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Monetary Policy and Life Insurance Profitability: Bancassurance's Edge in a Low-Yield World

Pablo Aguilar-Perez

Highlights

- We show how the low-yield era of the 2010s shaped the behavior and profitability of non-bank financial intermediaries, identifying an income channel through which monetary policy transmits to life insurers.
- We demonstrate that monetary easing raises profitability, but its effect depends critically on the guaranteed yield spread: insurers relying on large margins between portfolio returns and guaranteed rates are significantly more exposed.
- We uncover strong business-model heterogeneity: bancassurers reprice liabilities faster, sustain higher premium growth, and benefit from more diversified portfolios, giving them a structural advantage in low-yield environments.

Abstract

This paper examines the effects of monetary policy on the profitability of life insurers during the prolonged low-interest-rate period, leveraging a novel dataset of 31 leading French insurers from 2009 to 2018. Following supervisory practice and business-model criteria, we classify firms into bancassurers (insurance subsidiaries of banking groups) and non-bancassurers (the rest of life insurers governed by the French Insurance Code). Our central contribution is to document the income channel for life insurance. Monetary policy easing boosts profitability, but the adverse effect of the low-yield era operates through the spread between portfolio returns and credited (guaranteed) rates: as this guaranteed-yield spread widens, the gain from easing attenuates. We show that this mechanism differs materially across business models. Bancassurers reduce credited rates more rapidly than peers while maintaining above-average premium growth, thereby dampening the income channel's drag and sustaining margins. Portfolio choices reinforce this advantage: bancassurers' profitability increases with higher equity shares, in contrast to non-bancassurers, consistent with more diversified portfolios that smooth returns. Taken together, the results reveal pronounced heterogeneity in how life insurers adapt to monetary easing and underscore the importance of business model for the transmission of monetary policy to non-bank financial intermediaries.

Keywords

Low-Interest Rate Environment, Insurance Profitability, Monetary Policy, Financial Stability, Non-Bank Financial Intermediaries.

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Monetary Policy and Life Insurance Profitability:

Bancassurance's Edge in a Low-Yield World

Pablo Aguilar Pérez*

1. Introduction

In response to the 2007 financial crisis, central banks from advanced economies implemented unconventional monetary policies, including significant reductions in monetary policy rates coupled with asset purchase programs (APP) targeted at "flattening" the yield curve, leading to a reduction in long-term interest rates by influencing market participants' expectations. This allowed governments to issue bonds with lower interest payments, increasing their fiscal flexibility and supporting the economic recovery (DeLong *et al.* 2012).

While there is widespread agreement that central banks' aggressive response at the early stages of the crisis was critical in preventing a financial and economic meltdown (Gray *et al.* 2008), concerns have mounted that the negative side effects of prolonged monetary accommodation may outweigh the net benefits after several years of implementation (Dale 2012; Rajan 2013). This is particularly true for banks and insurers, whose incentives and business models can be severely disrupted. Life insurance is more sensitive to monetary policy changes due to its long-term liabilities, which require matching with long-term assets. In contrast, non-life insurers, like property insurers, rely on short-term assets for short-term coverage, making them less vulnerable to interest rate fluctuations (Berdin *et al.* 2015).

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Profitable insurance companies are vital to a stable financial system, especially life insurers, who play a key role in channeling savings into the economy through fixed-income markets. Strong profitability and solvency are crucial for ensuring that savings are efficiently transformed into productive investments, supporting economic growth and stability. Profits act as a buffer for underwriting losses, help rebuild capital after significant losses, and attract external capital (Domanski *et al.* 2017).

Monetary policy affects life insurers through the mismatch between long-term liabilities and shorter-term assets. In a low-interest rate environment, investment returns fall, hurting profitability, while insurers must hold more capital to manage surrender risks and meet regulatory requirements, further eroding profits (Trichet 2005).

The decline in guaranteed rates of life insurance policies in France and Europe can be attributed to the low-interest rate environment. Guaranteed policies, which provide a minimum return, typically offer lower yields than insurers' investment returns, but low rates can reduce or reverse this spread, hurting profitability. Insurers are reluctant to lower their offered yields, fearing it may lead to policyholder surrenders, further exacerbating the issue. To mitigate the potential impact of the low-yield environment, regulators and insurers have implemented various measures, such as promoting the distribution of unit-linked (non-guaranteed) policies, committing to reducing guaranteed rates and diversifying their portfolios (Löfvendahl *et al.* 2017).

This paper examines the impact of the low-interest rate environment on French life insurers by analyzing the sources of heterogeneity in the transmission of monetary policy. The French insurance market serves as a representative case study, offering unique insights into the European market. Despite the strong fragmentation and diverse range of players across Europe, the French market stands out for its distinctive characteristics. As the second largest market in Europe after the UK, the French market is particularly interesting to examine the effects on profitability (Boissin *et al.* 2013). Its net investment spread—the difference between the yield of the 10-year government bond and the average yield served on guaranteed

policies—remains remarkably close to zero, unlike other European counterparts. This reduces the profitability buffer that other European insurers benefit from, similar to how a narrower spread between deposit and loan interest rates affects banks' margins. For French insurers, this limited spread restricts their ability to absorb interest rate changes without directly impacting profitability. By minimizing this spread, we can better isolate the direct impact of monetary policy. Furthermore, the share of guaranteed policies, which are the most vulnerable in a low-yield environment, is quite high in France, representing 70 percent of all premiums in 2015, compared to the EU weighted average of 51 percent (EIOPA 2020). These distinctive features make the French market a valuable reference point for understanding the impact of low interest rates on life insurers.

Our contribution to the literature is twofold. First, we comprehensively analyze the link between the low-yield environment and profitability, focusing on the life insurance sector. While this relationship has been extensively studied for the banking sector (Altavilla et al. 2018; Borio et al. 2017; Hack et al. 2021), research on the life insurance sector remains limited. We address this gap by drawing on a data set that covers 31 main life insurance companies headquartered in France for the period 2009-2018, using the overall return on assets (ROA) as a measure of profitability.

Second, we introduce a novel categorization framework for life insurers based on their distinct legal and business models. This framework includes *bancassurers*, which are financial conglomerates offering both banking and insurance services, traditional insurers that exclusively operate in the insurance sector as limited companies, and mutual insurance companies, which are non-profit entities without share capital (distinct from health mutuals, which are governed by the Mutuality Code). Notably, non-bancassurers represent close to 60 percent of total life insurance assets over the period. Despite its inherent appeal, this aspect has been largely overlooked in empirical research, with previous studies primarily focusing on categorization based on insurer size (Pouvelle *et al.* 2022).

We show that these new categories play an important role in evaluating the impact of monetary policy on the life insurance market. For instance, a small company offering life insurance products may benefit from its association with a larger banking conglomerate—gaining easier access to clients, enhanced liquidity within the group, and a broader range of policies and investments. Overlooking these factors can lead to an incomplete understanding of how the low-yield environment is reshaping the market.

This study employs panel data econometrics to investigate the impact of monetary policy on the profitability of French life insurers. The analysis reveals mixed evidence, which can be attributed to the heterogeneity within the sample. By introducing a novel categorization of life insurers, it becomes clear that monetary policy significantly influences *non-bancassurance* players, including limited insurance companies and mutual insurers.

Furthermore, the study reveals new insights into how insurers' characteristics, such as portfolio choices, premiums, and reserve adequacy, affect their profitability. The findings indicate marked differences among insurers, which are reshaping the life insurance market. In particular, *bancassurance* companies leverage the low-interest environment to lower guaranteed rates while expanding their market share. The results offer new perspectives on how monetary policy affects market power dynamics and highlight potential risks to financial stability due to the growing interconnectedness of financial conglomerates (Duval *et al.* 2021).

The remainder of the paper is structured as follows. Section 2 examines the primary channels through which a low-yield environment affects life insurers' profitability and presents the accompanying empirical evidence. Section 3 provides an overview of the French life insurance market, including stylized facts and an outlook. Section 4 outlines the empirical strategy and describes the data used, followed by a discussion of the econometric results in Section 5. The conclusion emphasizes the main findings and their implications.

2. The impact of a low-yield environment on life insurers' profitability

2.1. The channels at stake: insights from the literature

The 2007 financial crisis prompted central banks to significantly lower interest rates for an extended period, aiming to stimulate the economy and raise inflation expectations. However, the resulting low-yield environment did not favor all sectors equally, with the financial sector being particularly affected. The business models of both banks and insurance companies are highly sensitive to interest rate changes, as their assets and liabilities are directly influenced by monetary policy (Berends *et al.* 2013).

Banks, for instance, rely on the interest rate spread between their liabilities (deposits) and assets (loans). As the adjustment speed is lower for deposits than for loans, a decrease in interest rates compresses banks' net interest margins (Wang 2018). The negative effects of a protracted period of low interest rates become more pronounced over time (Altavilla *et al.* 2018). Similarly, Borio *et al.* (2017) highlight that the low rate environment's negative impact on bank profitability outweighs the positive effects of increased provisions and valuation gains.

Despite the similarities in the impact of the low-yield environment on banks and insurers, there are several key differences between these financial intermediaries. Banks have access to central bank liquidity, while insurers do not. Additionally, banks manage long-term assets with short-term liabilities, whereas insurers handle short-term assets with long-term liabilities. Finally, banks primarily focus on lending activities, while insurers invest mainly in bonds and other capital markets assets (Argimon *et al.* 2019).

The "income channel" is the primary mechanism through which the low-yield environment affects the profitability of life insurers. Life insurers' assets typically have shorter maturities than their liabilities, resulting in a duration mismatch. As a consequence, when maturing assets are reinvested at lower yields, life insurers' investment income progressively decreases (Bindseil, 2018; Claeys *et al.* 2015). Across European life insurance companies, the average liability is 4.21 years longer than the average asset, with French life insurance companies slightly above the average, exhibiting a duration mismatch of 4.82 years (EIOPA 2014).

Reinvestment risk poses a significant challenge for life insurers, as newer investments often have lower yields. To maintain profitability, companies are forced to adjust the returns they offer, which can make policies less attractive to policyholders. This, in turn, creates a risk of policy surrenders, as policyholders may seek higher returns elsewhere.

