{LI}, brought by the insurance part and of the net financial gains of the insurance part. At the consolidated level, the internal income flows stemming from cross-exposures within the financial conglomerate are netted out.

$$\begin{aligned}\max_{L_B, D_B, FI_{LI}, TP_{LI}} \pi_{FC} = r^l L - r^d D + C_{LI} + r^{FI} FI - r^{TP} TP - \frac{\rho}{2}(\sigma_L^2 L^2 + \sigma_D^2 D^2 + 2\sigma_{DL} DL \\ + \sigma_{FI}^2 FI^2 + 2\sigma_{LFI} LFI + 2\sigma_{DFI} DFI + \sigma_{TP}^2 TP^2 + 2\sigma_{LTP} LTP \\ + 2\sigma_{DTP} DTP + 2\sigma_{FITP} FI.TP) \end{aligned} \tag{1}$$

with σ_L^2, σ_D^2, σ_{FI}^2, and σ_{TP}^2 being the variance of returns on loans, deposits, life insurer's financial investments and technical provisions, respectively, and σ_{DL}, σ_{LFI}, σ_{DFI}, σ_{LTP}, σ_{DTP} and $\sigma_{FI.TP}$ the covariance between the returns of each pairwise item.

By contrast, the profit function of a standalone bank only results from the net interest margin and can be expressed in the following way:

$$\max_{L_B, D_B} \pi_B = r^l L - r^d D - \frac{\rho}{2}(\sigma_L^2 L^2 + \sigma_D^2 D^2 + 2\sigma_{DL} DL) \tag{2}$$

We then assume a market shock ω affecting the values of the assets and their returns. Therefore, we have:

$$L_B = \tilde{L_B}(\omega) \tag{3}$$

$$r^l = \tilde{r^l}(\omega) \tag{4}$$

$$FI_{LI} = \tilde{FI_{LI}}(\omega) \tag{5}$$

$$r^{FI} = \tilde{r^{FI}}(\omega) \tag{6}$$

We can then compare the expected profit of the financial conglomerate ($E(\pi_{FC})$) and that of the standalone bank ($E(\pi_B)$):

$$
\begin{aligned}
E(\pi_{FC}) > E(\pi_B) \Leftrightarrow\ & r^{l}\tilde{(\omega)}L_B\tilde{(\omega)} - r^{d}D + C_{LI} + r^{FI}\tilde{(\omega)}FI_{LI}\tilde{(\omega)} - r^{TP}TP \\
& - \frac{\rho}{2}(\sigma_L^2 L_B\tilde{(\omega)}^2 + \sigma_D^2 D^2 + 2\sigma_{DL}DL_B\tilde{(\omega)} + \sigma_{FI}^2 FI_{LI}\tilde{(\omega)}^2 + 2\sigma_{LFI}L_B\tilde{(\omega)}FI_{LI}\tilde{(\omega)} \\
& + 2\sigma_{DFI}DFI_{LI}\tilde{(\omega)} + \sigma_{TP}^2 TP^2 + 2\sigma_{LTP}L_B\tilde{(\omega)}TP + 2\sigma_{DTP}DTP + 2\sigma_{FITP}FI_{LI}\tilde{(\omega)}.TP) \\
& > r^{l}\tilde{(\omega)}L_B\tilde{(\omega)} - r^{d}D - \frac{\rho}{2}(\sigma_L^2 L_B\tilde{(\omega)}^2 + \sigma_D^2 D^2 + 2\sigma_{DL}DL_B\tilde{(\omega)}) \qquad (7)
\end{aligned}
$$

$$
\begin{aligned}
\Leftrightarrow \sigma_{LFI} < & \frac{C_{LI} + r^{FI}\tilde{(\omega)}FI_{LI}\tilde{(\omega)} - r^{TP}TP}{\rho L_B\tilde{(\omega)}FI_{LI}\tilde{(\omega)}} \\
& - \frac{\sigma_{FI}^2 FI_{LI}\tilde{(\omega)}^2 + \sigma_{TP}^2 TP^2}{2L_B\tilde{(\omega)}FI_{LI}\tilde{(\omega)}} \\
& - \frac{\sigma_{DFI}DFI_{LI}\tilde{(\omega)} + \sigma_{LTP}L_B\tilde{(\omega)}TP + \sigma_{DTP}DTP + \sigma_{FITP}FI_{LI}\tilde{(\omega)}.TP}{L_B\tilde{(\omega)}FI_{LI}\tilde{(\omega)}} \qquad (8)
\end{aligned}
$$

Therefore, the expected profit of a financial conglomerate relatively to the standalone bank will depend on the covariance between the return of the loans and the return of the financial investments of the life insurer. This covariance has to be low enough for the conglomerate membership to be more profitable than the standalone banking status thanks to the diversification of benefits.

3.3 From model to data

As our theoretical model is unconclusive regarding the expected profitability of financial conglomerates relatively to standalone banks, we need to estimate an empirical model to measure the effect of financial conglomerate membership on various measures of profitability and resilience. Since the main conclusion from the theoretical model is that the relative profitability depends on correlation between the return on loans and the return on the life insurer's financial assets and since correlation between returns is known to increase in stress periods, the empirical part of this paper will focus on periods of financial instability. The main variable of interest in our empirical model will be the coefficient on the interaction term between a financial conglomerate membership dummy and a dummy denoting financial instability periods. The inclusion of macrofinancial and macroeconomic variables into the model will enable us to model the impact of market shocks on the value of the balance sheet and on profit of the various parts of the financial conglomerate.

4 Data and descriptive statistics

4.1 Data

Three different supervisory databases, available at the French Prudential Control and Resolution Authority (ACPR), were used for this study. We first used the regulatory reporting databases (Financial Reporting-FINREP, and the Common Reporting Framework-COREP) comprising balance sheet and prudential data on French banks on a consolidated basis for our empirical analysis, at a half-yearly and then quarterly frequency since 2010. In addition, the legal entity database includes information on the affiliation of a banking entity to a group at each date.

Publicly-available and commercial databases were used to get macroeconomic and macrofinancial data, notably the GDP growth rate in the euro area on a year-on-year basis, taken from

Eurostat (European Statistical Office), as well as financial market interest rates and indices (from Bloomberg).

Four bank-specific variables will be estimated in the empirical analysis:

- the Return on Assets (ROA), a measure of bank profitability, calculated as the ratio of the annualised net result to total assets;
- the standard deviation of the ROA over a three-year rolling window;
- the 3-year rolling Z-score, a measure of banks' default risk, calculated at the ratio of the sum of the backward moving averages of the Return on assets and the leverage ratio over a 3-year rolling window, divided by the standard deviation of the ROA over 12 quarters (see Equation 9 and Tables 4 and 5). The Z-score indicates the number of standard deviations that a bank's ROA has to fall below its expected value before its equity or own funds become depleted. Therefore, it measures a bank's default risk: the higher the Z-score, the lower the bank's probability of default.

$$Zscore_{i,t} = \frac{\overline{ROA_{i,t}} + \overline{Leverage_{i,t}}}{SdROA_{i,t}} \tag{9}$$

  where $\overline{ROA_{i,t}}+$ and $\overline{Leverage_{i,t}}$ are backward moving averages of the ROA and the leverage ratio ($\frac{Equity}{TotalAssets}$) over a 3-year rolling window.

