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Measuring the systemic importance and resilience of the building societies sector

Research report

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Executive summary

Building societies are a significant and resilient component of the UK financial system, holding over £600 billion in assets and providing nearly 30% of UK mortgage lending. Despite their scale and macrofinancial relevance, their contribution to systemic risk has been largely overlooked due to their mutual structure and non-listed status, which exclude them from conventional market-based risk assessments. This report addresses this gap by providing a comprehensive sector-wide assessment of systemic risk and resilience in UK building societies. Our data are provided by the Building Societies Association (BSA) and includes 67 UK building societies over 2000–2024, of which 42 remained active in 2024. The empirical analysis combines accounting-based and market-based approaches, specifically, employing Z-scores to evaluate solvency-based resilience and the Leave-One-Out (LOO) Z-score transformation to measure systemic contribution. For market-based systemic risk estimation, the report builds on recent developments in the literature (Engle et al., 2024; Engle & Jung, 2023; Skouralis, 2026a) by indirectly estimating firm-level SRISK, which measures the expected capital shortfall of a financial institution in a systemic crisis, using balance-sheet fundamentals in place of missing market data for non-listed institutions. Finally, to the best of our knowledge, this study is the first to estimate Exposure–ΔCoVaR for non-listed firms using asset-growth series, allowing an assessment of the sector's sensitivity to system-wide financial stress.

The main empirical findings are as follows:

- **Growing macrofinancial significance:** Building society assets increased from around £150 billion in 2000 to over £600 billion in 2024, and they currently hold a 6.4% share of total UK financial system assets.

- **Stronger solvency and conservative balance sheets:** Building societies maintain higher equity-to-asset ratios than those of banks and operate with lower but more stable earnings, making them systematically less risky and less volatile across the financial cycle.

- **Countercyclical credit behaviour:** Their retail funding model and limited wholesale exposure result in lower leverage, lower insolvency risk, and stronger performance under stress, with asset growth far less procyclical than in the banking sector.

- **Higher distance to default:** Sector Z-scores are consistently higher than banks, indicating substantially lower default risk. Z-scores remained elevated even during the Global Financial Crisis and COVID-19 shocks, demonstrating balance-sheet resilience.

- **Positive stability contribution:** Including building societies in aggregate Z-score estimates raises system-wide solvency by 2–5% per year, confirming that the sector enhances financial stability, especially during periods of systemic stress.

- **Stability driven by smaller institutions:** Excluding the five largest building societies increases the sector Z-score by 15–25%, demonstrating that small and mid-sized building societies provide the strongest stabilising effect in the sector.

- **Low systemic risk footprint:** Indirect SRISK estimates show building societies contributed only 3.5% of UK total SRISK in 2024 and 6% when considering only banks and building societies together.
- **Systemic risk concentrated at the top:** 92% of mutual sector SRISK originates from the five largest societies (Nationwide, Coventry, Yorkshire, Skipton, and Leeds), reflecting size-based concentration risk, though even these remain far less systemic than major commercial banks.
- **Moderate exposure to systemic shocks:** Exposure–ΔCoVaR results show that building societies are exposed to systemic distress, with their asset growth declining by around 2.5–4.5% during periods of system-wide stress. However, their systemic exposure is significantly lower than that of banks, whose balance-sheet growth contracts by 6–10% under similar conditions. This confirms that while building societies are not immune to systemic shocks, they are far less prone to amplify them.
- **Systemic importance is limited to a small subset of institutions:** The sector does not present hidden systemic fragility. A few large societies exhibit moderate systemic relevance, but the majority of building societies are not systemically important. Across all metrics (Z-scores, SRISK, and ΔCoVaR), the evidence shows low interconnectedness and low contagion risk for most institutions, reinforcing the view that the mutual model supports structural resilience rather than systemic vulnerability.

These findings have direct implications for prudential policy and macrofinancial supervision:

‣ **Extend market-based systemic risk coverage to non-listed institutions:** While certain systemically significant building societies are included in supervisory stress testing, non-listed institutions are generally excluded from traditional market-based systemic risk measures due to the absence of equity price data. The proposed accounting-based SRISK and Exposure–ΔCoVaR framework enables consistent inclusion of non-listed institutions and could complement existing systemic risk indicators within the UK macroprudential toolkit.

‣ **Maintain proportionate regulation:** Building societies exhibit low systemic risk and strengthen financial stability; regulatory requirements should remain proportionate and risk-based, rather than bank-centric.

‣ **Enhance supervisory focus on the largest societies:** Systemic risk is concentrated in the five largest institutions. While supervisory intensity is already scaled to size and complexity, these findings provide quantitative support for continued close oversight of the largest societies without extending unnecessary regulatory burdens to smaller institutions.

‣ **Preserve institutional diversity:** The mutual model provides countercyclical stability and limits correlated risk exposures; maintaining a diverse financial system should remain an explicit macroprudential objective.

‣ **Monitor housing market and funding concentration risk:** The growing mortgage market share and retail deposit concentration of building societies require ongoing monitoring under adverse housing and funding conditions.

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1. Introduction

Building societies are a central yet understudied component of the UK financial system, with growing relevance for both financial intermediation and macroprudential policy. According to firms' annual reports and data from the BSA and the BoE, the sector holds over £600 billion in assets, provides almost 30% of UK mortgage lending, and accounts for over 20% of household deposits. With 42 active building societies operating more than 1,400 branches across the UK, the sector plays a critical role in advancing financial inclusion and supporting local economic resilience (BSA, 2025). Their mutual ownership and reliance on retail savings (rather than wholesale funding) differentiates them from commercial banks and has historically demonstrated resilience to macroeconomic shocks due to stronger capitalisation and more prudent lending practices (Gerken, 2025). The academic literature on cooperative and mutual banking systems finds that depositor-owned institutions generally display greater funding stability and lower risk-taking incentives (Hesse & Čihák, 2007; Ayadi et al., 2010). These findings are consistent with UK evidence on the building societies sector (Casu, 2015; Skouralis, 2026a).

Despite their historically conservative risk profile, building societies face increasing supervisory attention as their collective size and role in mortgage lending continue to expand. In May 2025, the Prudential Regulation Authority (PRA) confirmed the withdrawal of Supervisory Statement 20/15 (SS20/15), which had governed mortgage lending and risk management standards for building societies since 2015. As a result, the regulatory environment for building societies is undergoing its most significant transformation since the post-crisis period. Future oversight (starting from 2027) of the sector will be embedded within the Strong and Simple Framework for smaller, domestically focused deposit-takers, an approach intended to maintain resilience while aligning prudential requirements with institutional risk profiles (PRA, 2025). This shift reflects a regulatory repositioning, since building societies are increasingly recognised as structurally important domestic lenders that support competition and financial stability in retail banking.

Currently, despite their scale and sectoral concentration, building societies remain underexamined in terms of their contribution to systemic risk and potential role in stress transmission. Only Nationwide has been designated as a domestic Other Systemically Important Institution (O-SII) and is subject to a 1% O-SII buffer, and no other building society currently carries formal systemic designation despite the sector's substantial collective market share. However, the BoE has repeatedly noted that systemic risk can arise not only from individual large institutions but also from groups of mid-sized firms with correlated exposures (BoE, 2023). This is consistent with the Financial Policy Committee's (FPC) view that systemic risk may be collective rather than individual, emerging from common exposures, particularly to the mortgage market, and from funding behaviours that may amplify stress across the UK financial system.

Assessing these risks requires a clear understanding of what systemic risk is and how it is measured. The concept of systemic risk gained prominence during the 2007–2009 Global Financial Crisis (GFC), when the failure of large banks transmitted shocks quickly across borders and markets, intensifying economic disruption. In terms of definition, systemic risk refers to the risk that distress in a single financial institution or sector can trigger widespread instability, impairing the functioning of the financial system and spilling over into the broader economy. The Bank for International Settlements defines systemic risk as the likelihood that an event will lead to a chain of adverse effects large enough to disrupt the financial system's functioning and confidence (BIS, 2001).[1] In the aftermath of the GFC, systemic risk was incorporated into macroprudential policy decisions and became a focal point of research and analysis for academics and policymakers (Acharya et al., 2025). Systemic risk remains complex, multidimensional, and often seen as a "*hard-to-define-but-you-know-it-when-you-see-it*" concept (Benoit et al., 2017), making it difficult to measure. A growing academic literature has developed measures to capture systemic risk, but has primarily focused on listed firms. Some of the most widely used firm-level measures include CoVaR (Adrian & Brunnermeier, 2016), which examines tail co-movements in financial returns, and SRISK (Brownlees & Engle, 2017), which estimates capital shortfalls under stress scenarios.