A company's business model determines its level of vulnerability to the income channel. Insurers that have sold policies with built-in guarantees promising a minimum return throughout the duration of the policies are more severely impacted, as these guarantees reduce their profit margins. Consequently, insurers with a smaller proportion of unit-linked contracts and those with higher guaranteed rates and longer contract maturities are the most vulnerable to the effects of the low-yield environment (EIOPA 2020, 2019). This vulnerability is evident in the case of European insurers with a higher share of liabilities with minimum return guarantees in 2016, which experienced lower stock returns during the COVID-19 crisis (Koijen *et al.* 2022).

Due to the lack of firm-level data, studies have often relied on the stock returns of life insurance companies to measure the impact of monetary policy on profitability (Hartley *et al.* 2016). This “top-down" approach assumes that lower profits are reflected in lower stock prices, as stock analysts and rating agencies consider the interest rate sensitivity of an insurer's liabilities. However, this method has limitations. First, it only includes publicly traded companies, introducing a selection bias. Second, stock returns do not fully capture a company's financial performance, as they are also influenced by the overall performance of the national stock market where the company is listed. This introduces a large home bias, even though large life insurance companies may operate in multiple markets. The case of France illustrates these shortcomings especially clearly: listed limited liability companies such as Allianz or Generali tend to have substantial activities abroad, bancassurance groups are not listed separately so that their stock prices primarily reflect the banking arm of the conglomerate, and mutual insurers, which account for a significant share of the domestic market, are not listed at all. As a result, the stock-return approach proves especially ill-suited, and in practice largely inapplicable, for the French life insurance market.

Furthermore, Domanski et *al.* 2017 suggest that life insurers pursued a “hunt for duration" strategy in response to the low-yield environment. This strategy involved increasing their acquisition of bonds with longer maturities, mainly sovereign bonds. The increased demand for these bonds led to excess demand and subsequently lowered their yields, creating a vicious cycle that perpetuated the low-yield environment.

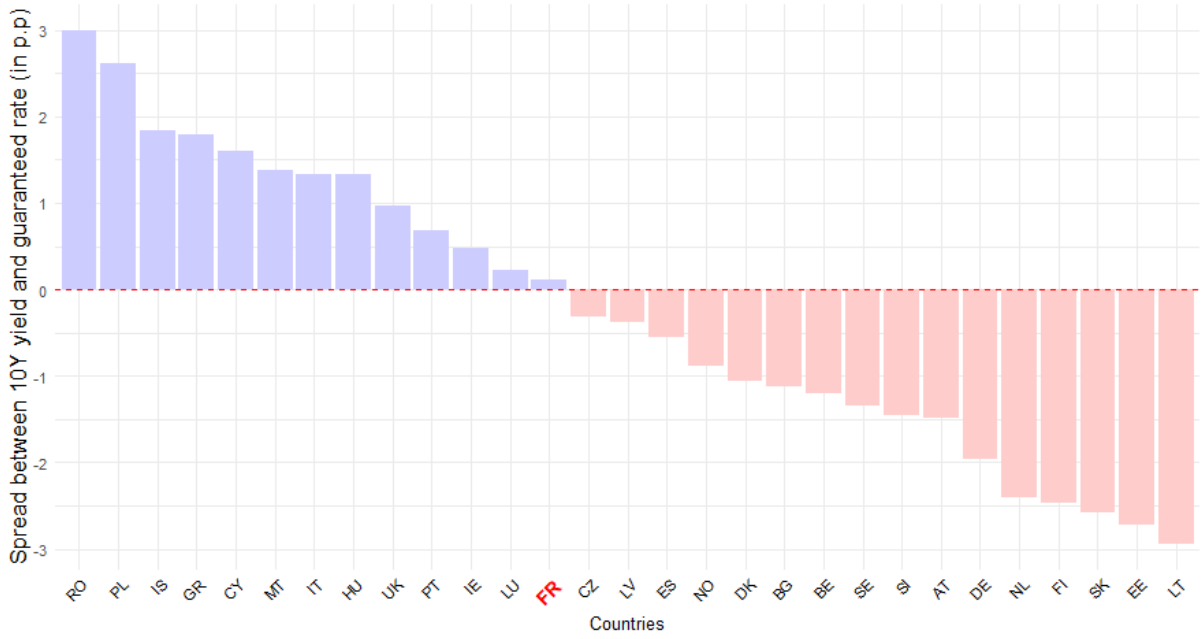
One measure for evaluating the impact of the low interest rate environment is the net investment spread, which is the difference between the 10-year sovereign bond yield and the national average guaranteed rate, as highlighted by Löfvendahl and Yong (2017).[1] Many life insurers in certain jurisdictions have struggled to meet the investment guarantees they promised policyholders. To ensure they can meet these guarantees, insurers can invest in government bonds with a duration similar to the underlying insurance contract.[2]

By adopting this investment approach, insurers can assess their ability to honor investment guarantees by comparing the yields they can earn from the reference government bond (10-year sovereign bond) with the guaranteed yield offered to policyholders. Figure 1 shows that in the 2017-2018 period, 15 out of 29 European countries reported a negative net investment spread, with France slightly above zero percent.

The income channel and its effects on insurers’ profitability in the low-yield environment have been investigated in the literature. Berdin *et al.* (2015) demonstrate that lower long-term rates reduce insurance profitability across EU life insurance companies, while non-life insurance companies remain unaffected. Although this study is the only industry-wide empirical analysis across EU member states, cross-country comparisons remain challenging due to variations in business operations and significant differences in guaranteed levels.

[1] The guaranteed rate offered by life insurance companies is the minimum yield that the insurer commits to pay on the policyholder's investment or savings component, regardless of market conditions.
[2] For France, the average duration of life insurance policies is 12 years, but it ranges from 5 to 15 years for the rest of the European countries.

Fig. 1 Net investment spread per EU country



Note: Data from 29 European countries (EIOPA oversight). Each country's spread averaged for 2017-2018. Data from EIOPA and ECB Statistical Data Warehouse.

The literature also emphasizes the "balance-sheet channel" which examines how interest rates affect insurers' solvency through valuation effects, potentially impacting profitability. Lower interest rates typically increase the values of both assets and liabilities. However, under Solvency II, liabilities tend to increase more than assets, particularly as fixed-term investments make up only a fraction of total liabilities. This dynamic increases capital ratios under Solvency II, but life insurers face challenges, as unrealized bond gains rise without a matching yield increase (Berdin *et al.* 2015).

Regulators have raised ongoing concerns about life insurers potentially engaging in "hunt for yield" behavior—allocating assets to riskier investments with lower credit ratings, reduced liquidity, or higher yields—in response to low interest rate environments (EIOPA 2020; Boubaker et al. 2018). Persistently low interest rates can amplify risk-taking behavior across financial institutions, as accommodative policies encourage greater exposure to riskier assets in search of yield, implying a trade-off between stabilization and systemic risk (Grimm et al., 2023; Adrian 2020; Kaufmann et. al. 2024). To mitigate this risk, regulatory frameworks like

Solvency II have implemented risk-based capital requirements that are calibrated to increase disproportionately with asset risk. For example, equities or real estate are subject to substantially higher capital charges than investment-grade corporate or government bonds, while diversification across asset classes reduces the overall capital requirement through explicit correlation matrices. This design both discourages excessive exposure to high-yielding but volatile assets and encourages portfolio diversification, thereby reducing insolvency risk and enhancing market stability (Bijapur et al. 2007).

These regulations significantly influence insurers' investment decisions by (1) determining profit distribution to policyholders, and (2) establishing risk weightings for various asset categories. As a result, insurers may be incentivized to invest in lower-yield assets with favorable risk weightings, which frees up more reserve capital. Conversely, investments in higher-yielding corporate bonds or stocks are heavily penalized under solvency regulations. Nevertheless, evidence suggests that in a low-rate environment, investors—including institutional ones such as insurers—tend to shift toward high-dividend-paying corporates and other income-generating assets to maintain nominal income levels (Daniel *et al.* 2021).

A third indirect channel, known as the “economic activity channel,” emerges from the broader economic effects of lower interest rates. Central banks typically lower rates to stimulate economic activity by encouraging borrowing and spending. This economic stimulus can indirectly benefit life insurers through a knock-on effect. As economic conditions improve, households generally experience higher disposable income and savings. This increase in savings often translates into greater demand for life insurance products. Consequently, life insurers may see an uptick in new premiums, potentially offsetting the low returns on their investment portfolios (Berends *et al.* 2013). Chebbi (2018) also notes that lower rates and unconventional monetary policy can enhance financial asset performance, prompting policyholders to shift toward unit-linked policies. This shift is supported by regulations offering incentives and flexibility for transitioning to non-guaranteed policies.

2.2. Evidence on firm size as a determinant of profitability

Having examined the primary channels through which monetary policy influences insurers' profitability, it is important to consider additional factors that modulate this impact on financial intermediaries, notably company size. Size has long been recognized as a significant determinant of profitability across various sectors, primarily due to the ability of larger entities to diversify and balance asymmetric shocks (Ehrmann 2005; Thürwächter 2022). In the financial sector, where companies are highly sensitive to interest rate changes, the effects of monetary policy can vary significantly depending on a firm's size.

To date, existing research has predominantly focused on the banking sector, revealing that institutional size can predict access to capital markets, diversification strategies, and risk-taking behaviors. These factors, in turn, either amplify or mitigate the effects of interest rate changes (Saona 2011; Pham *et al.* 2021; Hack *et al.* 2021). Further evidence indicates that bank size influences monetary policy sensitivity. Larger banks appear more affected by interest rate changes during periods of loose monetary policy, while smaller banks exhibit greater sensitivity under tight monetary policy regimes (Naqvi *et al.* 2023). Meanwhile, research in the insurance sector has produced mixed results, with studies on the EU market suggesting a complex relationship between company size and sensitivity to interest rate changes. Berdin *et al.* (2015) find that large life insurance companies' profitability remains largely unaffected by interest rate fluctuations. In contrast, smaller companies appear more vulnerable in a low-yield environment, primarily due to their less diversified portfolios and limited geographical scope. This vulnerability of smaller insurers can be attributed to their limited resources and reduced flexibility in managing interest rate fluctuations, which increases their susceptibility to financial stress.

However, the picture is not straightforward. Berends *et al.* (2013) present a contrasting view, noting that large life insurance firms face their own set of challenges. These larger entities often have more interest-rate-sensitive liabilities, a greater proportion of non-insurance assets, and face increased pressure from the stock market. These factors can potentially amplify the negative effects of a low-interest environment on larger insurers.