- the average cost of debt, calculated as the ratio of the annualised interest expenses to total liabilities (excluding capital).

Our explanatory variables are the following:

- an aggregate financial variable: the spread between the 3-month Euribor rate and the Eonia swap or overnight index swap (OIS) rate , in percent. The Eonia swap rate is taken as the risk-free rate while the 3-month Euribor rate reflects banks' funding costs and the transmission of monetary policy. The spread between the two rates is a standard indicator of banks' default risk and liquidity risk, as valued by financial markets. We identify periods of high level of the Euribor-OIS swap rate spread with a dummy variable equal to 1 when the current value of this spread exceeds the 75th percentiale of the distribution (value of 0.27 percentage points or 27 basis points). They denote periods of higher financial instability and risk aversion. We expect a positive sign on the coefficient of this variable for the estimation of the standard deviation of the ROA: as investors' risk aversion gets higher, the financial situation becomes more unstable and benefits should become more volatile. A negative sign is expected on the coefficient of this variable in the estimation of banks' profitability and the Z-score as an increase in the perceived bank default risk should increase banks' funding costs and reduce their profits. The relevance of using the Euribor-Eonia swap rate spread as a proxy for risk and instability for the banking and the insurance sectors is shown by the significantly positive correlation coefficient between this variable and the cost of banks' debt (0.29) and the negative correlation coefficient with the growth of banks' debt (-0.06). Moreover, the time

profiles of banks' (weighted average) cost of debt and growth of debt show that the latter decreases in periods of rising Euribor-Eonia swap rate spread, while the former increases in such periods (Figure1 and Figure2). This provides evidence of banks suffering from a drain of liquidity during periods of high Euribor-Eonia swap rate spread.

- a monetary policy variable: the size of the European Central Bank (ECB) balance sheet, taken in logarithm, aimed at capturing the effect of the ECB unconventional liquidity injections, that were implemented after the 2007/2008 global financial crisis due to the zero lower bound constraint on policy rates. This variable is expected to have a positive effect on banks' profitability and on their Z-score as it is assumed to reduce their funding costs;

- a macroeconomic variable, namely the euro area GDP growth, taken from Eurostat, the European Statistical Office. This variable is expected to have a positive effect on the Z-score as a more buoyant economic activity is supposed to result in higher financial income and to reduce credit risk, and an ambiguous effect on net result growth volatility and on funding costs;

- bank-specific control variables taken from the FINREP/COREP databases. They comprise a risk variable captured by the average risk density of a bank's assets, defined as the ratio of risk-weighted assets to total assets; the nonperforming loan ratio, taken as a risk variable and calculated as the ratio of nonperforming loans to total loans to the non-financial customers; the solvency ratio calculated as the ratio of total own funds to risk-weighted assets; the size of the institution; and a ratio capturing the bank's business model, namely the share of loans to non-financial customers in total assets, that can be also seen as the inverse of a liquidity ratio. Indeed, loans to non-financial customers are the least liquid assets in a bank's balance sheet. The size variable at the consolidated level is meant to capture the systemic importance of the entity that may have an impact on the likelihood of government implicit guarantees when market conditions deteriorate. It is then important to control for this factor as we could otherwise too quickly attribute a stabilization effect that comes from market expectations of governement bailout during periods of higher risk aversion to an entity's membership of a financial conglomerate. All bank-specific control variables are lagged to avoid endogeneity issues;

- and a dummy variable for financial conglomerate membership built from the "Etat civil" database and the annual list of financial conglomerates published by the European Banking Authority: it takes the value of 1 for the entities belonging to the twelve financial conglomerates identified by the FICOD directive and having an activity in France: AXA Group, ABN AMRO, Allianz Group, BNP Paribas, BPCE, Groupe Crédit Agricole, Groupe Crédit Mutuel, HSBC Continental Europe, La Banque Postale, Société Générale, Generali, Groupe Milleis. The dummy variable takes the value of 0 for the other entities. As the list of financial conglomerates is updated annually by the ESAs, it is time-varying, albeit pretty stable.

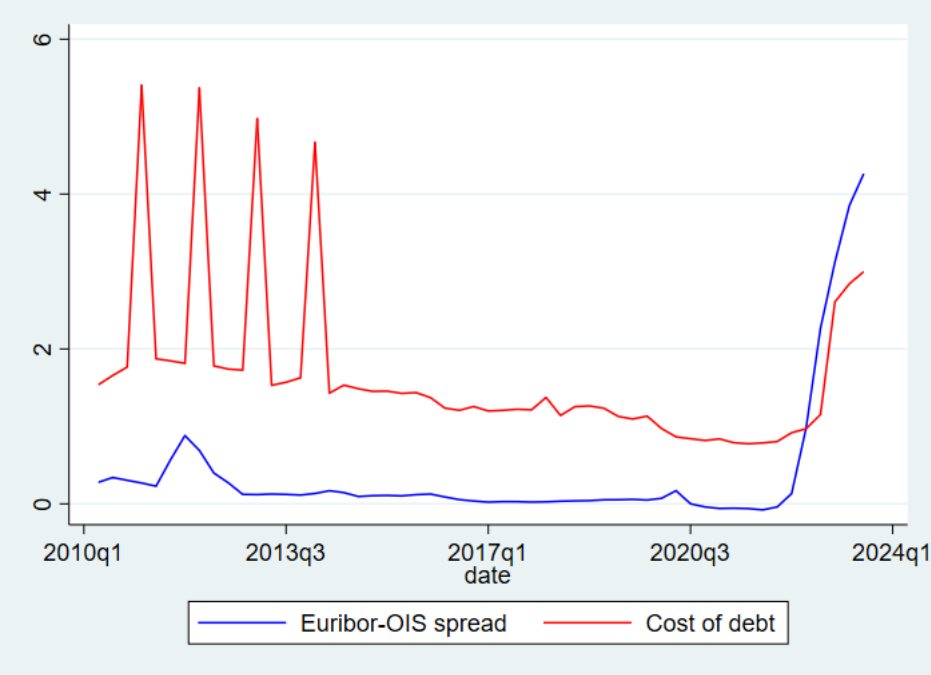

Figure 1: Time profile of banks' cost of debt and the Euribor-Eonia swap spread
Source: ACPR