This report responds to the growing supervisory and policy interest in the resilience of building societies by providing a structured systemic risk assessment of the sector. It contributes to three main areas of analysis:

- First, it presents a long-run comparative analysis of the performance of the building societies sector relative to UK banks and other financial institutions over 2000–2024. The analysis covers asset growth, profitability, and capitalisation in order to evaluate the sector's financial resilience and structural vulnerabilities.

- Second, it evaluates the stability contribution of building societies to the UK financial system using the Z-score metric and an adjusted Leave-One-Out (LOO) Z-score framework. This allows for a quantification of each institution's contribution to aggregate sector solvency, identifying whether building societies act as stabilisers or potential amplifiers under stress.

- Third, it extends systemic risk measurement to non-listed institutions by applying a novel indirect SRISK estimation approach introduced by Engle et al. (2024) and adopted by Skouralis (2026a), which uses observable balance-sheet fundamentals as predictors of systemic risk. In addition, the report assesses building societies' sensitivity to system-wide stress using an asset-growth-based Exposure–ΔCoVaR by Adrian and Brunnermeier (2016), quantifying the extent to which distress in the sector is associated with tail risk in the broader financial system.

In summary, the results show that building societies operate under a low-risk, low-return model: they generate lower profitability than UK banks but maintain significantly stronger solvency buffers and more stable balance-sheet structures. They exhibit strong solvency resilience and account, on average, for around 3.5% of aggregate UK SRISK over the examined period.

[1] In addition, the European Central Bank (2009) highlights that systemic risk can stem from both external shocks and endogenous amplification mechanisms, such as fire sales, liquidity spirals, and interbank contagion. Billio et al. (2012) emphasise that systemic risk reflects the interconnectedness of institutions, whereby localised shocks can escalate into system-wide crises.

However, systemic risk within the sector is highly concentrated, with the five largest institutions responsible for approximately 92.5% of total building society SRISK in 2024, while smaller and medium-sized societies consistently act as net stabilisers. In terms of systemic exposure, building societies display significantly lower sensitivity to system-wide stress than UK banks, indicating a limited potential to exacerbate tail risk in the financial system.

These contributions provide a timely empirical assessment of the sector's resilience and collective risk profile. The analysis aligns with the Bank of England's system-wide approach to financial stability (BoE, 2025) and complements ongoing macroprudential initiatives to expand systemic risk monitoring beyond major banks (BoE's system-wide exploratory scenario (BoE, 2024). The increasing relevance of the sector is also reflected in its balance-sheet expansion. According to annual report data, the building society sector's total assets grew by more than 40% over the past five years, exceeding growth in both the UK banking sector (15.7%) and the wider financial system (8.8%), underscoring its expanding market footprint. The sector has also become increasingly concentrated, with the five largest building societies (Nationwide, Coventry, Yorkshire, Skipton, and Leeds) now controlling approximately 90% of total sector assets (BSA, 2025). Furthermore, Nationwide's acquisition of Virgin Money in 2024, the first major bank-to-mutual transfer in UK history, expanded Nationwide's balance sheet by around 35% to over £350 billion, consolidating market share and reshaping the structure of the UK mortgage and retail lending markets, with important implications for competition and systemic risk monitoring.

The report also contributes to a substantial body of academic literature that examines whether mutual and cooperative financial institutions exhibit greater resilience and lower risk than shareholder-owned banks. Several studies argue that the ownership and governance features of mutuals embed structural prudence, reducing incentives for speculative risk-taking and short-term profit maximisation. For example, Hesse and Čihák (2007) find that cooperative banks are more stable than commercial banks across 29 countries, owing to lower earnings volatility which helps to offset their lower profitability. Iannotta et al. (2007) show that European mutual banks have better loan quality and lower asset risk than both private and state-owned banks. Similarly, Ayadi et al. (2010) find that cooperative banks played a countercyclical role during the GFC by maintaining credit provision when commercial banks contracted lending. In addition, Michie and Llewellyn (2010) argue that mutuals enhance systemic resilience and competition, recommending the remutualisation of failed banks like Northern Rock as a structural solution to financial fragility in the UK. More recently, Chiaramonte et al. (2015) find that cooperative banks contributed positively to banking system stability during the crisis, particularly where they held substantial market share.

Evidence specific to UK building societies reaches similar conclusions. Casu (2015) reports lower volatility of earnings and net interest margins, higher Z-scores, and stronger post-crisis recovery for societies relative to banks, reinforcing the view that mutuals act as stabilisers rather than amplifiers of stress. Ayadi et al. (2025) further reinforce this business model perspective by demonstrating that financial institutions with retail-focused, deposit-funded balance sheets exhibit significantly lower systemic risk than market-oriented banks, particularly during periods of financial instability.

Complementing this, McKillop et al. (2020) synthesise cross-country evidence showing that financial cooperatives continued lending through downturns and maintained funding stability due to strong member loyalty and retail deposit bases. Historical evidence also supports these findings. Birchall (2013) shows that during both the Great Depression of the 1930s and the GFC of 2007/09, mutual and cooperative financial institutions acted as safe havens, retaining depositor confidence and demonstrating stronger survival capacity than commercial banks, which enabled them to continue supporting local economies when investor-owned banks contracted.

However, the literature also highlights important vulnerabilities and trade-offs within mutual and cooperative models. Fonteyne (2007) emphasises governance risks, noting that mutuals' absence of residual claimants can lead to managerial entrenchment and empire-building, especially in larger institutions without adequate oversight. Chaddad and Cook (2004) similarly argue that cooperative structures may suffer from collective action problems and weaker monitoring, which can erode governance quality as they grow. Mutuals may also face capital constraints, as their ability to recapitalise depends largely on retained earnings rather than equity issuance (Fonteyne, 2007; Michie & Llewellyn, 2010). In addition, their strong regional focus and member-based lending models can expose them to geographic and sectoral concentration risk, while their smaller average scale limits diversification opportunities (Wheelock & Wilson, 2011). Goddard et al. (2008) and McKillop et al. (2020) emphasise that the stability advantages of mutual institutions are not automatic but are conditional on effective governance discipline, strong network integration, and conservative capital management. Nonetheless, as Becchetti et al. (2016) show, these vulnerabilities do not outweigh the stability benefits of the mutual model: cooperative banks still display lower procyclicality, reduced leverage, and milder credit contractions in downturns compared to commercial banks. These studies highlight that mutuals can be exposed to concentration risk and limited access to external capital markets, but these vulnerabilities are mitigated when appropriate levels of monitoring and high-quality capital buffers are maintained across the sector.

In addition to examining the performance and financial resilience of the sector, this report advances the analysis and contributes to the aforementioned literature by focusing explicitly on the systemic risk profile of building societies. The existing literature on mutual and cooperative institutions provides mixed yet valuable insights into their stability characteristics. Ayadi et al. (2025) demonstrate that migration towards market-based funding models increases systemic risk, particularly during periods of financial stress, whereas retail-focused institutions remain more resilient. Complementing this, Mare and Gramlich (2021) show that cooperative banks' risk exposures display significant commonality across credit and interest rate risk factors, underscoring the potential for correlated shocks even among institutions with conservative profiles. At the same time, Pacelli et al. (2024) find that cooperative banks may dampen systemic risk transmission due to low interbank exposures and healthier solvency indicators, suggesting a potential buffering role.

This report builds on Skouralis (2026a), who provides the first evidence on the systemic relevance of non-listed UK financial institutions (including building societies, foreign-owned banks, and digital-only banks) by indirectly estimating SRISK and documenting a non-trivial systemic footprint for several large building societies. Extending that work, the present report adapts the SRISK methodology for a policy and practitioner audience, extends the analysis over a longer horizon (2000–2024) using proprietary BSA data, and introduces two complementary measures, the LOO Z-score and Exposure ΔCoVaR, to capture not only solvency- and market-based dimensions of systemic risk but also the degree of systemic exposure and resilience rather than systemic importance alone. This multimetric framework enables a robust assessment of whether building societies act as stabilisers or risk-propagating institutions under system-wide stress and directly informs the policy debate on whether macroprudential oversight should be extended more formally to the sector.