The analysis of monetary policy's impact on life insurance profitability is complicated by the growing interconnectedness between bank and non-bank intermediaries and the rise of financial conglomerates. Size alone doesn't capture all factors; business models and legal structures may offer better insights. Decades of financial sector consolidations have led researchers and regulators to study the risks of conglomerates. (Yoo 2010). Van Lelyveld *et al.* (2009) find that firms engaging in multiple activities are valued lower, while Amel *et al.* (2004) or Montgomery *et al.* (2014) show diminishing returns to scale for large intermediaries, offset by market power gains.

The French market serves as an excellent case study due to the strong growth of financial conglomerates in its life insurance sector, known as "bancassurers"—banks operating in the life insurance industry—, and a significant share of guaranteed products. This environment underscores the need to consider factors beyond size to effectively understand the transmission of monetary policy on life insurers.

3. Segmentation-based transmission mechanisms

3.1. The French case study

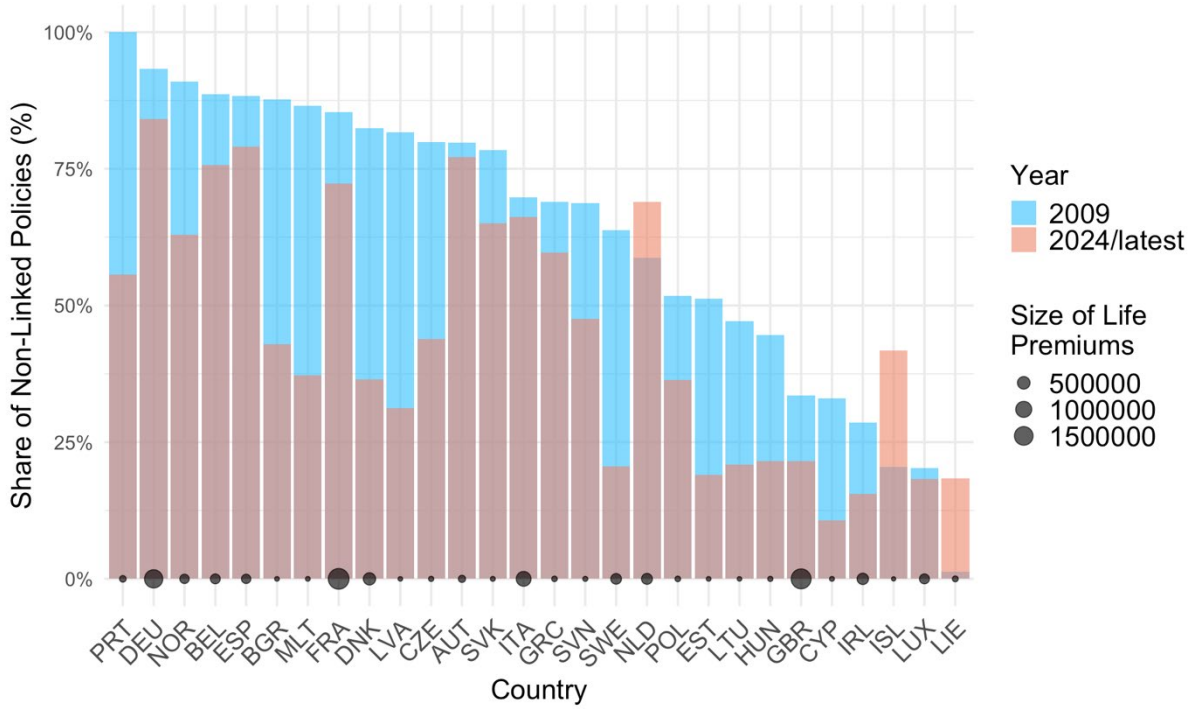
France boasts one of the world's most developed insurance markets, ranking fifth globally and second in Europe in terms of gross written premiums (GWP). In 2018, the outstanding value of life insurance policies amounted to 70% of French GDP (1.7 trillion EUR), while the entire insurance sector's assets represented 118% of GDP—still far smaller than the banking sector at 344%. Life insurance has grown as a preferred savings vehicle, with household participation rising from 35% in 2010 to 39.2% in 2018 (Fraysse *et al.*, 2020).[3]

The life insurance industry plays a key role in channeling household savings into investments. Despite a relative decline in the number of life insurance providers since 2014, from 93 to 83, the 20 largest firms now represent 89% of the market, up from 85% in 2011.

[3] Since banking sector assets are reported on a consolidated basis, they may include a share of insurance activities, particularly for bancassurance groups. To provide a more conservative comparison, the ACPR report "*Les chiffres du marché français de la banque et de l'assurance* (2018)" indicates that bank deposits amounted to about 170% of the GDP in 2018, while insurance provisions represented around 91% of GDP.

Euro-guaranteed contracts have emerged as a cornerstone of French household financial wealth, making up 40% of total holdings in 2015 (Perdu *et al.* 2019). These contracts appeal to risk-averse savers with guaranteed capital and returns. Life insurance's popularity is further driven by tax incentives, offering relief on gains after four years and even larger breaks after eight years.

Fig. 2 Share of guaranteed policies over total policies in the EU from 2005 to 2015



Note: Data from 28 European countries (EIOPA oversight). Share = Gross life assurance provision / (Gross life assurance provision + Gross technical provisions for life assurance policies where the investment risk is borne by the policyholders (unit-linked)) *100. Sources: EIOPA Insurance Statistics. For the United Kingdom (GBR) the latest available data is from 2016.

Figure 2 shows a decline in guaranteed policies across Europe, as consumers shift towards unit-linked policies. From 2009 to 2024, 25 out of 28 European countries saw a drop in guaranteed policies. In France, where these policies remain dominant, the decrease was smaller, from 85% to 73%. This reflects life insurers' efforts to steer consumers towards unit-linked options in response to market changes. At the European level, the weighted average share of unit-linked provisions rose from around 25% in 2005 to nearly 37.5% in 2024, with the sharpest increase occurring between 2020 and 2024.

In France, life insurers are mandated by the Insurance Code to distribute 85% of financial surpluses and 90% of technical surpluses to policyholders, with the rest held for deferred profit-sharing within eight years, smoothing returns during tough financial periods. The ten-year sample covered in the article, spanning from 2009 to 2018, captures the full cycle of profit-sharing dynamics, as the average length of these contracts ranges from 8 to 12 years. This overview shows how life insurance in France serves not only as a major savings and investment avenue for individuals but also as a significant source of funding for both businesses and governments.[4]

3.2. The role of business model segmentation

Over the last few decades, *bancassurance* has consolidated its position as a relevant distribution channel in the European insurance industry, though its importance differs widely across countries. *Bancassurance* refers to the distribution of insurance products through banks, integrating banking and insurance services. According to Insurance Europe, the share of life insurance distributed via bancassurance rose from 26% in 2004 to 31% in 2019.[5] This consolidation has reshaped the insurance landscape, raising questions about profitability, resilience, and systemic risks (Benoist 2002). Bancassurers leverage their extensive customer base by bundling insurance with banking services such as loans and mortgages, capturing significant market share across Europe.

The *bancassurance* model originated in France during the 1980s as a strategic response to the growing life insurance market, generating synergies for the distribution of life insurance products (Pouvelle *et al.* 2022). As the model grew in Europe, regulatory oversight became necessary. The EU introduced the Financial Conglomerates (FICO) directive in 2002, setting rules for bancassurance players. To qualify for FICO status, a group must meet three

[4] According to the French insurance federation (*France Assureurs, Les placements de l'assurance en 2023*), total insurance sector investments amounted to 2.54 Bn EUR at the end of 2023 of which 63.3 percent were directed towards businesses (through corporate bonds (34.1%), equities (23.9%), and real estate (5.3%)) while sovereign bonds represented 24.1% of total assets. This allocation illustrates the dual role of life insurers as a major source of long-term financing for both the private sector and governments.

[5] In Southern Europe, bancassurance accounts for more than half of life insurance distribution in countries such as Malta, Portugal, Italy, and Spain. In France, which is central to our analysis, the bancassurance share stood between 60% and 65% over the period 2009–2018.

conditions: (i) a "regulated entity" as the head of the group, (ii) at least one insurance and one banking entity within the group, and (iii) significant activities in both sectors, with financial assets exceeding 40% of the group's balance sheet (Meyers *et al.* 2003).

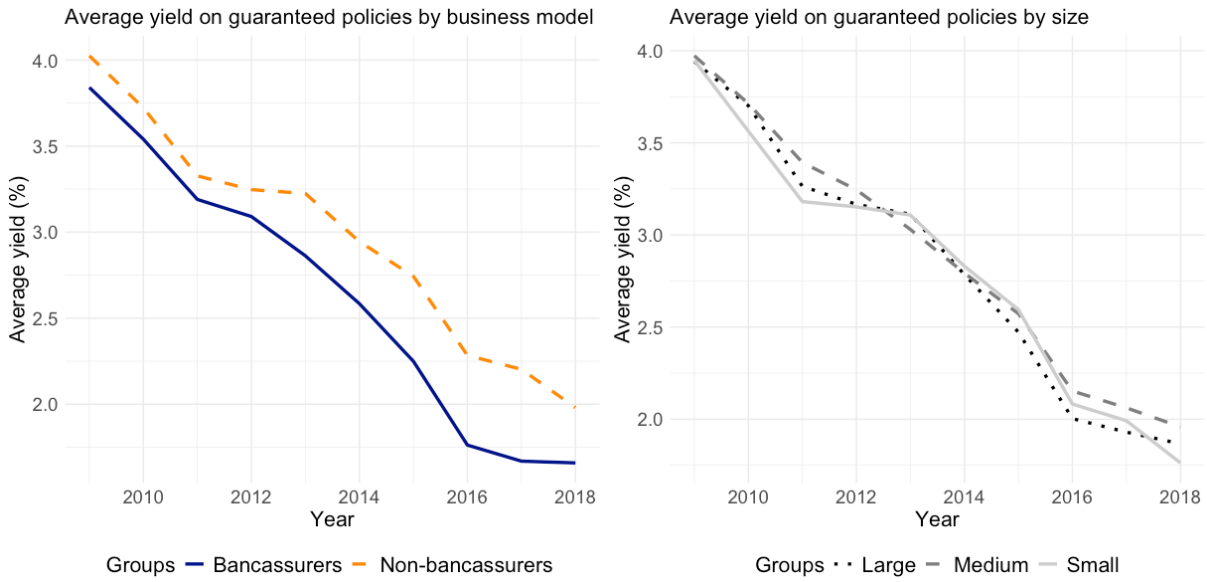
The FICO categorization, which recognizes the unique position of bancassurance players in the French life insurance market, is crucial for the next step of our empirical analysis. This analysis distinguishes bancassurance from non-bancassurance players, considering the distinct features and market dynamics associated with each category.