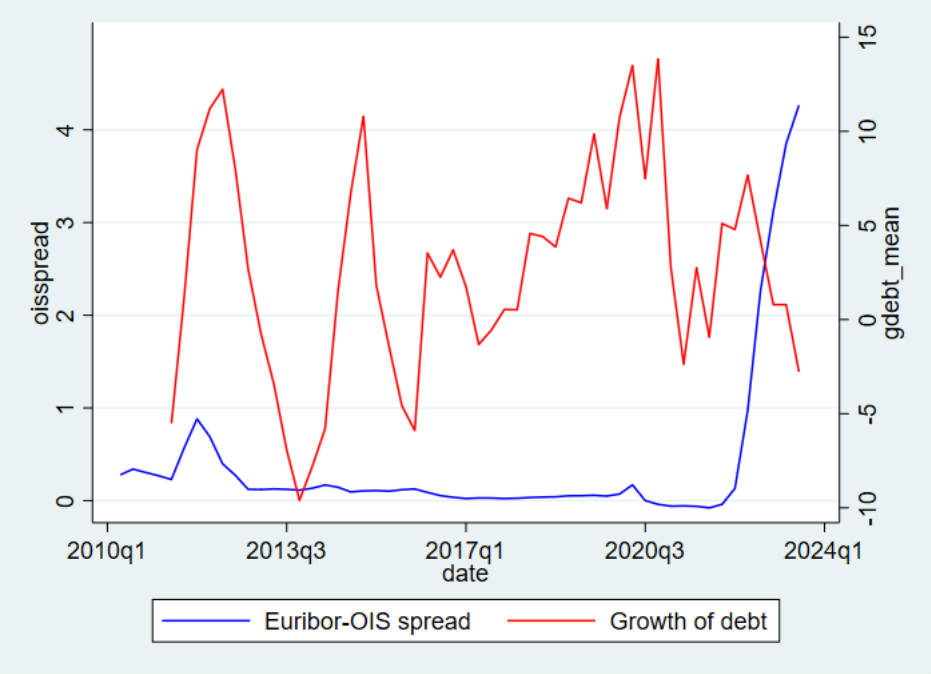

Figure 2: Time profile of the growth of banks' debt and the Euribor-Eonia swap spread
Source: ACPR

Table 3: **Variables composing the different estimated models**

Dependent variable	Description and source	Target variables	Description and source	Control variables	Description and source
Return on Assets (ROA)	Ratio of the bank's annualised net result to total assets, source: FINREP	Dummy for financial conglomerate membership	Value of 1 if the bank belongs to one of the financial conglomerates listed annually by the Joint Committee of the European Supervisory Authorities; 0 otherwise, sources: legal entity database and https://www.eba.europa.eu/esas-publish-list-financial-conglomerates-2022	GDP growth rate	Year-on-year euro area GDP growth rate in %, source: Eurostat
		Dummy for high Euribor-OIS spread periods;	Value of 1 if the average spread exceeds 27 bps in the current quarter; 0 otherwise, source: Bloomberg;	Euribor-OIS spread	Spread btw. the 3-month Euribor rate and the Eonia swap rate in %, source: Bloomberg
		Interaction term between the two dummy variables	Product between the two dummy variables above-mentioned	European Central Bank balance sheet size	ECB total assets in logarithm, source: Bloomberg
				bank's size	ratio of the bank's total assets divided by the banking sector total assets at date t, source: FINREP
				bank's risk density	ratio of the bank's risk-weighted assets divided by the bank's total assets, sources: COREP/FINREP
				bank's solvency ratio	ratio of the bank's own funds divided by the bank's risk-weighted assets, source: COREP
				bank's loan share in total assets	ratio of the bank's loans to nonfinancial customers divided by the bank's total assets, source: FINREP

Source: author's compilation

Table 4: **Variables composing the different estimated models (continued)**

Dependent variable	Description and source	Target variables	Description and source	Control variables	Description and source
Standard deviation of the ROA	Standard deviation of the ROA over a 3-year backward rolling window, source: FINREP	same as above	same as above	same as above	same as above
Z-score	Ratio of the sum of the backward moving averages of the ROA and the leverage ratio over a 3-year rolling window, divided by the standard deviation of the ROA over 12 quarters, sources: COREP/FINREP	same as above	same as above	same as above	same as above
Funding costs	Ratio of the bank's total interest expenses to total liabilities source: FINREP	same as above	same as above	same as above	same as above
Source: author's compilation					

4.2 Descriptive statistics

As regards the comparison between institutions belonging to a financial conglomerate and other banking institutions, every bank-specific variable has been winsorized at the 5th and 95th percentiles to get rid of extreme values. The difference between the two groups are always statistically significant, except for the non-performing loan ratio, but not always very large (see Table 5). On average, entities that belong to a financial conglomerate exhibit a larger size than the others in terms of total assets. As for the aggregate size, the total asset share of entities belonging to a financial conglomerate amounts to 91 percent of the total banking sector assets over the whole period of observation, reflecting a concentration trend.

As regards the bank-specific control variables other than size, entities belonging to a financial conglomerate display a lower average risk density. By contrast, the solvency ratio and the share of loans to the non-financial customers in total assets, taken as an indication of the bank's business model, are higher for entities belonging to a financial conglomerate. This likley reflects the more specialised activity of entities outside financial conglomerates.

Table 5: **Descriptive statistics of the main variables- Differences between entities belonging and not belonging to a financial conglomerate**

Dummy variable: Conglo or Non-conglo	Conglo: Obs	Conglo: Mean	Conglo: SD	Nonconglo: Obs	Nonconglo: Mean	Nonconglo: SD	Difference: Mean	Difference: Std. Error	t-test
Model variables									
ROA (in %)	5,361	0.58	0.49	1,503	0.97	1.04	-0.40	0.02	-20.84***
Sd_ROA (in %)	5,358	0.28	0.22	1,585	0.42	0.39	-0.14	0.01	-18.35***
Z-score	3,968	48.07	29.49	769	37.58	29.25	10.49	1.16	9.04***
Funding cost (in %)	5,361	1.71	1.31	1,503	1.81	1.79	-0.10	0.04	-2.51**
Size (asset market share, in %)	5,361	0.94	2.42	1,503	0.32	0.87	0.62	0.07	9.76***
Solvency ratio (in %)	5,600	38.29	43.23	1,638	32.61	37.66	5.68	1.18	4.81***
Risk density (in %)	5,251	32.96	17.83	1,423	47.89	27.40	-14.94	0.61	-24.68***
Loan share in total assets (in %)	5,361	60.56	18.01	1,503	30.59	31.98	29.96	0.64	47.00***
NPL ratio (in %)	5,353	2.80	1.65	1,382	2.80	2.87	-0.01	0.06	-0.09

Source: ACPR

A correlation analysis between the ROA, its standard deviation, the Z-score, the average funding costs, macrofinancial variables and the bank-specific control variables shows a moderate but significant correlation (see Table 6). It should be noted that size is negatively correlated with the return on assets, the volatility of the ROA and the level of funding costs, but positively correlated with the Z-score.