The rest of this report is structured as follows. Section 2 provides an overview of the data, sector coverage, and key descriptive trends in the building societies sector relative to the wider UK financial system. Section 3 evaluates the financial resilience of the sector using traditional accounting-based indicators, including capitalisation, profitability, liquidity, and the Z-score as a benchmark measure of firm-level stability. Section 4 extends the analysis to systemic risk by combining three complementary approaches: the LOO Z-score to assess stability contributions; SRISK to estimate systemic importance through capital shortfall under stress; and Exposure–ΔCoVaR to capture the sector's vulnerability to system-wide shocks. Section 5 discusses the policy implications of the findings for macroprudential supervision, and Section 6 concludes.

2. Data and sector overview

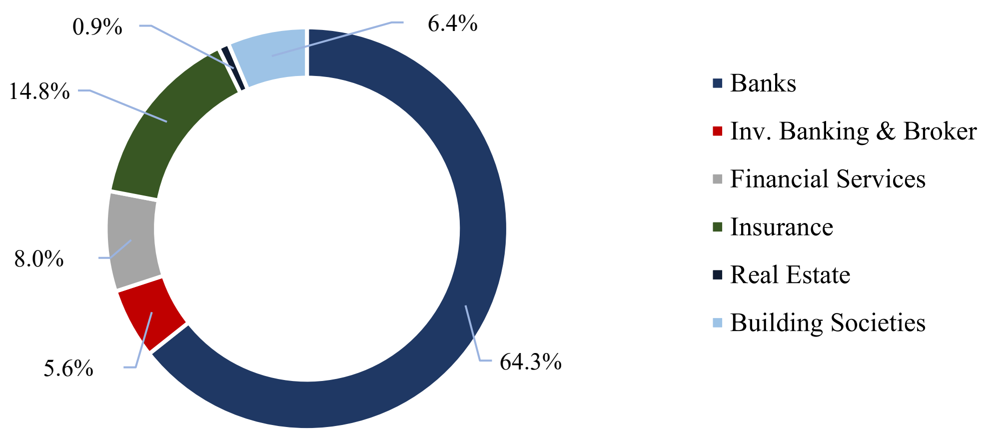
This study is based on a large dataset of UK building societies covering the period 2000–2024. The sample includes 67 institutions, of which 42 remained active at the end of 2024, representing the full population of the sector. The dataset, provided by the BSA[2], supports both cross-sectional and time-series analyses, enabling examination of sector dynamics around the GFC, the COVID-19 pandemic, and the recent period of geopolitical uncertainty. For comparative and systemic risk analyses, the study also employs a broad dataset of listed UK financial institutions, including commercial and investment banks, insurance companies, Real Estate Investment Trusts (REITs), and financial services firms. All data are sourced from Thomson Reuters Eikon Datastream, and include both active and delisted financial institutions.

Figure 1 presents the UK financial sector's composition in 2024. The financial system remained heavily bank-centred with banks accounting for more than £6 trillion in assets, or almost two-thirds of

[2] The BSA dataset is annual and based on building societies' published financial statements. For accuracy and completeness, we supplement this dataset with manually collected data from individual annual reports. While most building societies report on a calendar-year basis, some report according to the financial (tax) year. In such cases, we use the latest available annual report to ensure fuller coverage. For example, Nationwide's 2025 annual report (covering 2024 Q2–2025 Q1) is used instead of the 2024 report, which only covers data up to 2024 Q1.

the total market, underlining their continued dominance despite a long-term trend of relative decline. However, building societies also represent a significant component of this landscape. Since 2022, their assets have exceeded £600 billion, giving them a 6.4% share of the financial system in 2024. Based on the Eikon Datastream sample, this makes the sector larger than the investment banking and brokerage industry (5.6%) and comparable in scale to the broader financial services sector (8%). Although still smaller than insurers (£1.5 trillion, 14.8%) and commercial banks, building societies now represent a structurally important segment of the UK financial system with clear macroprudential relevance. The real estate finance[3] sector remains very small by comparison, at under £100 billion in assets.

Figure 1: UK financial market total assets



Note: The figure shows the distribution of total assets across banks, insurance companies, financial services firms, investment banks and brokers, real estate finance, and building societies in 2024. Source: Author's calculations based on data from BSA and Thomson Reuters Eikon Datastream.

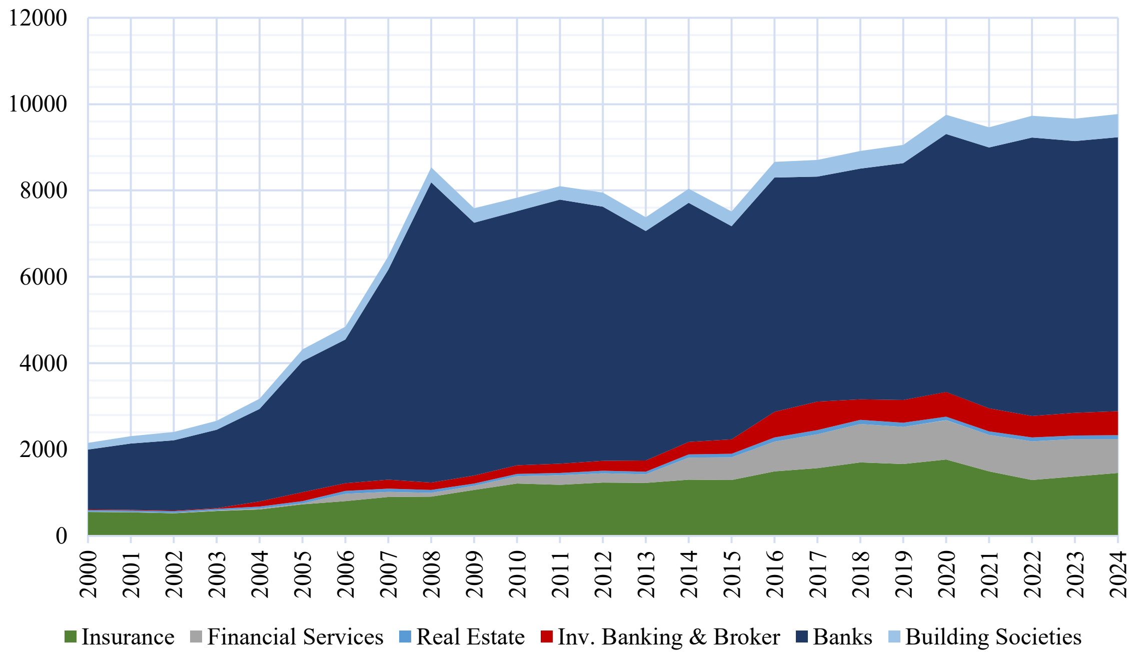
Figure 2 displays the evolution of sectoral asset shares within the UK financial system between 2000 and 2024. The trajectory highlights the steady and resilient expansion of the building societies sector over the past two decades. In 2000, building societies held around £150 billion in assets. By 2007/08, this had risen to just below £350 billion (5% of the market), and since 2022 their total assets have exceeded £500 billion. This growth contrasts sharply with the experience of banks, whose balance sheets contracted markedly following the GFC and again during the eurozone debt crisis, before stabilising at around £6 trillion. Building societies continued to expand their balance sheets, maintaining steady asset growth even through episodes of macrofinancial stress.

On average, the building societies sector recorded annual asset growth of 5.4%, with the five largest societies expanding by 7.8%. Growth was particularly strong in the pre-GFC period, reflecting robust mortgage lending and deposit accumulation, but has moderated in the past fifteen years as the sector matured and prudential regulations tightened. By contrast, large and systemic banks displayed far more pronounced cyclicality. Their balance sheets expanded rapidly in the years preceding the GFC, with growth rates exceeding 19%, but contracted sharply thereafter and again during the Eurozone crisis.

[3] The real estate sector includes only Real Estate Investment Trusts (REITs), not real estate services companies or developers.

Over the full sample, bank assets rose by 7.5%, driven largely by pre-crisis expansion, whereas post-2010 growth averaged just 0.6%.