We follow the supervisory convention used by the ACPR and distinguish bancassurers from other life insurers. In France, bancassurers owned by banking groups—such as BNP Paribas Cardif and Crédit Agricole Assurances—dominate the market, accounting for about 65% of premiums in 2018. Despite their scale, their average net revaluation rate on euro-denominated policies was 1.93% in 2018, below the market average of 2.43%, a gap that has widened since 2011 (Capitaine *et al.* 2019). Their competitive edge derives from integrated bank distribution, product bundling to existing bank clients, and access to intra-group financing within financial conglomerates.

The residual category, which we term non-bancassurers, groups insurers that the ACPR likewise treats collectively as "other life insurance companies." It includes (i) listed S.A. insurance groups (e.g., AXA, Allianz, Abeille/Aviva, Generali) and (ii) mutual insurers (e.g., La Mondiale, AGPM, CARAC). All are governed by the Insurance Code and have insurance as their core activity. Although mutuals differ in governance (e.g., member/worker representation on boards) and many S.A.s are larger and often publicly traded, these subtypes display similar credited-rate and premium-growth dynamics relative to bancassurers and, in practice, tend to offer higher credited yields on guaranteed policies. Consistent with the regulator's "bancassurance vs. other" lens and with the empirical similarity of these non-bank-affiliated models, we pool S.A.s and mutuals into a single non-bancassurer category in what follows.

An analysis of the data shows that classifying insurers based solely on size overlooks key differences between them, leading to incomplete categorizations. We propose a classification based on the scope of supervision and business model to better reflect each type's unique traits, as shown in Figure 3.

Fig. 3 Guaranteed yield heterogeneity: Legal vs. Size classifications



Note: Individual insurers' financial statements and AM Best data.

The figure shows a broad decline in guaranteed rates for both bancassurers and non-bancassurers, consistent with the prolonged low-yield environment. At the start of the sample, credited rates were comparable across the two groups. Over time, however, bancassurers reduced rates more quickly while preserving market share, whereas non-bancassurers adjusted more gradually and ended the period with higher credited rates. This divergence points to systematic differences in liability repricing between the two business models. On the contrary, the right figure shows a similar trend across insurers regardless of size.

Classifying insurers by business model can improve analysis and regulatory oversight by accounting for the unique challenges and opportunities each type faces. This approach goes beyond asset size, offering a deeper understanding of industry dynamics and enabling more targeted decision-making.

4. Stylized facts and data

This section presents stylized facts about the French life insurance market and details the dataset, which includes insurance-level data from AMBest, covering balance sheets, annual reports, and Solvency and Financial Condition Reports (SFCR) for major life insurers in France. The sample spans 2009 to 2018, a decade marked by persistently falling interest rates and the European Central Bank's unconventional monetary policy measures following the Great Financial Crisis.

The final dataset comprises yearly information on 31 French life insurers, resulting in a total of 300 observations. These insurers collectively account for life written premiums totaling 144 billion EUR, which represents nearly 90 percent of total life gross written premiums in France. Each insurer in the sample has data for at least 8 years. The business model categories for the life insurance companies in the sample include 12 bancassurers, and 19 non-bancassurers (**Table 5** in Appendix).

Table 1 Summary statistics

Statistic	N	Mean	St. Dev.	25th Pctl	75th Pctl	Within SE
Variables of interest						
Return on assets	300	3.72	3.74	1.80	4.70	0.17
Return on investments	302	3.55	1.72	2.90	4.34	0.10
Return on equity	300	7.64	6.95	4.80	10.11	0.34
Monetary policy variables						
Monetary policy shock FR10Y (Altavilla, 2019)	310	−1.64	4.28	−5.88	1.05	0.24
EU shadow rate	302	−1.80	2.25	−4.03	0.05	0.13
Individual features						
Yield on guaranteed funds	310	2.82	0.77	2.17	3.40	0.04
Guaranteed yield spread	302	0.71	1.56	0.18	1.44	0.09
Share of bonds	302	79.69	12.64	72.91	88.06	0.30
Share of equities	302	15.34	11.18	7.98	19.35	0.25
Share of unit-linked investments	301	16.73	16.63	5.00	22.49	0.16
Net reserves ratio	291	11.48	4.33	8.77	13.52	0.17
Yearly growth in premiums	266	2.35	15.07	−5.94	10.72	0.85
Total assets	305	59,460.53	80,495.28	6,452.00	85,178.00	883.88

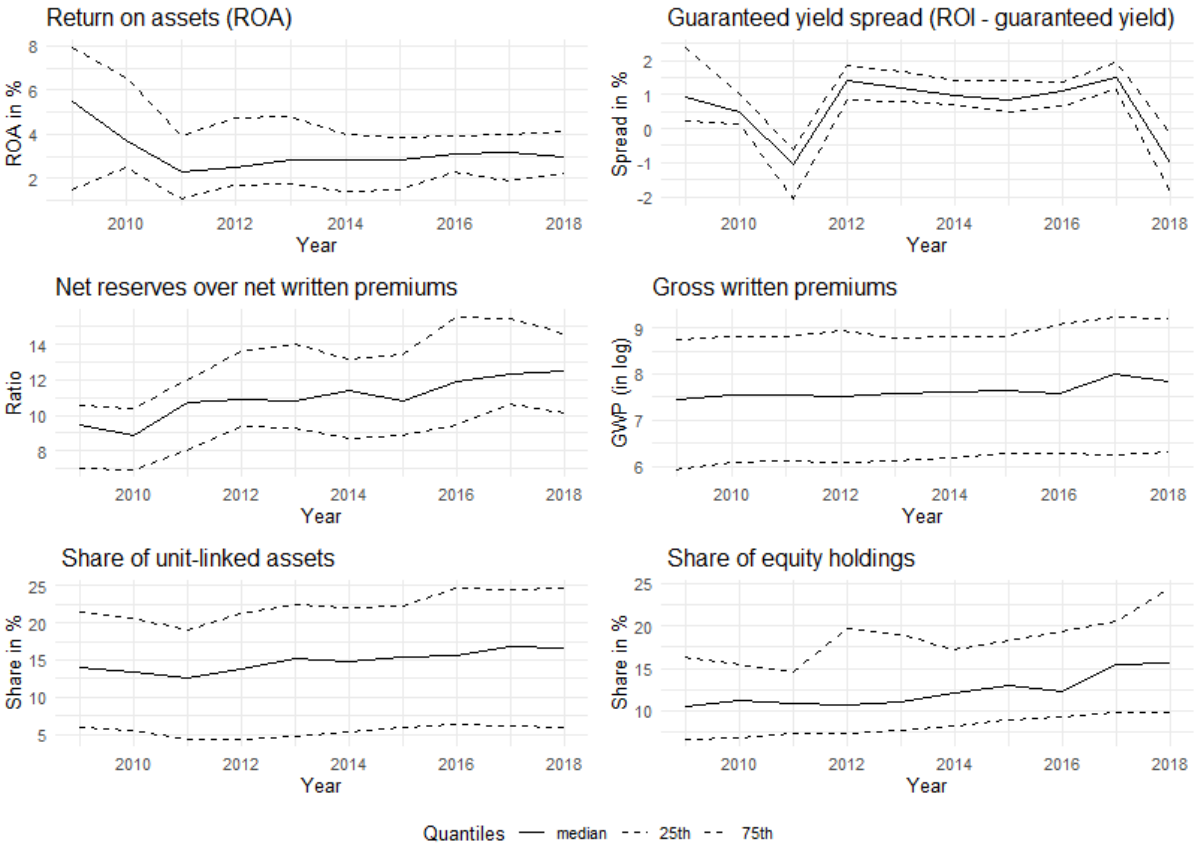
Note: N: number of observations; Return on assets (ROA), Return on investments (ROI), Return on equity (ROE), Solvency I ratio, Monetary policy shock FR10Y from Altavillas' EA-MPD database, EU shadow rate (Wu and Xia, 2016), Yield on guaranteed funds (individual insurer's yearly average yield on guaranteed policies), Guaranteed yield spread : ROI - Yield on guaranteed funds, Share of bonds, equities, unit-linked investments: % of investment portfolio; Net reserves ratio (net reserves/net written premiums); Yearly growth in premiums (% change in written premiums).

Table 1 presents the descriptive statistics of the variables used in this study, revealing significant disparities among life insurers' individual characteristics. For instance, the inter-

quartile range (25th to 75th percentile) for bond holdings as a percentage of the non-linked investment portfolio spans from 73 to 88 percent. This finding is consistent with existing literature, which typically identifies bonds as the predominant asset in life insurers' portfolios. The data also demonstrate considerable variability in portfolio composition. Equity holdings in the portfolios range from 8% to nearly 20% (inter-quartile), while unit-linked policies constitute between 5% and 22.5% of total assets. These summary statistics highlight how life insurers use varied asset allocation strategies to balance risk and return.

Figure 4 illustrates the main trends among the industry's variables. Return on Assets (ROA), an indicator of profitability, declines steadily from 2009 to 2018. A pronounced drop occurs between 2009 and 2011, after which the values level off, though the dashed lines reveal considerable variation across percentiles. While the net investment spread—defined as the difference between long-term sovereign bond yields and the average guaranteed rate—serves as a useful macroeconomic-level proxy for assessing the pressures created by a low-interest rate environment, a more precise measure at the firm level is the guaranteed yield spread. This spread captures the difference between an individual insurer's actual return on investment and the average yield credited on guaranteed policies. The latter is calculated across all existing contracts, including those that are closed to new subscriptions, and reflects the gross yield before fees and taxes. In the French context, it is important to note that the guaranteed rate offered at the time of subscription applies only for the first policy year; thereafter, the rate credited is determined annually by the insurer based on portfolio performance and profit-sharing mechanisms. The Guaranteed Yield Spread—calculated as the difference between the Return on Investments (ROI) and the individual insurer's yearly average yield on guaranteed policies —fluctuates, with a marked decline in 2012, a subsequent recovery, and another drop between 2017 and 2018. Overall, the spread shows a decrease trend, possibly reflecting the varied influence of monetary policy via the income channel.