Table 6: **Correlation between main variables**

	ROA	SdROA	Z-score	Funding costs	Size	Solvency ratio	Risk density	Loan share	NPL Ratio	GDP Growth	Euribor-OIS spread	ECB BS size
ROA	1.0000											
SdROA	0.3280*** (0.0000)	1.0000										
Z-score	-0.2593*** (0.0000)	-0.7068*** (0.0000)	1.0000									
Funding costs	0.1959*** (0.0000)	0.2248*** (0.0000)	-0.2333*** (0.0000)	1.0000								
Size	-0.1544*** (0.0000)	-0.1606*** (0.0000)	0.0920*** (0.0000)	-0.0263** (0.0295)	1.0000							
Solvency ratio	0.1669*** (0.0000)	0.3163*** (0.0000)	-0.1911*** (0.0000)	0.2633*** (0.0000)	-0.0481*** (0.0001)	1.0000						
Risk density	0.1819*** (0.0000)	0.0913*** (0.0000)	-0.0799*** (0.0000)	-0.1884*** (0.0000)	-0.1763*** (0.0000)	-0.5575*** (0.0000)	1.0000					
Loan share	-0.1118*** (0.0000)	-0.0007 (0.9576)	0.1025*** (0.0000)	0.0718*** (0.0000)	-0.2216*** (0.0000)	-0.0092 (0.4530)	0.0984*** (0.0000)	1.0000				
NPL ratio	-0.0127 (0.2964)	0.1889*** (0.0000)	-0.1595*** (0.0000)	0.1871*** (0.0000)	0.0438*** (0.0003)	-0.0555*** (0.0000)	0.3011*** (0.0000)	0.3810*** (0.0000)	1.0000			
GDP growth	0.0718*** (0.0000)	-0.0524*** (0.0000)	0.0105 (0.4719)	-0.0679*** (0.0000)	0.0015 (0.9012)	-0.0914*** (0.0000)	0.0636*** (0.0000)	0.0076 (0.5321)	-0.0231* (0.0587)	1.0000		
Euribor-OIS spread	-0.0503*** (0.0000)	-0.0640*** (0.0000)	0.0092 (0.5252)	0.1657*** (0.0000)	0.0267** (0.0269)	-0.0134 (0.2541)	-0.0585*** (0.0000)	0.0130 (0.2804)	-0.0997*** (0.0000)	-0.0679*** (0.0000)	1.0000	
ECB BS size	-0.1804*** (0.0000)	-0.3188*** (0.0000)	0.3937*** (0.0000)	-0.3574*** (0.0000)	-0.0126 (0.2981)	-0.3330*** (0.0000)	0.1338*** (0.0000)	0.0239** (0.0476)	-0.2341*** (0.0000)	0.0846*** (0.0000)	0.3410*** (0.0000)	1.0000

Note: p-values are mentioned in brackets, as an indicator of confidence.
*** p<0.01, ** p<0.05, * p<0.1.
Sources: ACPR, Eurostat and Bloomberg - Author's calculations.

Finally, Figures 3 and 4 present the parallel time profiles of the (unweighted) average ROA and Z-score for entities belonging to a financial conglomerate and those not belonging to such a group since 2010, respectively. Figure 3 shows a similar time profile of the ROA series for the two groups of entities, although the ROA of entities not participating in financial conglomerates stands at a higher level than that of participating entities over the almost entire period, except at the most recent date. As for Figure 4, the Z-score of entities belonging to a financial conglomerate has been standing at a higher level than that of non participating entities since 2014, date at which some entities joined a financial conglomerate and a new reporting framework entered into force (this structural break is taken into account in the econometric analysis).

5 Empirical estimation

5.1 Model set-up

We now want to determine whether the participation of a banking entity in a financial conglomerate has an impact or not on the ROA and the standard deviation of the ROA, its Z-score, taken as a measure of default probability, and on the level of funding costs. To that end, we estimate four models with the four different dependent variables above mentioned. Our explanatory control variables are macroeconomic, financial and bank-specific as we want to determine the sensitiveness of resilience measures to changes in macroeconomic and financial conditions.

Our models are estimated on a quarterly basis. Therefore, we calculated simple quarterly averages for series having a higher frequency, namely financial variables, and interpolated banks' income statement items that have a lower (half-yearly) frequency. We end up with a panel of more than 150 banks and around 6,000 observations for the estimation of the Return on Assets. Among these observations, there are 10 points at which an entity entered a financial conglomerate and 4 at which an entity exited a financial conglomerate (around 0.3 percent of total number of observations). The period of estimation spans from 2010Q1 to 2022Q4.

We estimate a panel model with fixed effects. The reduced form of our equations can be read as follows for bank i:

$$Y_{i,t} = \phi dconglo_{i,t} + \delta dhighspread_t + \eta dhighspread_t * dconglo_{i,t} + \beta X_t + \lambda Z_{i,t-1} + \alpha + \sigma_i + \gamma_t + \epsilon_{i,t} \quad (10)$$

where Y is the dependent variable; *dconglo* a dummy variable denoting financial conglomerate membership; *dhighspread* a dummy variable denoting periods of financial instability; $dhighspread_t * dconglo_{i,t}$ an interaction term between the high spread dummy variable and the financial conglomerate dummy; X a vector of explanatory macroeconomic variables; Z a vector of bank-specific control variables; α the intercept, σ_i denotes individual bank fixed effects, meant to capture unobserved time-invariant bank heterogeneity; γ_t time fixed effects; ϵ the vector of error terms; ϕ, δ, η, β, and λ are vectors of coefficients to be estimated.

In this equation, our variable of interest is η, the coefficient of the interaction term between the financial conglomerate membership and the high spread dummy variables as we want to shed light