Figure 2: Sector shares of UK financial system assets, 2000–2024



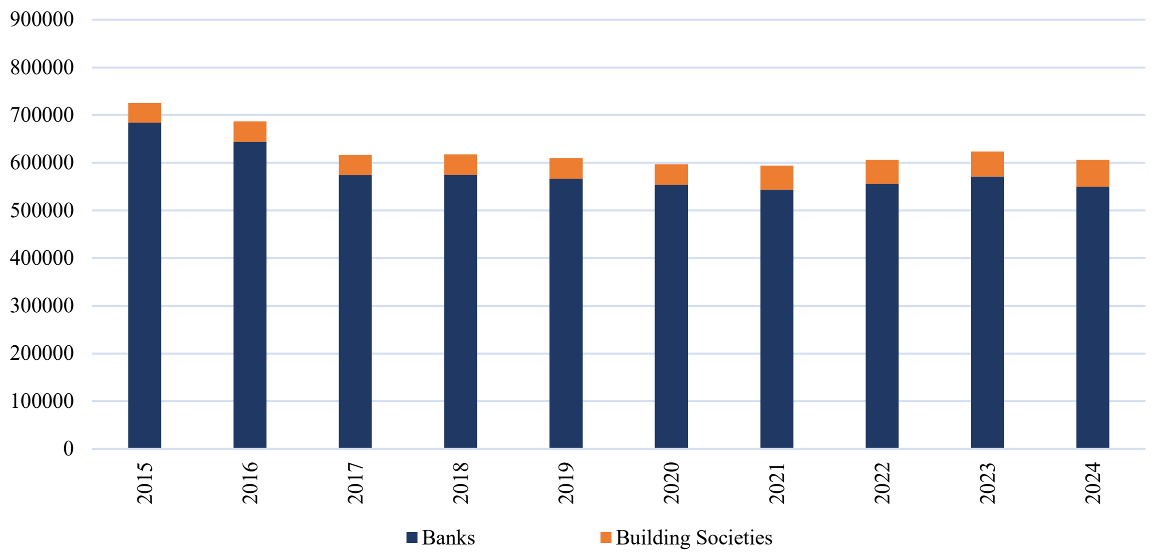
Note: The figure illustrates the evolution of each sector's share of total financial system assets between 2000 and 2024. Source: Author's calculations based on data from BSA and Thomson Reuters Eikon Datastream.

Building societies, in comparison, maintained steady positive growth even through episodes of market stress, averaging 4.7% annually since 2010. The data are consistent with the literature that although banks outperformed building societies before the crisis, the building societies sector recovered more rapidly and sustainably in its aftermath (Casu, 2015). The data also confirm that building societies exhibit more stable and less procyclical asset growth than banks. Given that rapid pre-crisis loan growth has been linked to greater post-crisis performance deterioration and risk-taking (Berger & Bouwman, 2013), the relative stability of building societies underscores their conservative risk posture and countercyclical role in credit intermediation. Overall, the pattern suggests that building societies have functioned as shock absorbers rather than amplifiers within the UK financial system.

The importance of the building societies sector within the UK financial system is also reflected in its employment footprint. The sector currently employs over 55,000 staff, with approximately 84% working in the five largest building societies. While this figure is considerably lower than the banking sector, whose total employment exceeds half a million, it nonetheless demonstrates the sector's sustained expansion and operational significance. Employment dynamics also highlight contrasting post-crisis trajectories. Prior to 2010, banks expanded their workforce by an average of 7.3% annually, compared with 2% among building societies. However, following the GFC, the banking sector experienced a 2.7% decline in headcount, whereas building societies increased employment by approximately 2.3% over the same period.

Other financial subsectors also exhibited modest but positive growth, with investment banking recording the strongest gains (7.5%). The five largest building societies displayed particularly resilient performance, with employment rising by 5.3% since 2010 and 3.8% over the full sample period.

Figure 3: Number of employees in UK banks and building societies

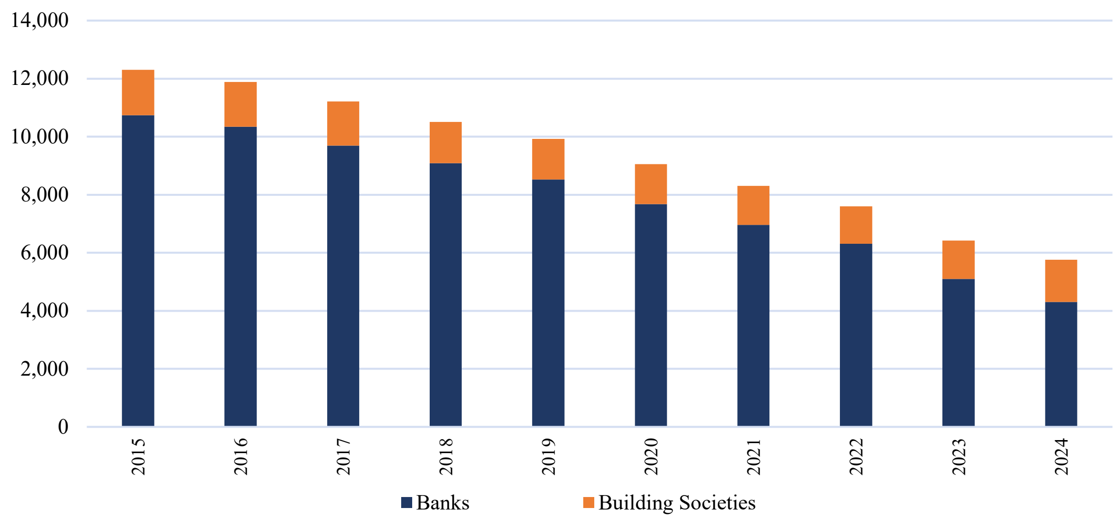


Note: The figure reports the number of employees over the same period. Bank figures include major UK banking groups, while building society data cover all active building societies. Source: BSA, Bank of England, and Statista.

A similar pattern is observed in branch networks, where the broader market trend shows a rapid reduction in physical locations in favour of digital service provision. Between 2015 and 2024, building societies reduced their branch presence by approximately 7%, compared with a 60% contraction across the banking sector. This divergence reflects both the enduring importance of in-person service provision within the mutual model and the societies' strong regional focus, which sustains local economic engagement even amid digital transformation. The data are presented in Figure 4. Building societies have continued to expand their workforce through multiple stress episodes, reflecting both their retail-focused business orientation and their limited exposure to cyclical market activities.

Beyond their physical networks presence, building societies also continue to play a pivotal role in UK mortgage lending. According to data from the BSA and the Bank of England, in 2024 building societies approved more than 412,000 mortgages, worth over £77 billion. This accounted for 32.7% of total gross lending in that year, rising to 35% in the first quarter of 2025. The sector's importance is evident in gross lending flows (Figure 5). After contracting sharply during the GFC, gross lending gradually recovered, stabilising between £4 billion and £6 billion per quarter through much of the 2010s. The COVID-19 pandemic brought temporary volatility, with sharp falls during lockdowns followed by a strong rebound in 2021. By March 2025, gross lending reached its highest level in the series, exceeding £10 billion.

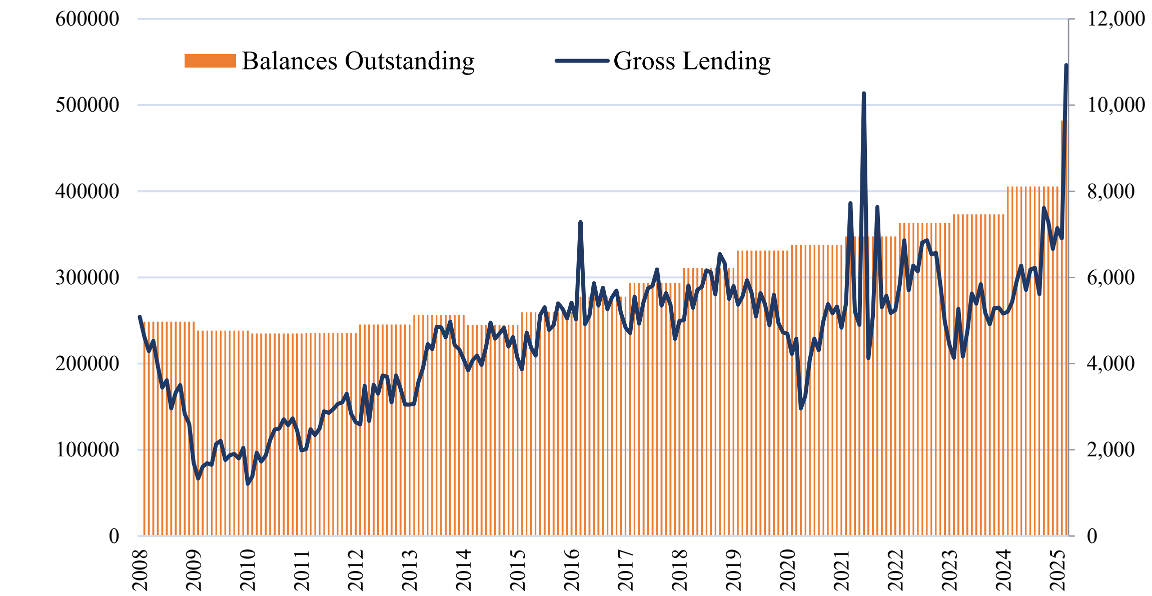
Figure 4: Number of branches in UK banks and building societies



Note: The figure shows the total number of branches operated by UK banks and building societies between 2015 and 2024. Source: BSA, Bank of England, and Statista.