Fig. 4 Variables of interest



Note: Individual insurers' financial statements and AM Best data.

The figure also depicts the portfolio mix variables, revealing two significant trends. First, the steady share of unit-linked assets over the sample period suggests a consistent allocation of funds to these investment vehicles. However, the heterogeneity implies that different insurance companies may have varying levels of exposure to unit-linked assets, depending on their portfolio strategy. Second, the increasing trend in equity holdings indicates a rising preference for equity investments by insurance companies. This trend may be driven by the search for higher returns in a low-interest-rate environment or the desire to diversify investment portfolios.

4.1. Econometric framework

The baseline empirical model is estimated with the following regression:

$$Y_{it} = \alpha + \beta_1 \text{MP}_t + \beta_2 \text{GYS}_{it} + \beta_3 X_{it-1} + \beta_4 Z_{t-1} + \omega_i + \epsilon_{it} \quad (1)$$

where the i and t subscripts denote the spatial and temporal parameters of the panel, respectively and ϵ_{it} is the residual term. The dependent variable Y_{it} measures the profitability of entities using the *return on assets* (ROA), calculated as the ratio of net profit to average assets over three years, is widely used by prudential authorities and in literature to monitor insurer and bank profitability (Altavilla et al. 2018; Borio et al. 2017; Berdin et al. 2015; Kwon et al. 2017). MP_t denotes the unexpected component of monetary policy by using the (Altavilla et al. 2019) EA-MPD database. Specifically, we focus on the unexpected change in the 10-year French bond rate during the press release window.[6] For robustness, we also consider the ECB shadow rate as an alternative indicator for euro area unconventional monetary policy, estimated from a shadow-rate term structure model that maps the yield curve into an equivalent latent short rate unconstrained by the zero lower bound (Wu and Xia 2016).

The *average yield on guaranteed policies*, used to compute the *guaranteed yield spread* GYS_{it} , is derived from web-scraping the yield of 156 guaranteed policies for the 31 life insurance companies in the sample over the period from 2005 to 2018, resulting in a total of 1612 observations with an average of 5 policies per insurer across the period. Consequently, GYS_{it} , represents the average gap between the actual return of insurance companies on their investments, which includes unrealized gains and losses, and the yield allocated to policyholders. This measure can also help capture the effect of the income channel, as it reflects how insurers manage the difference between investment returns and payouts to policyholders in a low-yield environment, influencing their profitability and income generation.

The model accounts for life insurance characteristics by including a set of individual fixed effects ω_i, and a vector of time-varying, insurance-specific indicators X_{it-1}. These indicators are crucial for identifying factors that influence the profitability of life insurers (Kozak et al. 2011). The vector X_{it-1} comprises four key components:

[6] This approach calculates the change from the median quote in the 13:25–13:35 interval before the press release to the median quote in the 14:00–14:10 interval following the announcement, summing these effects over the year to capture the cumulative impact.

- Premium level: This is measured as the natural logarithm of total gross written premiums in millions of euros (Malik 2011).
- Share of equities: Calculated as the share of equity investments relative to guaranteed policy investments, measuring the “hunt for yield.” It has shown an increasing trend as life insurers diversify their portfolios. A higher share implies higher-risk and more profitable investments, so a positive coefficient is expected.
- Share of unit-linked assets: This is defined as unit-linked assets as a share of total assets. Since policyholders bear the risk, these products yield higher fees, leading to expected profitability gains.
- Net reserves over net written premiums ratio (NRNWP): A proxy for solvency requirements and risk aversion, reflecting the mathematical provisions kept by insurers to cover net written premiums. A negative coefficient is expected, as a higher ratio may weight on profitability.

Furthermore, the model controls for macroeconomic conditions with vector of time-varying, indicators Z_{t-1}, comprising the lagged annual CAC 40 stock index returns and the lagged real GDP growth for France. These variables proxy asset-price and business-cycle movements most relevant for insurers, while the lag structure mitigates reverse causality and improves interpretation. This parsimonious set curbs omitted-variable bias and limits collinearity with the monetary-policy shock.

4.2. Testable hypotheses

The empirical analysis of the low-yield environment’s impact on French life insurers explores several testable hypotheses based on (Löfvendahl and Yong 2017), exploring potential measures insurers and regulators might adopt in response to low interest rates. Regulators’ feedback suggests imposing higher capital requirements and technical provisions on life insurers, while insurers typically employ three strategies to navigate the low-yield environment: lowering guaranteed interest rates, diversifying investments, and encouraging

policyholders to switch from guaranteed to unit-linked policies. This framework provides a basis for testing the impact of these strategies on profitability:

- The guaranteed yield spread is hypothesized to have a positive effect on the return on assets, as higher spreads indicate greater margins between investment returns and guaranteed policyholder rates, thereby enhancing profitability.
- Increasing asset diversification by raising the portfolio share of equities is anticipated to have a positive effect on the return on assets. Diversifying investments may help improve overall returns.
- A negative relationship is expected between the increase in the net reserves ratio, which serves as a proxy measure of capital requirements, and the return on assets. Higher capital requirements may constrain insurers' ability to generate profits.
- The share of unit-linked assets is hypothesized to have a positive relationship with profitability. The risk transfer to policyholders eliminates the obligation for insurers to provide guaranteed yields on these policies, allowing them to benefit from reduced risk exposure.

Testing these hypotheses will shed light on the effectiveness of insurer strategies and regulatory actions in the low-yield environment.

5. Estimation results

5.1. Econometric considerations

To address common econometric issues like multicollinearity, heteroskedasticity, and autocorrelation, robust standard errors are used (MacKinnon and White 1985). Given the short time dimension (T = 10), unit root concerns are disregarded. Collinearity is also taken into account throughout the analysis. The Hausman test (Hausman 1978) and Breusch-Pagan Lagrangian Multiplier test (Breusch and Pagan 1980) support the use of a fixed effects model for analyzing life insurer profitability. Endogeneity is addressed by calculating Pearson correlation coefficients (all below 0.3) and checking Variance Inflation Factor (VIF) values,

none exceeding 1.3. Although S-GMM is common in banking studies, it may produce biased results in small samples, and the endogeneity issue may be minor given the sample characteristics. Although aggregate life insurance industry conditions could influence monetary policy decisions by affecting long-term yields through portfolio switches to sovereign bonds, focusing on a benchmark market, such as the French life insurance market, diminishes the likelihood of observing a significant impact on monetary policy decisions.

5.2. Benchmark results

The results presented in Table 2 for the baseline specification (1) show that the FR10Y monetary policy shock has little average effect on ROA—small and statistically insignificant. Interacting the variable in specification (2) with the guaranteed-yield spread (GYS) clarifies the picture: a monetary easing (negative FR10Y shock) raises ROA when GYS is tight. Quantitatively, a 1 bp surprise easing in the French 10-year yield around announcement windows increases ROA by about 0.08 percentage points when the GYS equals zero. The gain diminishes as GYS widens, indicating that some insurers' profitability is more reliant on maintaining a large margin between the portfolio return and the guaranteed rate. In the low-yield period—when this margin compressed—our estimates could imply that the easing effect is strongest for firms able to operate with tighter spreads, while those dependent on wide spreads see little incremental benefit. The marginal-effect plot in **Fig. 6** in Appendix illustrates this gradient.

Table 2 Benchmark regressions results - Return on Assets

	Return on Assets (ROA)	
	(1)	(2)
Monetary Policy Shock FR10Y (MPSFR10Y)	−0.02	−0.08**
	(0.03)	(0.04)
Guaranteed yield spread (GYS)	0.14*	0.21**
	(0.08)	(0.10)
MPSFR10Y × GYS		0.05**
		(0.02)
L1. Log gross written premiums	−2.51***	−2.56***
	(0.54)	(0.57)
L1. Share of equities	−0.10*	−0.11*
	(0.06)	(0.06)
L1. Net reserves ratio	−0.03	−0.03
	(0.05)	(0.05)
L1. Share of unit-linked policies	0.09	0.06
	(0.05)	(0.05)
L1. CAC 40	−0.00	−0.00
	(0.01)	(0.01)
L1. Real GDP YoY	−0.24*	−0.26*
	(0.14)	(0.14)
FE	YES	YES
Num. obs.	259	259
R^2	0.57	0.58

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$. Robust standard errors are reported in parentheses.

Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level.

We find a negative and statistically significant coefficient on the equity share of assets backing euro-guaranteed policies across specifications. A higher equity allocation in these portfolios is associated with lower ROA, even as we (i) use lagged equity shares and (ii) control for stock-market performance (CAC 40). This pattern is consistent with the economics of guaranteed business. First, equities attract material Solvency II capital charges (equivalent to extra 39% for EEA equities and 49% for non-EEA), which raise the cost of capital and depress net returns on assets after capital costs are accounted for (Laboul and Deputy-Director 2015). Second, higher equity exposure introduces valuation volatility that interacts with profit-sharing and smoothing rules in guaranteed contracts: adverse equity moves require additional