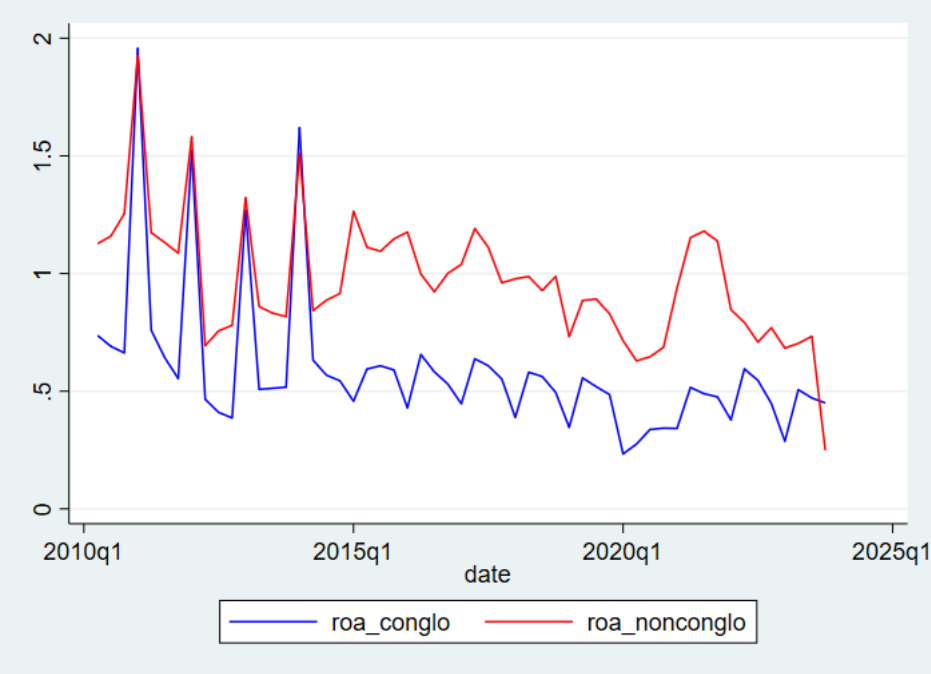

Figure 3: Evolution of the ROA for banking entities belonging to a financial conglomerate and other banking entities

Source: ACPR

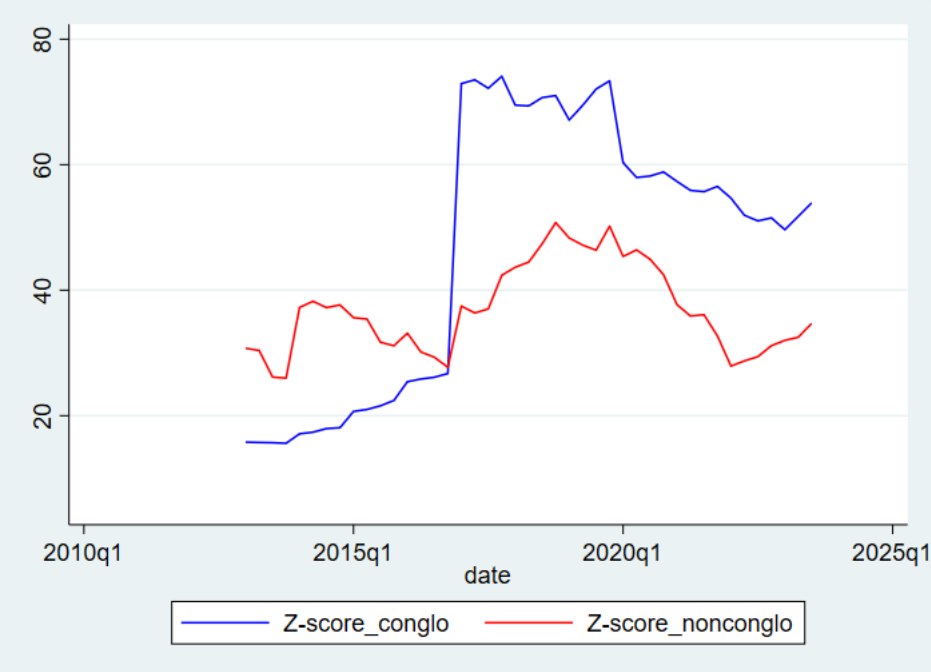

Figure 4: Evolution of the Z-score for banking entities belonging to a financial conglomerate and other banking entities

Source: ACPR

on the impact of financial conglomerate membership on the volatility of profitability and default risk in financial instability periods. In an ideal set-up, we would have liked to design a natural experiment by estimating a difference-in-difference model. However, we were not able to identify an exogenous event affecting entities composing a financial conglomerate specifically. Therefore, we tried to implement an alternative approach as a proxy in which exogenous events are identified by periods of financial instability. The identification relies on a between-approach rather than on a within-approach and on the banks that entered or exited a financial conglomerate during the period of observation.

Moreover, one could consider that a bank's decision to enter a financial conglomerate is itself endogenous and might depend on the performance and strategy of the head of the group and the entity itself. In that case, the financial conglomerate membership could be correlated with the error term. To remedy this bias, we tried to carry out a Heckman correction (Heckman (1979)) based on a two-step approach and to estimate an instrumental variables model in which the financial conglomerate membership dummy was instrumented by the same macroeconomic and bank-specific control variables as in the main equation. However, the number of entries into and exits from a financial conglomerate was found to be too low compared to the total number of observations (slightly less than 0.3 percent of total number of observations) to really change the results of the main equation. Moreover, in a logit estimation, the financial conglomerate dummy variable was not found to be significantly affected by the explanatory variables included in the main equation. Instead, we decided to estimate equation 10 using a simple instrumental variable model. For the participation of a banking entity in a financial conglomerate, we used the number of years since financial liberalisation was first implemented in the country in which the bank's headquarter is located as an instrument. 1983 was taken as the first year of financial liberalisation in France and the United Kingdom as that year corresponds to the date at which laws were passed in France to unify the status of credit institutions and to allow economic actors to issue debt securities, 1985 for Italy, 1986 for the Netherlands and 1987 for Germany (source: Abiad et al. (2008)). These reforms led to the emergence of bancassurance groups and the development of the life insurance market associated with the market funding of the French government. This instrument was found to be correlated with the participation of a banking entity into a financial conglomerate at a given date but not with measures of banks' resilience and profitability. Our instrumental strategy is close to the one used by Meslier-Crouzille et al. (2016) who used the years in which U.S. states liberalised their interstate banking laws as instruments for American banks' geographic diversification.

Finally, given that we exploit variation over time and across banks but our main variable of interest is at the bank-level, we decided to cluster standard errors at the bank-level.

5.2 Results

We first examine the baseline estimation of the Return on Assets, a standard measure of profitability normalised by the bank's assets. Results are displayed in Table 7 and distinguish two types of interactions: interactions between financial conglomerate membership and high spread periods in column 1, interactions between financial conglomerate membership and the Covid-19 pandemic

(2020/2022Q2) period in column 2. At first glance, our results do not confirm the findings of Simoens and Vennet (2022); Taylor (2022); Li et al. (2021) on the benefits of economic diversification during the Covid-19 pandemic, nor during every period of financial stress. Indeed, the results in columns 1 and 2 indicate an absence of any significant impact of financial conglomerate membership either in periods of high spread or during the Covid-19 pandemic. This means that there is no statistically different impact of financial conglomerate membership between the pre-Covid period and the 2020/2022 period, nor between low spread and high spread periods.

The absence of a clear impact of financial conglomerate membership on banks' profitability over the whole period of observation requires further investigation.