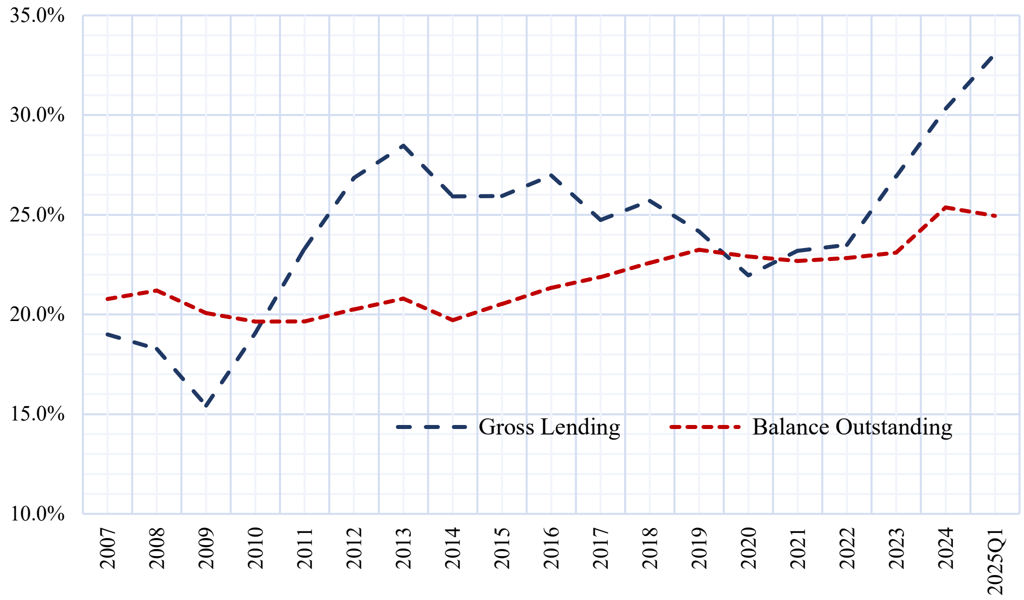
Over the period 2007 to 2025, the aggregate stock of mortgage lending by building societies more than doubled, rising from just over £200 billion to close to £500 billion. While the GFC and Eurozone debt crisis temporarily slowed growth, the longer-term trend has been one of steady expansion. Building societies consistently rebounded, with lending growth stabilising at moderate but positive rates throughout much of the 2010s.

Figure 5: Mortgage lending by building societies (£m)



Note: The bars show the total stock of outstanding mortgage lending by UK building societies, while the line shows quarterly gross mortgage lending flows over the period 2007–2025. Values are in nominal terms. Source: BSA and BoE.

Figure 6: Share of building societies in UK total mortgage lending



Note: The figure shows the share of building societies in total UK mortgage lending. The solid line represents the percentage share of gross mortgage lending by building societies, and the dashed line shows their share of total outstanding mortgage balances over time. Source: BSA, BoE, and Skouralis (2026a).

More recently, growth has accelerated sharply, with balances increasing by more than 20% in 2024–2025. This reflects both the recovery in housing demand after the pandemic and the sector's ability to compete effectively in the mortgage market despite higher interest rates. In addition, as presented in Figure 6, building societies accounted for less than 20% of the total mortgages outstanding in the UK in 2007, however their share gradually increased to 23% in 2019 and 25.4% in 2024. Alongside their lending activities, building societies are also major deposit-takers. They accounted for almost one-fifth (19.9%) of UK retail savings deposits in 2024, a share that increased to 23% in the first quarter of 2025. Their contribution to household finance and financial inclusion is therefore substantial, underscoring their long-run ability to expand lending capacity while maintaining balance-sheet stability.

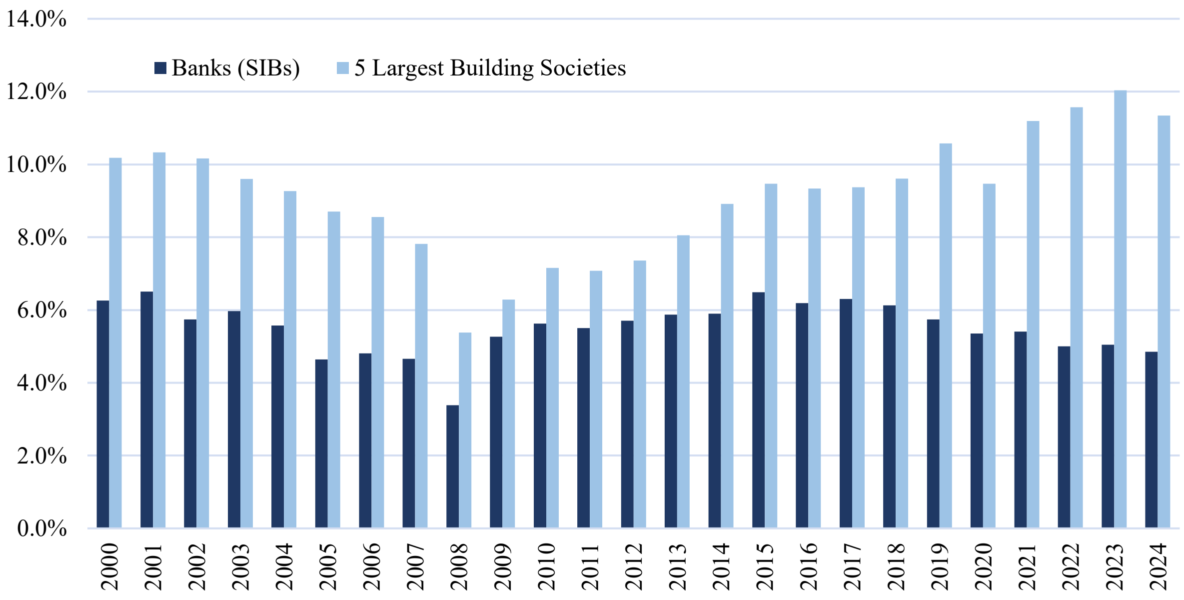
3. Evaluating the stability of the building societies sector

3.1 Capitalisation and profitability

Capitalisation is a key determinant of institutional resilience and an essential component of balance-sheet stability. Figure 7 illustrates the evolution of equity-to-assets ratios for the five largest UK building societies and the five systemically important banks (SIBs) between 2000 and 2024. The results show a persistent and widening gap in capital strength between the two groups. Building societies consistently maintain higher equity ratios, averaging around 9% across the sample period, compared with roughly 5 to 6% for banks. This differential highlights the structurally more conservative balance-sheet strategies of building societies, which rely primarily on retained earnings and deposit funding rather than wholesale-market funding. The period around the GFC marks a clear turning point.

Both groups experienced temporary declines in 2008–2009, but the magnitude of the fall was far greater for systemic banks, whose equity ratio dropped below 4%, while building societies remained above 5%. Since then, capitalisation within the sector has strengthened steadily. The equity ratio of the top five building societies rose from 7.2% in 2010 and has been close to or above 10% since 2015, whereas banks' ratios have stagnated near 5%. This divergence is consistent with the differential risk appetites of the two business models and with evidence that building societies tend to maintain stronger solvency buffers under stress. The persistent capital advantage also reflects post-crisis regulatory developments. By contrast, large banks' capital trajectories remain shaped by more complex balance sheets and cyclical adjustments in risk-weighted assets.

Figure 7: Equity-to-assets ratio for UK banks and building societies



Note: The figure compares the equity-to-assets ratio of the five largest UK banks (classified as SIBs) with that of the five largest building societies over the period 2000–2024. The equity-to-assets ratio is calculated as total equity divided by total assets. Source: Author's calculations based on Thomson Reuters Eikon Datastream and BSA data.