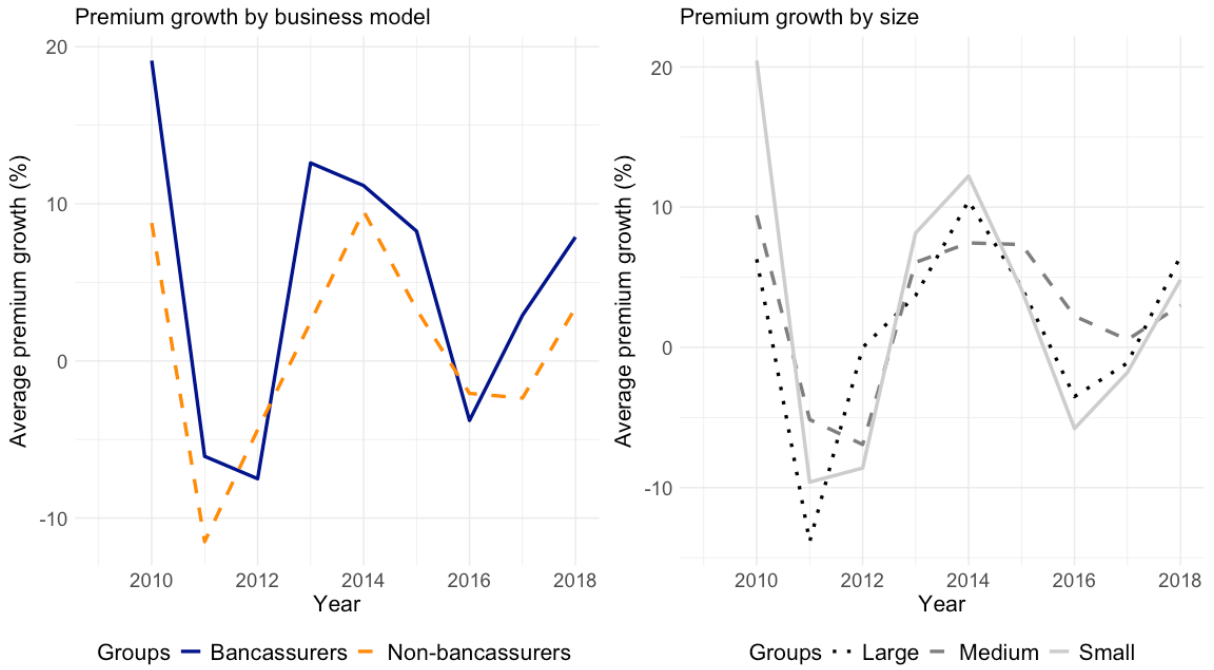
provisioning (e.g., to the profit-sharing reserve) or reduce discretionary crediting rates, both of which compress contemporaneous accounting profits. Third, equities worsen asset–liability mismatch for liabilities with minimum guarantees and long duration, prompting costly hedging or liquidity buffers that further weigh on ROA. Importantly, our equity measure excludes unit-linked assets—where market risk is largely borne by policyholders—so the negative association is specific to the guaranteed-rate business model rather than a general equity–profitability relation.

Table 6 in Appendix reports the same benchmark regression augmented with the lagged dependent variable (indicators ROA_{t-1}), as a robustness check, to capture profitability persistence and serial correlation in the error term, with the results virtually unchanged.

5.3. Heterogeneity results

While size has traditionally been the primary measure of heterogeneity in the literature for bank and non-bank financial intermediaries, our data reveal significant differences in monetary policy transmission within the life insurance sector when considering business model categories. Figure 3 and Figure 5 illustrate the sample's heterogeneity using the legal classification, focusing on the guaranteed yield spread and premium growth. These figures highlight the competitive advantage of *bancassurers*, who experience the highest premium increases while simultaneously lowering their guaranteed rates more rapidly than competitors. This discrepancy, not explained by size alone, justifies the use of an alternative classification.

Fig. 5 Premium growth heterogeneity: Legal vs. Size classifications



Note: Individual insurers' financial statements and AM Best data. Insurers are ranked by average asset size and divided into terciles for balanced sample sizes.

Table 3 reports the results of panel regressions assessing the heterogeneous effects of monetary policy shocks on insurers' profitability across the bancassurer vs non bancassurer business models. Model (1) includes only the interaction between the monetary policy shock (MPS FR10Y) and a dummy identifying bancassurers. The coefficient on the interaction term is small and statistically insignificant, suggesting that the immediate response of bancassurers to monetary policy shocks does not differ substantially from that of other insurers when heterogeneity in guaranteed yields is not accounted for.

Model (2) extends the baseline specification by introducing the Guaranteed Yield Spread (GYS), defined as the difference between the average guaranteed yield offered on policies and the return on investments (ROI). The positive and highly significant coefficient on GYS indicates that higher guaranteed yield spreads are associated with greater profitability for non-bancassurers, consistent with insurers' ability to have higher profitability in periods of higher spread between what the insurer earns from investments and what it gives backs to policyholders. However, the interaction between the monetary policy shock (MPS FR10Y) and GYS is positive, suggesting that monetary policy easings (negative FR10Y shocks) reduce the

profitability advantage of non-bancassurers with wider guaranteed yield spreads. The interaction between GYS and the Bancassurer dummy further indicates that this relationship is reversed for bancassurers, implying that tighter guaranteed yield spreads have little or no effect on their profitability. Importantly, the triple interaction term between the monetary policy shock, GYS, and the Bancassurer dummy is negative and statistically significant. This result suggests that bancassurers react differently to monetary easings: they experience a more favorable profitability response when guaranteed yield spreads tighten, likely due to their greater flexibility in adjusting policies' yields while they maintain a stable inflow of new premiums.

Model (3) refines this analysis by employing a backward-looking measure of the GYS, computed as a four-year moving average of the Yield on Guaranteed Contracts (YGC) : ($\text{GYS}_t = ROI_t - \frac{YGC_t+YGC_{t-1}+YGC_{t-2}+YGC_{t-3}}{4}$). This alternative specification accounts for the inertia in insurers' liabilities, stemming from legacy contracts that, although no longer marketed, continue to deliver comparatively high guaranteed yields. The results remain consistent with those of Model (2): higher backward-looking guaranteed yield spreads are associated with greater profitability, while monetary policy easings dampen this advantage. Moreover, the negative and significant triple interaction between the monetary policy shock, the backward-looking GYS, and the Bancassurer dummy persists, indicating that bancassurers remain less sensitive to profitability pressures during periods of low interest rates. Overall, these findings reinforce that the heterogeneous response to monetary policy is not driven by short-term yield dynamics, but by structural differences in liability management and product repricing between bancassurers and other insurers.

Table 3 Benchmark heterogeneous regressions results - Return on Assets

	(1)	(2)	(3)
Model (1): MP Shock only			
MPS FR10Y	0.00		
	(0.05)		
MPS FR10Y × Bancassurer dummy	−0.06		
	(0.06)		
Model (2): MP Shock × GYS (mean)			
MPS FR10Y		−0.08	
		(0.05)	
GYS (mean)		0.73***	
		(0.24)	
MPS FR10Y × GYS (mean)		0.12**	
		(0.05)	
GYS (mean) × Bancassurer dummy		−0.76***	
		(0.26)	
MPS FR10Y × GYS (mean) × Bancassurer dummy		−0.09*	
		(0.05)	
Model (3): MP Shock × GYS (backward-looking)			
MPS FR10Y			−0.04
			(0.05)
GYS (backward-looking)			0.70***
			(0.24)
MPS FR10Y × GYS (backward-looking)			0.12**
			(0.05)
GYS (backward-looking) × Bancassurer dummy			−0.83***
			(0.28)
MPS FR10Y × GYS (backward-looking) × Bancassurer dummy			−0.10**
			(0.05)
Rest of variables			
L1. Log gross written premiums	−2.95***	−2.95***	−3.19***
	(0.60)	(0.59)	(0.73)
L1. Share of equities	−0.17**	−0.21***	−0.21***
	(0.07)	(0.07)	(0.07)
L1. Net reserves ratio	−0.03	−0.07	−0.08
	(0.05)	(0.05)	(0.05)
L1. Share of unit-linked policies	0.12*	0.12*	0.12
	(0.07)	(0.07)	(0.07)
L1. CAC 40	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)
L1. Real GDP YoY	−0.19	−0.22*	−0.25*
	(0.13)	(0.13)	(0.14)
FE	*YES*	*YES*	*YES*
Num. obs.	259	259	254
R^2	0.60	0.64	0.62

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. Guaranteed yield spread (backward-looking) is calculated as the difference between the return on investments and the 4 year backward moving average of the yield on guaranteed policies. The Bancassurer dummy equals 1 for firms being part of a banking-led financial conglomerate and 0 otherwise.

While business model categories offer valuable insights, other factors like portfolio allocation (equities vs. bonds), unit-linked policies, the guaranteed yield spread, and the net reserves ratio significantly shape how monetary policy impacts profitability. These variables are key to understanding how different insurers respond to monetary policy and the rise of the

bancassurance model. Bancassurers, with more diverse portfolios and stronger financial integration, have greater flexibility and resilience to policy shifts, highlighting the importance of portfolio management in profitability analysis.

Table 4 examines the role of insurers' legal classification by interacting individual balance sheet characteristics with the business model. Building on the baseline results reported in **Table 3**, this specification adds interactions for the share of equities, the net reserves ratio, and the share of unit-linked assets to disentangle their respective contributions to profitability. Among these characteristics, only the share of equities shows a consistent and statistically significant effect across specifications. Specifically, for bancassurers, a one-percentage-point increase in the equity share in the previous year raises profitability by about 0.12 percentage points—the sum of the main and interaction effects (−0.17 + 0.29)—which is higher than the baseline effect of monetary policy shocks (0.08). In contrast, the effect is negative for non-bancassurers. This suggests that equity exposure does not uniformly translate into higher returns. For non-bancassurers, it may instead reflect greater exposure to market volatility. Bancassurers, on the other hand, may benefit from more diversified equity portfolios and stronger risk management practices, including greater access to foreign markets beyond the domestic (French) bias.