Table 7: **Results of the estimation of the ROA**

VARIABLES	(1) Whole period	(2) Covid interaction
$d_{Highspread} * d_{Conglo}$	0.066	
	(0.059)	
d_{Conglo}	-0.123	-0.071
	(0.196)	(0.202)
$d_{Highspread}$	1.085**	
	(0.520)	
$d_{Covid} * d_{Conglo}$		-0.149
		(0.106)
d_{Covid}		-1.012*
		(0.548)
GDP	-0.396***	-0.396***
	(0.104)	(0.104)
EUR-OIS spread	-2.184***	-2.179***
	(0.794)	(0.795)
ECB	0.893**	0.892**
	(0.343)	(0.342)
$Size_{t-1}$	-0.133***	-0.135***
	(0.050)	(0.049)
Risk $density_{t-1}$	0.002	0.002
	(0.003)	(0.003)
NPL $ratio_{t-1}$	-0.012	-0.015
	(0.019)	(0.019)
Solvency $ratio_{t-1}$	0.002***	0.002***
	(0.001)	(0.001)
Loan $share_{t-1}$	-0.004	-0.004
	(0.004)	(0.004)
Constant	-5.238**	-4.129*
	(2.633)	(2.118)
Bank Fixed Effects	YES	YES
Time Fixed Effects	YES	YES
Observations	5,889	5,889
R-squared	0.439	0.441
Number of banks	156	156

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sources: ACPR, Eurostat and Bloomberg - Author's calculations

Next, we want to measure bank risk-taking to determine whether financial conglomerate mem-

bership can increase moral hazard by incentivising banks to take on more risks due to the insurance that they would be backed by the group. To that end, we estimate the standard deviation of the ROA over a 3-year backward rolling window. Results are presented in Table 8. With this dependent variable, the results of the estimation involving the interactions between financial conglomerate membership and periods of high spread (column 1) are different from the results of the estimation involving the interactions between financial conglomerate membership and the Covid period (column 2). In column 1, the (weakly) significant and negative coefficient on the financial conglomerate membership dummy (-0.11) shows that financial conglomerate participation has a dampening effect on the volatility of the ROA. However, this effect is not statistically different between periods of high spread and periods of low spread as the coefficient on the interaction term between the financial conglomerate membership and the high spread dummies is not significant. The negative coefficient of the financial conglomerate dummy invalidates the moral hazard assumption but might also reflect the possibility given to the insurers to smooth their results over three years, which is likely to impact the volatility of the net result of the group they belong to. In periods of high spread, the financial conglomerate membership is associated with a reduction in the standard deviation of the ROA by 0.08 percentage points (-0.112-0.036) or 8 basis points.

The effect of the interactions with the Covid period is not visible (column 2). Indeed, the insignificant coefficients of both the financial conglomerate membership dummy and of the interaction term between this dummy and the Covid period dummy indicate that there is no significant effect associated with financial conglomerate participation, before or during the Covid period, on the volatility of the banking entity's result volatility. At the same time, the insignificant coefficient on the Covid dummy might reflect the effect of the extraordinary and very large government mesures taken during this period to protect the economy and the borrowers, in particular, the moratoria on the reimbursement of bank loans and the government-guaranteed loans to non-financial corporations.

We then estimate the Z-score, a comprehensive profit resilience measure, whose results are displayed in Table 9, as an alternative specification. As explained before, the Z-score is a finer measure of a bank's resilience than the ROA or the standard-deviation of the ROA as it takes into account the level of capital and is risk-adjusted. With this dependent variable, the results of the estimation involving the Euribor-OIS spread interaction are similar to those involving the Covid interaction, even though high spread periods and the Covid period seem to have opposite effects on banks' Z-score. In the first case, financial conglomerate membership is associated with a significantly higher Z-score of banks, and thus with a lower default risk (column 1). When we add the significantly positive coefficient on the financial conglomerate membership (11.33) and the positive but insignificant coefficient on the interaction term between this dummy and the high spread dummy variable (2.51), we find a largely positive effect of the financial conglomerate membership on the Z-score in times of financial turmoil. In periods of high spread, the financial conglomerate membership is thus associated with an increase in the Z-score by 13.8 standard deviations of the ROA, a very large increase. The fact that the coefficient of the financial conglomerate dummy remains significant despite the presence of the bank's size variable in the model provides some

Table 8: **Results of the estimation of the 3-year rolling Std. dev. of the ROA**

VARIABLES	(1) Whole period	(2) Covid interaction
$d_{Highspread} * d_{Conglo}$	0.036	
	(0.041)	
d_{Conglo}	-0.112*	-0.099
	(0.065)	(0.068)
$d_{Highspread}$	-0.172*	
	(0.092)	
$d_{Covid} * d_{Conglo}$		-0.028
		(0.072)
d_{Covid}		0.165
		(0.111)
GDP	0.031*	0.031*
	(0.016)	(0.016)
EUR-OIS spread	0.236*	0.236*
	(0.132)	(0.132)
ECB	0.047	0.047
	(0.061)	(0.061)
$Size_{t-1}$	-0.054**	-0.054**
	(0.025)	(0.025)
Risk $density_{t-1}$	0.001	0.001
	(0.001)	(0.001)
NPL $ratio_{t-1}$	0.020**	0.019*
	(0.010)	(0.010)
Solvency $ratio_{t-1}$	0.001***	0.001***
	(0.000)	(0.000)
Loan $share_{t-1}$	0.001	0.001
	(0.001)	(0.001)
Constant	-0.395	-0.544
	(0.496)	(0.423)
Bank Fixed Effects	YES	YES
Time Fixed Effects	YES	YES
Observations	5,909	5,909
R-squared	0.546	0.546
Number of banks	156	156

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sources: ACPR, Eurostat and Bloomberg - Author's calculations

reassurance as to the specific effect of the group particiaption on the entity's stability, as the potential impact of government implicit guarantees is captured through the size of the entity.

The results are comparable when we take into consideration the developments of the Covid-19 pandemic (column 2), although the effect of the Covid-19 period of the banks' stability is opposite to the effect of high spread periods. In this specification, the effect of financial conglomerate membership on banks' Z-score remains positive, albeit only weakly significant (with a coefficient of 10.82), and the coefficient of the interaction term between the financial conglomerate dummy and the Covid-19 dummy variable is positive but insignificant, as previously. This result confirms the recent literature pointing to the benefits of economic and functional diversification on banks' resilience during the recent pandemic. The opposite effect of the Covid period on banks' Z-

score, reflected in the very significantly negative coefficient of the Covid-19 dummy, compared to the high spread dummy, might be explained by the impact of government and monetary policy support measures which tried to compress credit spreads and to stabilise the economy. A simple t-test showed that the size of the Euribor-OIS spread is statistically different between the pre- and post-Covid periods and significantly higher in the period preceding the pandemic and the couple of months succeding it (with a mean of 0 during the Covid pandemic, as compared to 0.53 percentage points before and after).