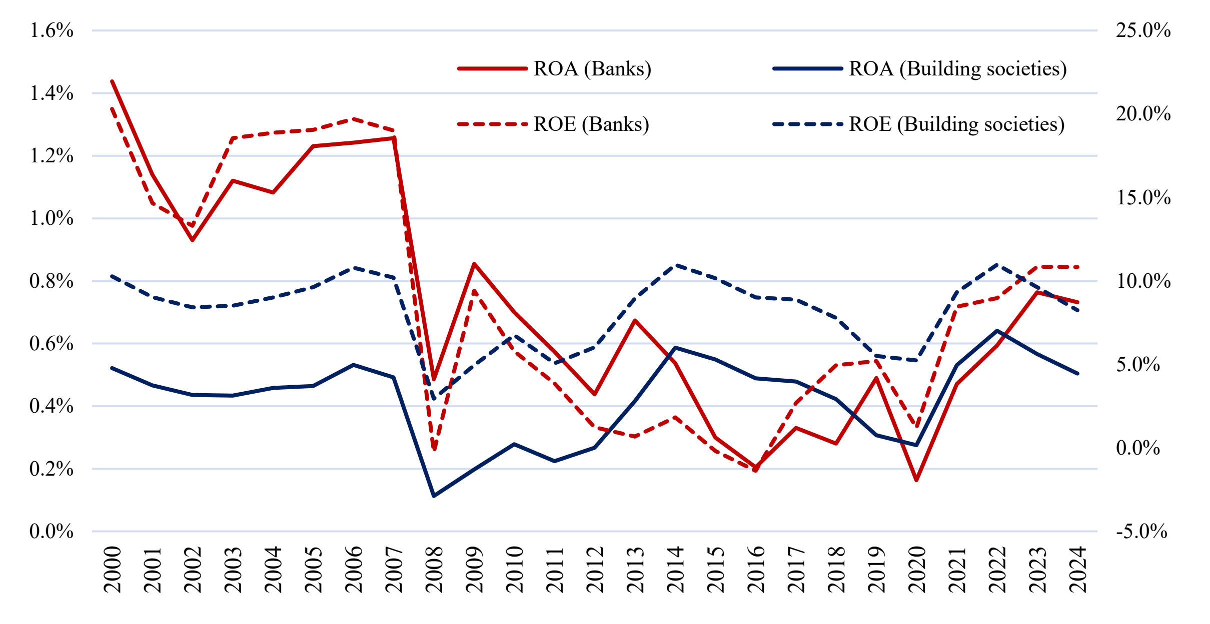
Figure 8 plots sector-level profitability, measured by return on assets (ROA) and return on equity (ROE), for the five largest UK banks and the five largest building societies from 2000 to 2024. Throughout most of the pre-crisis period (2000–2007), banks reported higher profitability than building societies. Their average ROA exceeded 1%, while ROE frequently reached 18%, supported by balance-sheet expansion, wholesale funding, and fee-based income from investment banking and trading activities. In contrast, building societies generated modest but stable returns, with ROA typically around 0.5% and ROE just below 10%. This lower profitability is consistent with expectations and reflects their mutual ownership structure and policy of profit reinvestment rather than distribution, as well as their focus on retail deposit funding and prime mortgage lending. However, in the aftermath of the GFC, banks experienced a dramatic collapse in profitability, with average ROE turning sharply negative and ROA falling to 0.5%.

This was driven by extensive credit losses, mark-to-market writedowns, and a rapid contraction in equity values, most notably for NatWest (then RBS), which generated negative average ROE even when asset-level returns remained marginally positive. Building societies, in contrast, weathered the downturn with smaller declines: their ROA remained at similar levels, and ROE fell only moderately to around 7.7%, reflecting conservative lending standards, limited exposure to wholesale markets, and relatively high pre-crisis capital buffers.

Post-crisis profitability dynamics reveal a clear divergence between banks and building societies. Banks' profitability rebounded after the GFC but remained highly cyclical, with elevated volatility driven by restructuring costs, conduct fines, and evolving regulatory capital requirements. Building societies, by contrast, recovered to pre-crisis profitability levels by 2012 and have since maintained a stable earnings profile. This difference is reflected in earnings volatility.

The standard deviation of ROA is 0.37% for UK systemic banks, nearly three times higher than that of the five largest building societies (0.13%). When the full population of banks and building societies is considered, the gap widens further: 0.95% for all banks versus 0.12% for all building societies. Over the past three years, there has been a gradual convergence in profitability, with the average ROE estimated at 10.2% for banks and 9.6% for building societies.

Figure 8: Profitability ratios of UK banks and building societies



Note: This figure reports the average ROA (left axis, solid lines) and ROE (right axis, dashed lines) for UK banks and building societies over the period 2000–2024. ROA is defined as net income over total assets, and ROE as net income over total equity. Bank figures are based on the five UK systemic banks, while building society figures are based on the five largest building societies. Building society data are constructed from BSA records and supplemented with manually collected information from annual reports. All financial statement data for banks are obtained from Thomson Reuters Eikon Datastream. Values represent annual averages.

Overall, the evidence indicates that while banks earn higher returns during expansion periods, their profitability is substantially more volatile and sensitive to financial cycles, thereby increasing their contribution to systemic risk. Building societies, in contrast, follow a low-risk, lower-return model with smoother earnings and resilience under stress, consistent with their role as countercyclical stabilisers in the UK financial system.

3.2 Z-score: A measure of stability and idiosyncratic risk

Building on the analysis of profitability and capitalisation, this section assesses the overall financial stability of the building societies sector in comparison to UK banks and other listed financial institutions. To do so, we employ the Z-score, an accounting-based measure of insolvency risk that captures the distance to default based on earnings strength, capital buffers, and earnings volatility.

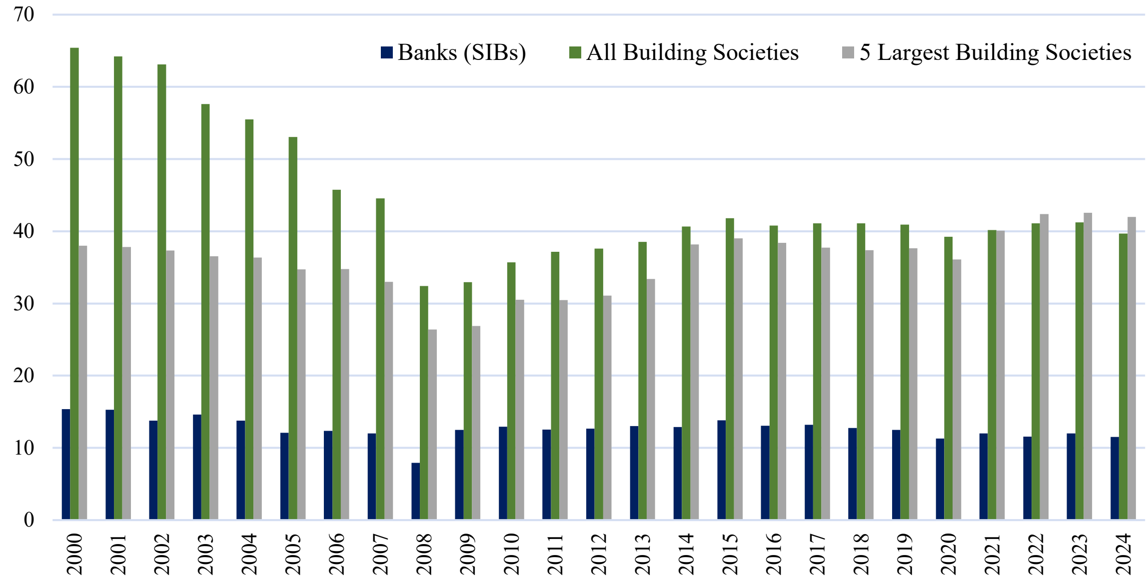
The Z-score is defined as:

$$Z - score\ = \frac{ROA + Equity/Assets}{std(ROA)} \tag{1}$$

Intuitively, the Z-score measures the number of standard deviations by which returns would have to fall before equity is exhausted. A higher Z-score therefore implies lower default risk and greater resilience. This measure has been extensively used in the literature to compare the stability of banks and mutual institutions (Laeven & Levine, 2009; Hesse & Čihák, 2007; Casu, 2015; Goddard et al., 2008; McKillop et al., 2020). The Z-score provides a useful complement to market-based systemic risk metrics because it captures idiosyncratic solvency risk derived from observed profitability and capital buffers, rather than from market valuations. Figure 9 shows the average firm-level estimates for UK banks and building societies over 2000–2024. The results confirm a persistent and pronounced stability gap between the two sectors. The five largest building societies display average Z-scores of around 36, compared with 10–15 for the five UK systemic banks. This indicates that earnings of building societies would need to fall several times more than those of banks before capital buffers are exhausted, implying substantially lower insolvency risk. The gap narrows slightly during the GFC, reflecting system-wide stress, but building societies recover quickly and their solvency buffer widens again from 2013 onwards. By contrast, banks' Z-scores remain relatively flat and structurally lower, consistent with greater leverage, higher earnings volatility, and exposure to wholesale funding markets.