Table 4 Heterogeneous model results - Return on Assets

	(1)	(2)	(3)
Model (1): MP Shock only			
MPS FR10Y	0.00		
	(0.05)		
MPS FR10Y × Bancassurer dummy	−0.06		
	(0.06)		
Model (2): MP Shock × GYS (mean)			
MPS FR10Y		−0.08	
		(0.05)	
GYS (mean)		0.73***	
		(0.24)	
MPS FR10Y × GYS (mean)		0.12**	
		(0.05)	
GYS (mean) × Bancassurer dummy		−0.76***	
		(0.26)	
MPS FR10Y × GYS (mean) × Bancassurer dummy		−0.09*	
		(0.05)	
Model (3): MP Shock × GYS (backward-looking)			
MPS FR10Y			−0.04
			(0.05)
GYS (backward-looking)			0.70***
			(0.24)
MPS FR10Y × GYS (backward-looking)			0.12**
			(0.05)
GYS (backward-looking) × Bancassurer dummy			−0.83***
			(0.28)
MPS FR10Y × GYS (backward-looking) × Bancassurer dummy			−0.10**
			(0.05)
Rest of variables			
L1. Log gross written premiums	−2.95***	−2.95***	−3.19***
	(0.60)	(0.59)	(0.73)
L1. Share of equities	−0.17**	−0.21***	−0.21***
	(0.07)	(0.07)	(0.07)
L1. Net reserves ratio	−0.03	−0.07	−0.08
	(0.05)	(0.05)	(0.05)
L1. Share of unit-linked policies	0.12*	0.12*	0.12
	(0.07)	(0.07)	(0.07)
L1. CAC 40	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)
L1. Real GDP YoY	−0.19	−0.22*	−0.25*
	(0.13)	(0.13)	(0.14)
Interactions			
L1. Equities × Bancassurer dummy	0.29***	0.30***	0.29***
	(0.09)	(0.08)	(0.08)
L1. Net reserves × Bancassurer dummy	−0.16	−0.11	−0.04
	(0.11)	(0.11)	(0.11)
L1. Unit-linked × Bancassurer dummy	−0.15	−0.18	−0.18
	(0.11)	(0.12)	(0.12)
FE	*YES*	*YES*	*YES*
Num. obs.	259	259	254
R^2	0.60	0.64	0.62

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. Guaranteed yield spread (backward-looking) is calculated as the difference between the return on investments and the 4 year backward moving average of the

yield on guaranteed policies. The Bancassurer dummy equals 1 for firms being part of a banking-led financial conglomerate and 0 otherwise.

The coefficient of 0.12 on the lagged share of unit-linked policies for non-bancassurers indicates that increasing the proportion of unit-linked products in their portfolio is associated with higher profitability. This suggests that non-bancassurers benefit from shifting toward products that transfer investment risk to policyholders, thereby reducing the burden of guaranteed returns in a low-yield environment. In contrast, for bancassurers—whose portfolios already contain higher levels of unit-linked products—the effect is statistically insignificant. This likely reflects their ability to continue offering lower guaranteed yields on traditional contracts without compromising the growth of new gross written premiums, limiting the marginal profitability gains from further expanding their unit-linked segment.

5.4. Robustness

We assess robustness in three ways: (i) re-estimating with an alternative monetary policy proxy, (ii) testing for size as a driver of the transmission of monetary policy, iii) a specification with the return on equity as profitability metric.

Table 7 in Appendix examines how unconventional monetary policy and the prolonged low-yield environment affect life insurer profitability, employing the ECB shadow rate from (Wu and Xia, 2016) as an alternative monetary policy variable. The findings largely corroborate the previous results, with a negative significant coefficient for the monetary policy variables and a positive coefficient for the interaction between the monetary policy variable and the Guaranteed Yield Spread (GYS) for non-bancassurers, while the triple ECB shadow rate interaction with the GYS and the bancassurer dummy gives a negative significative coefficient and the equity share interaction with the bancassurer dummy gives very similar interpretations as using the ECB monetary policy shock benchmark specification. This suggests that bancassurers are better equipped to thrive in a low-yield setting.

Additionally, **Table 8** in Appendix shows that size-based classifications have limited relevance for explaining how monetary policy transmits to life insurers' profitability—either directly or through its interaction with the guaranteed yield spread. We find no systematic size effects on the income channel, reinforcing that business model—not firm scale—is the salient dimension.

Table 9 in Appendix provides additional confirmation of these findings using an alternative profitability measure, the Return on Equity (ROE), which is widely used by regulators to assess the financial health of life insurance companies. The results reveal the transmission of monetary policy to non-bancassurers throughout the guaranteed yield spread, with the interaction between the monetary policy shock and the GYS being positive and significative, highlighting the role of the income channel in shaping monetary policy transmission.

As an additional robustness exercise, we examine in **Table 10** whether monetary policy—and its interaction with bancassurer affiliation—shapes key insurer-level variables: gross written premiums (GWP), the share of unit-linked assets, the share of equities, and the net reserves ratio. Across specifications, effects are generally small. Bancassurers systematically display higher unit-linked shares and lower net-reserves ratios, but the policy shock itself is substantively relevant only for equities and net reserves. A surprise monetary easing (negative shock to yields) is associated with a higher equity share (and, by implication, a relative move away from bonds), consistent with "hunt-for-yield" behavior documented in the literature; it is also linked to an increase in the net-reserves ratio, plausibly reflecting higher technical reserves required by a shift toward riskier asset allocations. These results underscore the importance of these individual characteristics for transmission and motivate our baseline dynamic specification with lagged dependent variables, which helps mitigate endogeneity and reverse-causality concerns when relating profitability to balance-sheet adjustment.

6. Conclusion

This paper identifies and quantifies an income channel through which monetary policy transmits to the life-insurance sector. By reconstructing insurers' guaranteed yield spread (GYS)—the gap between portfolio returns and guaranteed policies' rates—we show that liability pricing is a central mechanism governing how monetary policy influences profitability. The results show that a surprise monetary policy easing improves the return on assets, consistent with the economic activity channel. Importantly, we show that monetary policy has a stronger effect on profitability when the GYS, indicating that profitability is more sensitive for insurers whose business models rely on maintaining a large margin between portfolio returns and guaranteed rates. These results are robust across specifications, including a backward-looking GYS that captures the slow-moving nature of legacy liabilities.

We also uncover economically meaningful heterogeneity by business model. Insurers affiliated with banking groups—the bancassurance model—reprice liabilities more quickly, lowering guaranteed rates faster while sustaining above-average premium growth. Conditional on firm fundamentals, bancassurers exhibit higher ROA in low-yield environments. Part of this advantage is associated with a greater equity share in assets backing euro-guaranteed policies relative to bonds, consistent with more diversified portfolios, including exposures beyond the domestic market, which can smooth returns. Together, these patterns highlight liability repricing and asset-allocation flexibility as key margins of adjustment.

Our evidence also speaks to the competitive landscape and the behavior of financial conglomerates over the rate cycle. In prolonged low-yield periods, bancassurers' faster pass-through and stronger distribution give them a comparative advantage, shifting relative profitability and premium growth within the sector. Because these insurers are embedded in banking groups, shocks that affect banks—such as liquidity pressures, lending slowdowns, or branch rationalization—can propagate to the insurance arm via distribution channels, introducing pro-cyclical variation in policy sales and market shares.

Taken together, bancassurers' higher equity shares and lower net-reserve ratios are consistent with more diversified portfolios and greater adaptability to low-yield conditions, supporting resilience when margins tighten. From a supervisory perspective, transparency around credited-rate setting should be enhanced and product-level disclosures strengthened, with liability-side stress tests conducted routinely across business models. At the conglomerate level, stress-testing frameworks should jointly model banks and insurers to trace intra-group channels and the cross-sector transmission of shocks (Sydow et al. 2024).

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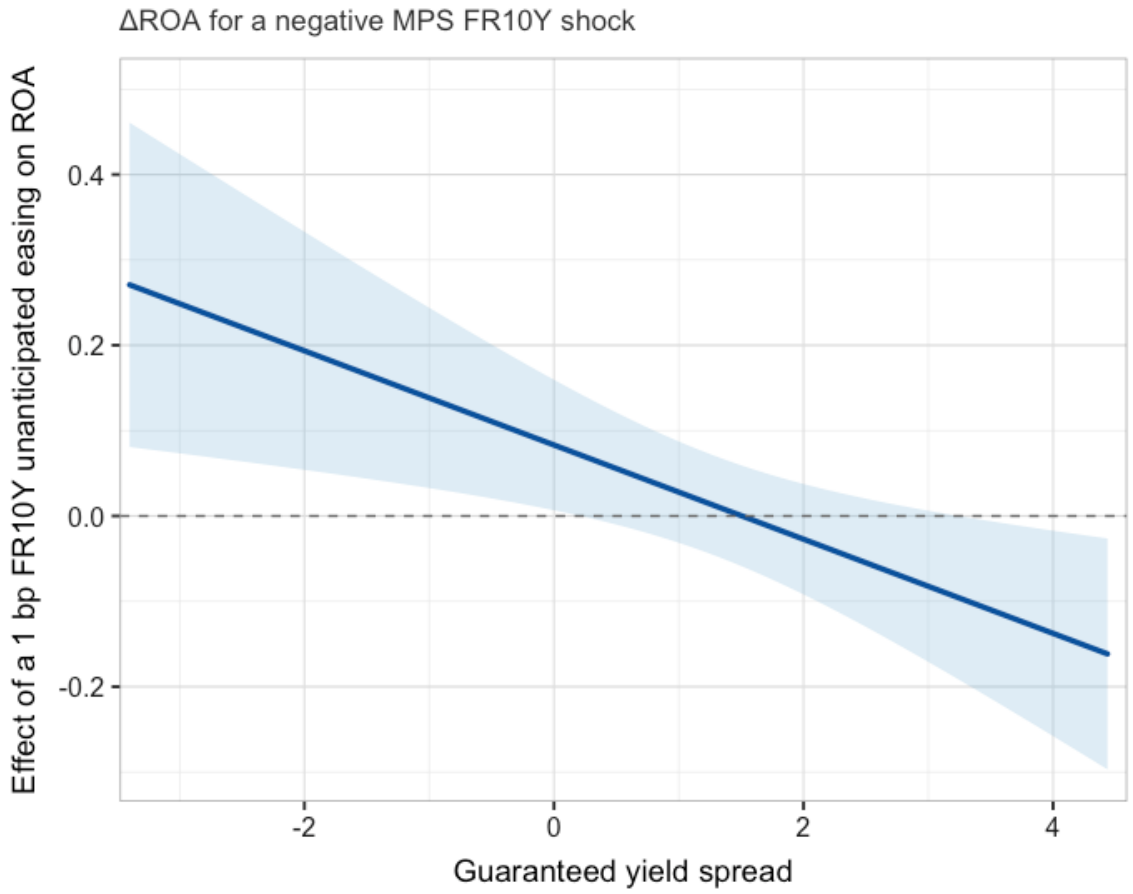
A. Appendix

Table 5 Life insurance companies by category

• **Bancassurers:** Credit Agricole, Cardif Assurance Vie, SOGECAP, BPCE Vie, Groupe des Assurances du Credit Mutuel, Suravenir, HSBC Vie France, PREPAR Vie, Neuflize Vie, Assurances Credit Mutuel Nord Vie, Oradea Vie, AGEAS France
• **Non-bancassurers :** CNP Assurances, AXA France Vie, Generali Vie SA France, Allianz Vie, Swisslife France, Aviva Vie, Unofi Assurances SA, Mondiale Société Asr Mutuelle sur la Vie, Groupama GAN Vie, Mutavie, MACSF Epargne Retraite, Parnasse MAIF, AGPM, CARAC Mutuelle d'Epargne Retraite Prevoyance, APICIL Epargne, CAPMA CAPMI, SAF BTP Vie, Monceau Retraite Epargne, Covea

Note : The table above lists the companies included in our analysis operating in the French life insurance market over the 2009-2018 period, classified by business model.