Table 9: **Results of Z-score estimation**

VARIABLES	(1) Whole period	(2) Covid interaction
$d_{Highspread} * d_{Conglo}$	2.509	
	(5.012)	
d_{Conglo}	11.332**	10.824*
	(5.588)	(5.639)
$d_{Highspread}$	44.557***	
	(11.178)	
$d_{Covid} * d_{Conglo}$		1.590
		(5.847)
d_{Covid}		-72.797***
		(17.704)
GDP	2.120***	-9.725***
	(0.379)	(3.114)
EUR-OIS spread	-68.022***	-103.995***
	(17.956)	(26.786)
ECB	50.658***	129.737***
	(10.308)	(29.523)
$Size_{t-1}$	0.595	0.607
	(5.067)	(5.067)
Risk $density_{t-1}$	0.278**	0.279**
	(0.118)	(0.116)
NPL $ratio_{t-1}$	-3.296***	-3.254***
	(1.235)	(1.203)
Solvency $ratio_{t-1}$	0.076***	0.077***
	(0.028)	(0.028)
Loan $share_{t-1}$	0.313*	0.310*
	(0.177)	(0.172)
Constant	-410.266***	-1,037.293***
	(82.251)	(233.844)
Bank Fixed Effects	YES	YES
Time Fixed Effects	YES	YES
Observations	4,188	4,188
R-squared	0.586	0.586
Number of banks	143	143

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sources: ACPR, Eurostat and Bloomberg - Author's calculations

Finally, we estimate the banks' funding costs in order to assess the effect of financial conglomerate membership on liquidity stability. Results are shown in Table 10 and are more significant

than in previous specifications when we look at the interactions between financial conglomerate membership and high spread periods (column 1) or the Covid-19 period (column 2). Financial conglomerate membership is found to significantly reduce the banks' average funding cost in times of turmoil, in line with the literature pointing to higher funding stability in such groups. In periods of high spread, the financial conglomerate membership is associated with a decline in funding costs by 0.34 percentage points (-0.587+0.245, column 1) or 34 basis points. The effect is found to be even larger and more significant when we focus on the Covid-19 period with a decline associated with financial conglomerate membership on funding costs by 0.76 percentage points (-0.469-0.294, column 2) or 76 basis points. Overall, the effect of the financial conglomerate membership on funding costs seems to be non-linear and to be significantly stronger in periods of financial turmoil measured by the size of the Euribor-OIS spread.

5.3 Additional analysis of financial groups' internal capital markets

In order to isolate the effect of financial conglomerate membership on banking stability and to disentangle it further from larger external effects such as government implicit guarantees, accounting rules or monetary policy operations, we decided to investigate into the functioning of bancasurance groups' internal markets in stressed periods, as compared to other banking groups. To that end, we estimated a Panel Vector Autoregression (PVAR) model since 2010 to derive the Impulse Response functions of the intragroup funding growth to a external financial shock, captured by a rise in the Euribor-Eonia swap rate spread. As we are interested in intragroup funding, we had to switch to a database on an individual or legal entity level in order to map intragroup transactions. As our panel data model is characterised by a large number of observations over groups and time periods as well as the presence of the lagged dependent variable, it is subject to both dynamic heterogeneity and cross-sectional dependence at the same time. To address these issues, we chose the estimation options of the PVAR in such a way as to be as close to the set-up of the Dynamic Common Correlated Effects estimation, proposed by Holly et al. (2010) and Chudik and Pesaran (2015), as possible and with the same explanatory variables as in our previous estimations. However, the cross-sectional mean was subtracted from each variable in the model before estimation in order to remove common time fixed effects from all the variables. Moreover, the panel-specific fixed effects were removed using first difference instead of forward orthogonal deviations. We used "GMM-style" instruments as proposed by (Holtz-Eakin et al., 1988) with the fifth and sixth lags of each bank-specific variable and the current value of exogenous macrofinancial variables used as instruments.

Based on the result of the PVAR estimation, we computed Impulse Response Functions (IRFs), or responses of the endogenous variable (the year-on-year growth rate in the intragroup funding at the individual entity level) to a shock to our main exogenous financial risk variable (the spread between the 3-month Euribor rate and the Eonia swap rate in periods of high spread). We successively considered the impacts of *(i)* a shock to the spread for a banking entity belonging to a financial conglomerate (see Figure 5) and *(ii)* for a banking entity not belonging to a financial conglomerate (see Figure 6). In practice, we generated orthogonalised shocks that occur on one of

Table 10: Results of estimation of Funding costs

VARIABLES	(1) Whole period	(2) Covid interaction
$d_{Highspread} * d_{Conglo}$	0.245*	
	(0.132)	
d_{Conglo}	-0.587*	-0.469
	(0.311)	(0.316)
$d_{Highspread}$	-0.860***	
	(0.223)	
$d_{Covid} * d_{Conglo}$		-0.294**
		(0.140)
d_{Covid}		0.905***
		(0.213)
GDP	0.107**	0.107**
	(0.042)	(0.042)
EUR-OIS spread	1.023***	1.029***
	(0.319)	(0.322)
ECB	-1.272***	-1.275***
	(0.171)	(0.172)
$Size_{t-1}$	-0.311**	-0.311**
	(0.151)	(0.148)
Risk $density_{t-1}$	-0.006	-0.006
	(0.005)	(0.005)
NPL $ratio_{t-1}$	0.016	0.009
	(0.031)	(0.031)
Solvency $ratio_{t-1}$	-0.000	-0.000
	(0.001)	(0.001)
Loan $share_{t-1}$	-0.010**	-0.009*
	(0.005)	(0.005)
Constant	13.310***	12.582***
	(1.345)	(1.196)
Bank Fixed Effects	YES	YES
Time Fixed Effects	YES	YES
Observations	5,889	5,889
R-squared	0.830	0.831
Number of banks	156	156

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Sources: ACPR, Eurostat and Bloomberg - Author's calculations

components, interpreted as innovations. We thus observe the response of an other component to this shock, all other shocks being equal to zero. In both figures, the 90 percent confidence bands are based on Monte Carlo simulations with 200 draws. They are drawn around the median IRF. We can see that the confidence interval crosses the x-axis for the response of the intragroup funding growth to a spread shock immediately for banks not belonging to a financial conglomerate, reflecting low significance, although the response of the intragroupe funding growth to a spread shock seems to be significantly different from 0 at step 1 for banks belonging to a financial conglomerate.

The impact of a spread shock is positive and significant on the intragroup funding growth for banks belonging to a financial conglomerate, but only for the first two periods. In contrast, the response of the intragroup funding growth to a spread shock for banks not belonging to a

financial conglomerate is not significant. This difference shows that the bancassurance groups' internal capital markets act as a shock absorber in response to a shock to funding spreads as the intragroup funding increases in periods of high spread, whereas the reponse of intragroup funding is not found to be significant for other groups. This factor might provide an explanation for the apparently higher resilience of banking entities belonging to financial conglomerates and their lower funding costs in stressed periods, compared to other banking entities.