The analysis also reveals important within-sector heterogeneity. The average firm-level Z-score for the full population of building societies is just above 44, while the top five institutions average 36. This reflects a scale-prudence trade-off: larger societies benefit from diversification and stronger revenue capacity but operate with slightly higher leverage and narrower capital margins than smaller peers. When inactive (exited) building societies are excluded, the average Z-score falls to 40.7. Although initially counterintuitive, this reflects a survivorship effect. Many of the institutions that later exited did not do so due to distress, but rather through consolidation or merger, and thus did not experience significant solvency erosion before exit. By 2009, 60% of inactive societies had already left the market, rising to 84% by 2012. This pattern is consistent with recent evidence on survivorship and delisting bias in systemic risk estimation (Skouralis, 2026b).

Figure 9: Z-score for UK banks and building societies



Note: The figure shows the average Z-score values for three groups over the period 2000–2024: (i) the five largest UK SIBs, (ii) all active building societies, and (iii) the five largest building societies. Z-scores are calculated using the equity-to-assets ratio, ROA, and the standard deviation of ROA over time. Higher Z-scores indicate lower insolvency risk. Source: Author's calculations based on BSA and Thomson Reuters Eikon Datastream data.

Our findings closely match those reported in Casu (2015), who finds that UK building societies consistently exhibited higher mean Z-scores than commercial banks between 2005 and 2014. Similarly, Hesse and Čihák (2007) and Ayadi et al. (2009) document that cooperative and mutual banking institutions exhibit greater stability due to conservative business models, stable deposit funding, and limited involvement in speculative activities. The relatively lower Z-scores of larger societies in our sample are also consistent with Goddard et al. (2008) and McKillop et al. (2020), who observe that growth and expansion can modestly reduce solvency buffers without undermining sectoral soundness. These results confirm that building societies exhibit strong and persistent solvency resilience, with size-related differences that align closely with established evidence on mutual and cooperative banking models.

4. Systemic risk analysis

This section extends the analysis by quantifying systemic risk and systemic exposure within the building societies sector. We use three complementary measures. First, we employ the LOO Z-score, which assesses each institution's marginal contribution to sector stability by measuring how its removal affects the aggregate Z-score. Second, we use SRISK to estimate each institution's systemic importance by quantifying its expected capital shortfall under a severe market stress scenario. SRISK is estimated indirectly following Engle et al. (2024) and Skouralis (2026a), using a set of observable firm-level balance-sheet characteristics in place of market data. Third, we use an asset growth-based Exposure–ΔCoVaR approach to evaluate the sensitivity of building societies to system-wide distress by measuring the extent to which their risk increases when the broader financial system experiences a tail event. These metrics provide a comprehensive assessment of whether building societies act as stabilisers or potential amplifiers of systemic risk, both individually and in aggregate, and enable a systematic evaluation of the sector's resilience to systemic shocks.

4.1 Z-score as a measure of systemic importance

While the standard Z-score measures the standalone financial soundness of an institution, it does not capture how each entity contributes to system-wide stability. To address this limitation, we employ the LOO Z-score approach proposed by Li et al. (2020). This method provides an accounting-based measure of systemic risk contribution that can be applied even to unlisted institutions such as building societies. The LOO Z-score quantifies an institution's systemic risk contribution as the difference between the aggregate Z-score of the system (including all financial institutions) and the Z-score of the financial system when one institution is excluded.

The mathematical representation is as follows:

$$Z - Systemic\ Contribution_i = \frac{Z\text{−}score^{-i}\ -\ Z\text{−}score^{ALL}}{Z\text{−}score^{ALL}} \tag{2}$$

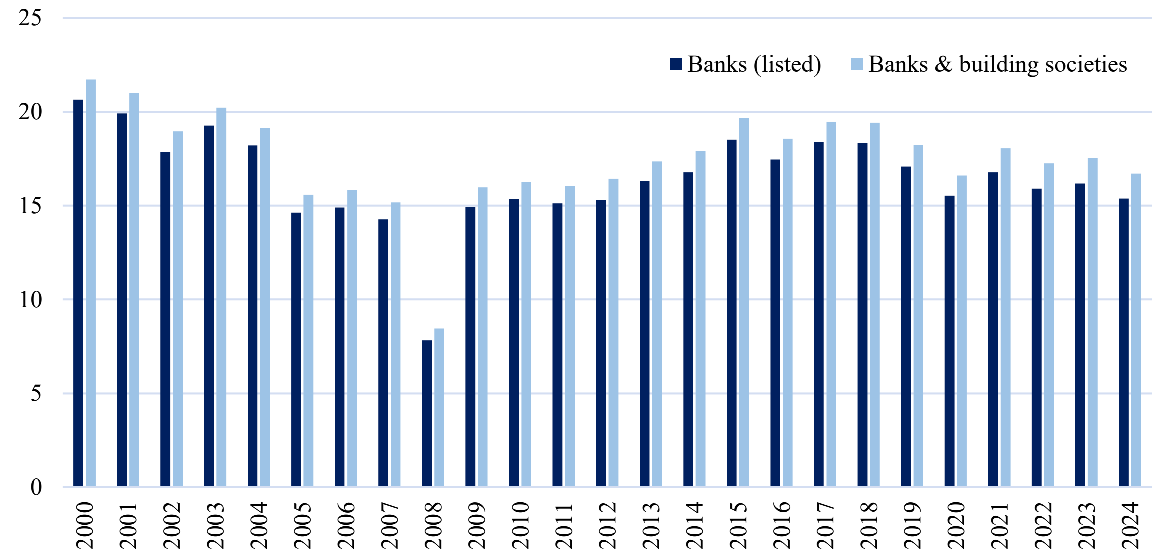
where $Z - score^{ALL}$ denotes the aggregate Z-score of the entire market (banks and building societies), and $Z - score^{-i}$ denotes the Z-score of the same portfolio excluding institution *i*. A negative difference indicates that the system becomes more risky when a particular institution or sector is excluded, signalling a stabilising contribution. Conversely, a positive difference suggests that $Z - score^{-i}$ is greater than $Z - score^{ALL}$, and thus removing the institution or sector improves system resilience, implying that it is a net contributor to systemic risk. This approach aligns with portfolio theory: removing a highly diversified and stable institution (e.g. a large mutual) should reduce overall system diversification and increase aggregate risk, while removing a riskier, more volatile entity (e.g. a large complex bank) may enhance system stability. Importantly, this method is based purely on accounting data and thus can be used for non-listed companies.

Therefore, following Li et al. (2020), we compute the LOO Z-score where the aggregate values are obtained by weighting individual institutions' profits, equity, and assets by their total asset shares. We then sequentially exclude one institution or groups of institutions at a time and recompute $Z - score^{-i}$. The difference between the full-system $Z - score^{ALL}$ and the $Z - score^{-i}$ represents that institution or sector's marginal systemic impact. This method has three major advantages. First, it allows the systemic assessment of unlisted institutions such as building societies. Second, it is consistent with prudential regulation – systemically important institutions are expected to hold higher capital buffers. Third, it provides a useful complement to market-based measures by focusing on solvency and earnings-based fundamentals rather than market valuations. Empirically, Li et al. (2020) show that the LOO Z-score correctly identifies the four systemically important New Zealand banks designated by the RBNZ, confirming the method's reliability and regulatory relevance.