Fig. 6 Net investment spread per EU country



Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. The marginal plot represents a marginal plot of the interaction between the two components at the 90% confidence level.

Table 6 Benchmark results using lagged dependent ROA variable

	Return on Assets (ROA)	
	(1)	(2)
L1. ROA	0.06	0.06
	(0.10)	(0.09)
Monetary Policy Shock FR10Y (MPSFR10Y)	−0.02	−0.07**
	(0.03)	(0.04)
Guaranteed yield spread (GYS)	0.15*	0.21**
	(0.08)	(0.10)
MPSFR10Y × GYS		0.05**
		(0.02)
L1. Log gross written premiums	−2.34***	−2.40***
	(0.55)	(0.58)
L1. Share of equities	−0.09	−0.10*
	(0.06)	(0.06)
L1. Net reserves ratio	−0.02	−0.03
	(0.05)	(0.05)
L1. Share of unit-linked policies	0.08	0.06
	(0.06)	(0.05)
L1. CAC 40 index	−0.00	−0.01
	(0.01)	(0.01)
L1. Real GDP YoY	−0.20	−0.22
	(0.14)	(0.14)
FE	YES	YES
Num. obs.	259	259
R^2	0.58	0.59

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. The dependent variable Return on Assets (ROA) is lagged one period in the specification.

Table 7 Benchmark model results - Return on Assets with ECB shadow rate

	(1)	(2)
ECB shadow rate (ECB SR)	−0.32***	−0.36***
	(0.10)	(0.10)
Guaranteed yield spread (GYS)	0.07	0.77**
	(0.08)	(0.30)
ECB SR × GYS		0.18***
		(0.06)
L1. Log gross written premiums	−3.50***	−3.38***
	(0.70)	(0.65)
L1. Share of equities	−0.23***	−0.25***
	(0.07)	(0.07)
L1. Net reserves ratio	−0.09*	−0.11**
	(0.05)	(0.05)
L1. Share of unit-linked policies	0.00	0.01
	(0.06)	(0.07)
L1. CAC 40 index	−0.01	−0.01
	(0.01)	(0.01)
L1. Real GDP YoY	−0.27**	−0.28**
	(0.13)	(0.12)
ECB SR × Bancassurer dummy	0.05	0.08
	(0.13)	(0.13)
GYS × Bancassurer dummy		−0.85***
		(0.32)
ECB SR × GYS × Bancassurer dummy		−0.18***
		(0.06)
L1. Equities × Bancassurer dummy	0.28***	0.29***
	(0.09)	(0.09)
L1. Net reserves × Bancassurer dummy	−0.13	−0.09
	(0.10)	(0.10)
L1. Unit-linked × Bancassurer dummy	−0.09	−0.13
	(0.12)	(0.12)
FE	*YES*	*YES*
Num. obs.	259	259
R^2	0.63	0.66

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: ECB shadow rate from (Wu and Xia, 2016). Guaranteed yield spread is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level.

Table 8 Heterogeneous regressions results - Size categories

	(1)	(2)	(3)
Model (1): MP Shock only			
MPS FR10Y	−0.04		
	(0.04)		
MPS FR10Y × Large	0.03		
	(0.06)		
Model (2): MP Shock × GYS (mean)			
MPS FR10Y		−0.08*	
		(0.05)	
GYS (mean)		0.21*	
		(0.12)	
MPS FR10Y × GYS (mean)		0.04*	
		(0.03)	
GYS (mean) × Large		−0.05	
		(0.20)	
MPS FR10Y × GYS (mean) × Large		0.05	
		(0.04)	
Model (3): MP Shock × GYS (backward-looking			
MPS FR10Y			−0.06
			(0.04)
GYS (backward-looking)			0.30
			(0.19)
MPS FR10Y × GYS (backward-looking)			0.06*
			(0.04)
GYS (backward-looking) × Large			−0.18
			(0.25)
MPS FR10Y × GYS (backward-looking) × Large			0.04
			(0.04)
Rest of variables			
L1. Log gross written premiums	−2.51***	−2.56***	−3.05***
	(0.53)	(0.58)	(0.71)
L1. Share of equities	−0.10*	−0.12*	−0.11*
	(0.06)	(0.06)	(0.06)
L1. Net reserves ratio	−0.02	−0.03	−0.04
	(0.05)	(0.05)	(0.05)
L1. Share of unit-linked policies	0.07	0.06	0.06
	(0.05)	(0.05)	(0.05)
L1. CAC 40	−0.01	−0.00	−0.00
	(0.01)	(0.01)	(0.01)
L1. Real GDP YoY	−0.25*	−0.26*	−0.31**
	(0.14)	(0.14)	(0.15)
FE	*YES*	*YES*	*YES*
Num. obs.	259	259	254
R^2	0.57	0.59	0.58

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. Guaranteed yield spread (backward-looking) is calculated as the difference between the return on investments and the 4 year backward moving average of the yield on guaranteed policies. The Large dummy equals 1 for firms in the top third tercile in terms of total assets and 0 otherwise.

Table 9 Heterogeneous model robustness - Return on Equity (ROE) model

	(1)	(2)	(3)
Model (1): MPS FR10Y (baseline)			
Monetary policy shock (MPS FR10Y)	0.70		
	(0.80)		
MPS FR10Y × Bancassurer dummy	−1.90*		
	(1.13)		
Model (2): MPS FR10Y × GYS (mean)			
MPS FR10Y		−0.98	
		(1.18)	
Guaranteed yield spread (mean)		13.01**	
		(5.49)	
MPS FR10Y × GYS (mean)		2.25**	
		(0.93)	
GYS (mean) × Bancassurer dummy		−12.94**	
		(5.97)	
MPS FR10Y × GYS (mean) × Bancassurer dummy		−1.71	
		(1.04)	
Model (3): MPS FR10Y × GYS (backward-looking)			
MPS FR10Y			−0.31
			(0.98)
GYS (backward-looking)			12.57**
			(5.51)
MPS FR10Y × GYS (backward-looking)			2.37**
			(0.93)
GYS (backward-looking) × Bancassurer dummy			−15.73**
			(6.42)
MPS FR10Y × GYS (backward-looking) × Bancassurer dummy			−2.18**
			(1.09)
Rest of variables			
L1. Log gross written premiums	−30.80**	−30.58**	−31.12**
	(12.03)	(12.28)	(14.39)
L1. Share of equities	−2.50**	−3.19***	−3.22***
	(1.17)	(1.15)	(1.15)
L1. Net reserves ratio	0.84	0.08	−0.04
	(1.45)	(1.23)	(1.17)
L1. Share of unit-linked policies	2.33*	2.19	2.06
	(1.31)	(1.40)	(1.40)
L1. CAC 40 index	−0.17	−0.08	−0.11
	(0.29)	(0.29)	(0.29)
L1. Real GDP YoY	−4.48	−5.13*	−5.36*
	(3.10)	(3.07)	(3.19)
L1. Equities × Bancassurer dummy	5.11***	5.42***	5.25***
	(1.83)	(1.89)	(1.88)
L1. Net reserves × Bancassurer dummy	−2.60	−1.80	−0.09
	(2.45)	(2.38)	(2.60)
L1. Unit-linked × Bancassurer dummy	−2.35	−2.61	−2.72
	(2.84)	(3.14)	(3.25)
FE	*YES*	*YES*	*YES*
Num. obs.	259	259	254
R^2	0.49	0.52	0.51

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: Dependent variable is the Return on equity (ROE), calculated as the net profit over the three-year moving average shareholders' equity (from AMBEST data). The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). Guaranteed yield spread (mean) is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level. Guaranteed yield spread (backward-looking) is calculated as the difference between the return on investments and the 4 year backward moving average of the yield on guaranteed policies.

Table 10 Insurer specific characteristics as dependent variables

	logGWP		LINKED		EQTT		NRNWP	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	7.15***	7.12***	9.27***	9.76***	13.24***	13.37***	10.94***	10.85***
	(0.45)	(0.45)	(2.03)	(2.36)	(2.70)	(2.82)	(0.93)	(0.97)
Monetary policy shock (MPS FR10Y)	-0.07	-0.07	-0.60	-0.66	-1.11***	-1.13***	-0.52***	-0.52***
	(0.04)	(0.04)	(0.53)	(0.44)	(0.31)	(0.32)	(0.11)	(0.10)
Guaranteed yield spread (GYS)	0.05	0.06	1.07	0.91	0.20	0.11	0.11	0.12
	(0.12)	(0.12)	(0.76)	(0.87)	(0.45)	(0.45)	(0.20)	(0.21)
Bancassurer dummy	0.45	0.43	16.14**	16.09**	-0.20	0.07	-3.33***	-3.23***
	(0.61)	(0.60)	(6.22)	(6.23)	(3.25)	(3.12)	(0.99)	(0.98)
MPS FR10Y × GYS		0.02		-0.14		-0.19		-0.02
		(0.02)		(0.30)		(0.20)		(0.07)
MPS FR10Y × GYS × Bancassurer dummy		-0.01		-0.05		0.15		0.07
		(0.01)		(0.12)		(0.15)		(0.05)
FE	YES	YES	YES	YES	YES	YES	YES	YES
Num. obs.	301	301	301	301	302	302	291	291
R^2	0.02	0.03	0.24	0.24	0.04	0.04	0.24	0.25

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. Robust standard errors are reported in parentheses.

Note: The dependent variables are the log of the gross written premiums for specifications (1) and (2), the share of unit-linked assets for model (3) and (4), the share of equity investments for assets linked to euro-guaranteed policies (compared to bonds) for (5) and (6) and the net reserves to net written premiums for specification (7) and (8). The MPS FR10Y comes from the EA-MPD dataset (Altavilla et al. 2019). The GYS is calculated as the yearly difference between the Return on Investments and the average yield on guaranteed policies at the insurer level.