6 Conclusion

This study is aimed at shedding light on the effects of financial conglomerate membership on banks' profitability, risk-taking, default risk and funding costs. To that end, we estimate models of the entities' Return on Assets (ROA), the standard deviation of the ROA, the Z-score, a measure of banks' default risk, and the ratio of interest expenses to total liabilities, using quarterly supervisory data available at the ACPR on a consolidated basis for French banks. We find that the financial conglomerate membership reduces banks' funding costs, an effect that is even stronger in periods of financial stress or the Covid period. Moreover, financial conglomerate membership is found to reduce banks' default risk as it has a positive effect on a bank's Z-score overall. By contrast, no significant effect is shown on the ROA and the effect on the volatility of the ROA is found to be only weakly significant. By and large, these results invalidate the moral hazard assumption associated with financial conglomerates but rather highlight the benefits of diversification of risks within conglomerates.

Further extension of our analysis could consist in bringing an international perspective into the research question, in using a continuous variable capturing bancassurance activity and in comparing French "bancassurance" groups to other international banking groups. A network analysis could also shed light on the transmission of shocks through interconnections within each financial conglomerate.

Finally, the specificity of the activity of financial conglomerates requires a close cooperation between the supervisors of the different segments of the financial system (banking, insurance and financial markets), as currently carried out by integrated sectoral supervisors at the national level or by the Joint Committee of the European Supervisory Authorities. While the benefits for the banking entity of belonging to a financial conglomerate seem clear, the management of the insurance entity must respond to its own logic in order to protect the insurer's clients, and not to rescue the banking mother company in times of stress. Conversely, shareholders must be expected to rescue their subsidiary in case of a problem with the own funds of the latter. As requested by the IMF, a step further could be made by implementing regular stress tests of financial conglomerates at the highest level of consolidation in order to better identify and assess intragroup concentration risks. Finally, intragroup exposures could be subject to an increased supervisory scrutiny in order to check whether the use of large exposure limit waivers by financial groups within the European Union does not pose any financial stability risks.

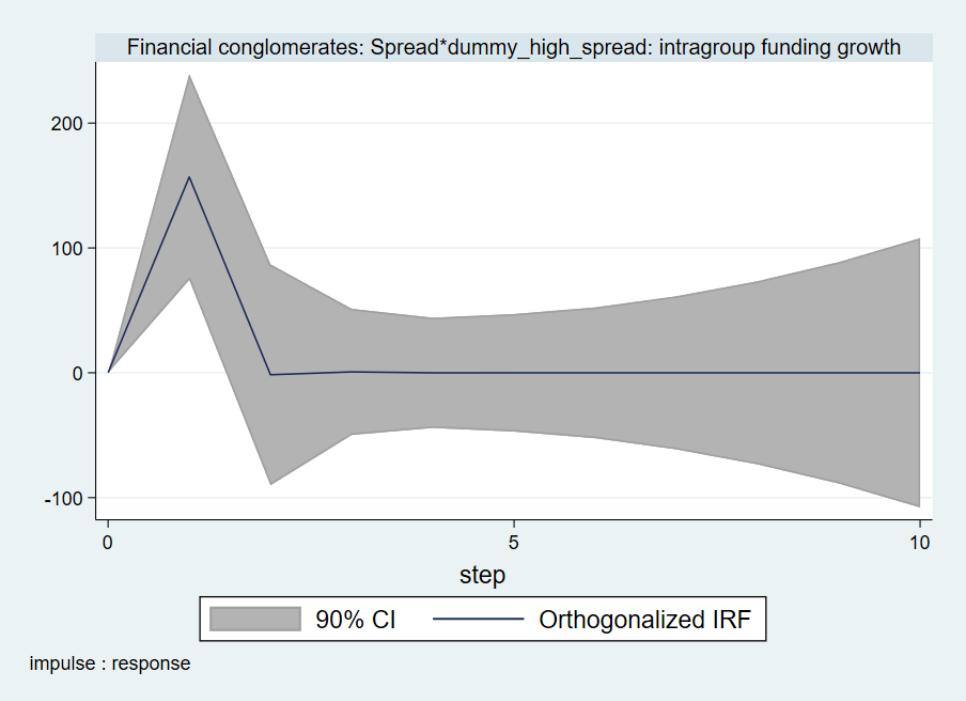

Figure 5: IRF from spread to intragroug funding growth for banking entities belonging to a financial conglomerate

Source: ACPR

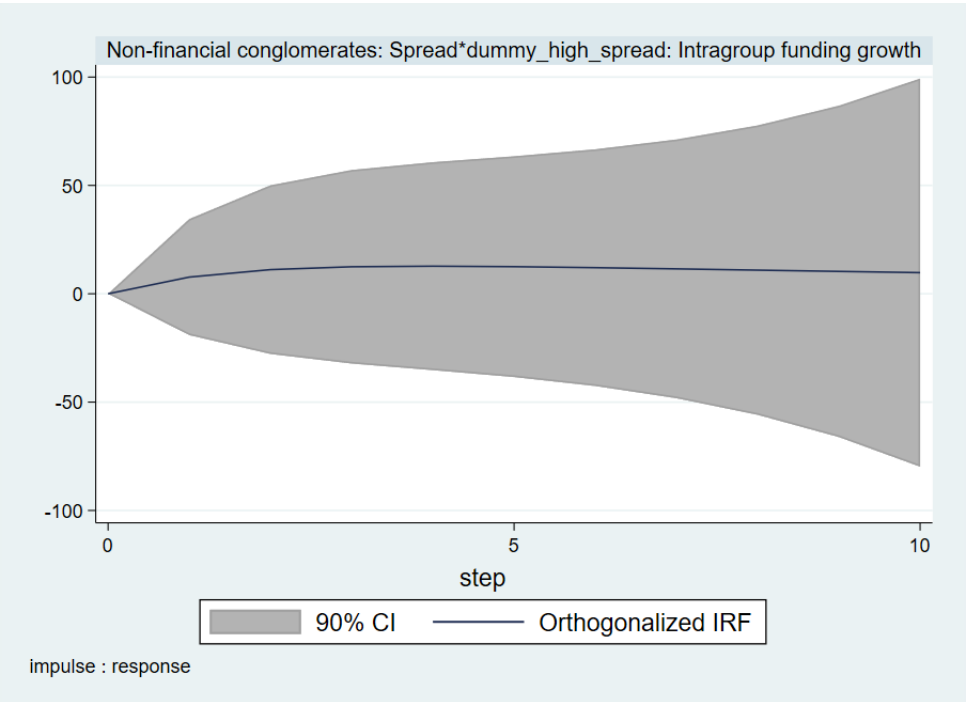

Figure 6: IRF from spread to intragroug funding growth for banking entities not belonging to a financial conglomerate

Source: ACPR

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