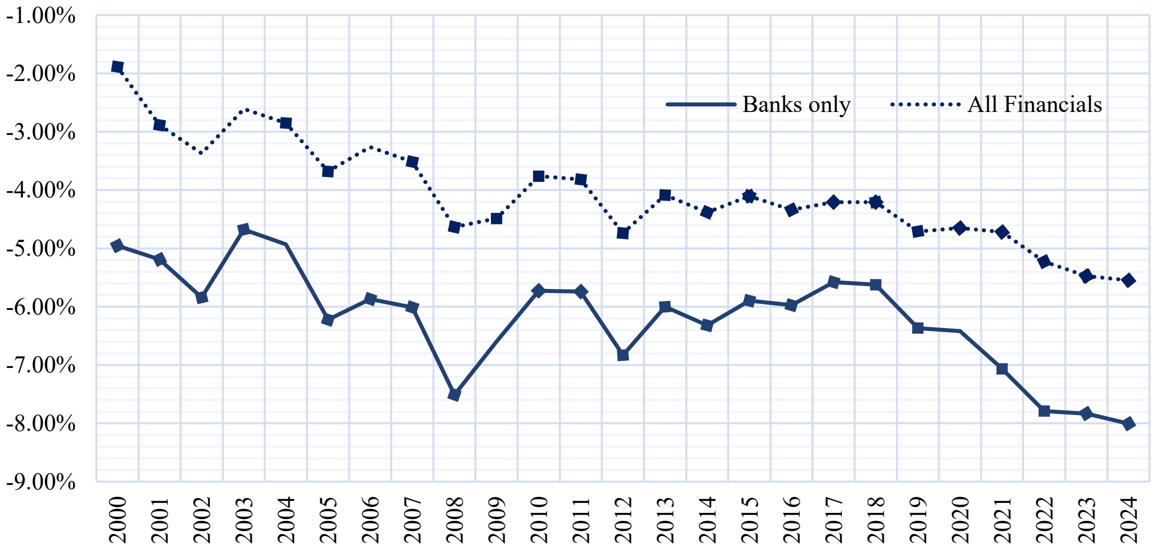
Applied to the UK context, it enables the assessment of building societies and smaller lenders that are otherwise omitted from market-based systemic risk frameworks.

Figure 10: Impact of including building societies on system-wide stability

A. Z-score comparison



B. Percentage difference



Note: Panel A compares the aggregate Z-score of the UK financial system when calculated using only listed banks with the aggregate Z-score when building societies are included in the sample. Panel B shows the percentage difference between the two Z-scores over time. Source: Author's calculations based on BSA data and Thomson Reuters Eikon Datastream.

To assess how building societies contribute to the overall resilience of the UK financial system, we begin by comparing the Z-score for listed banks with that obtained when building societies are also included in the sample. Figure 10.A presents the evolution of the two aggregate Z-scores over the period 2000–2024. The results reveal a persistent stability gap between the two series. The inclusion of building societies significantly raises the aggregate Z-score, indicating that the sector materially enhances the solvency and resilience of the UK banking system. The difference is particularly pronounced during the GFC, when building societies' conservative lending practices, strong capitalisation, and reliance on retail deposits helped to cushion the overall decline in system stability. From 2018 onwards, the gap widens steadily, reflecting the continued strengthening of the sector under tighter prudential standards and its limited exposure to market-based and cyclical activities.

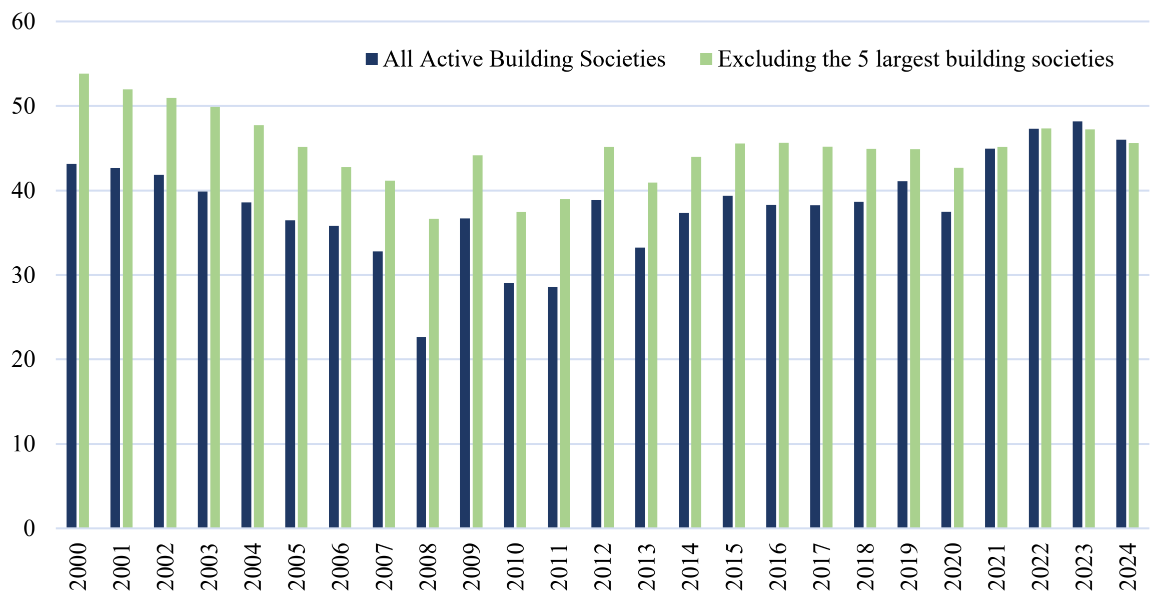
Figure 10.B better illustrates this stabilising effect, showing that the exclusion of building societies decreases the system-wide Z-score by roughly 2–5% in most years. The effect is strongest for the banking sector, suggesting that building societies play a particularly important countercyclical role relative to listed banks. As a robustness check, the dotted line in Figure 10.B also shows the corresponding percentage difference when extending the sample to all listed financial institutions. The trend remains positive and broadly similar, though slightly attenuated, confirming that the stabilising contribution of building societies is not driven by sample composition. Overall, the evidence highlights that building societies act as a stabilising force within UK financial markets.

In addition, to assess whether the largest building societies drive the resilience of the sector or instead contribute to its systemic vulnerability, Figure 11.A compares the aggregate Z-score of all active building societies with that obtained when the five largest societies are excluded. Figure 11.B shows the percentage difference between the two series. The results reveal that the aggregate Z-score increases once the largest five societies are removed, indicating that these institutions exert a negative pull on the sector's overall stability measure. In other words, the smaller and mid-sized societies appear, on average, to operate with more conservative balance sheets and greater solvency buffers relative to their risk exposure. The difference is sizeable and persistent: excluding the top five increases the sector's Z-score by roughly 15–25% across most of the sample period, with the gap widening during and after the GFC. This pattern suggests that the largest building societies, while individually well capitalised, take on more complex portfolios and engage in business models closer to those of commercial banks, reducing their relative risk-adjusted stability. The gap narrows somewhat after 2015, consistent with the sector's post-crisis consolidation and regulatory tightening.

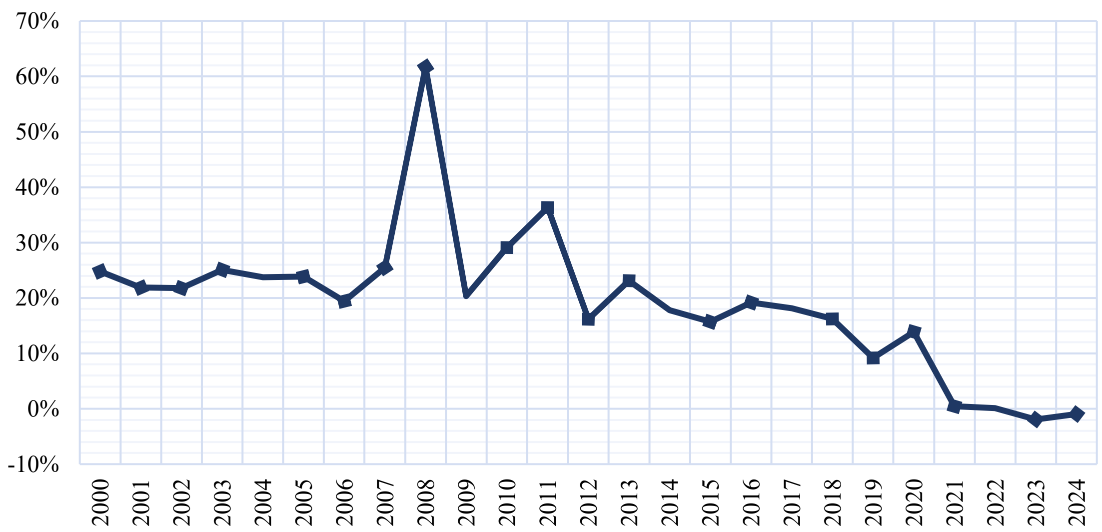
Overall, these findings imply that the systemic importance of the five largest building societies is associated with higher relative risk, and that the smaller institutions contribute disproportionately to the sector's aggregate resilience. This asymmetry highlights the importance of monitoring concentration risk within the building societies sector, as the behaviour of its largest members has the potential to influence system-wide solvency dynamics. From a policy standpoint, the LOO Z-score analysis underscores the structural stabilising role of building societies within the UK's financial system. While the sector as a whole acts as a structural stabiliser, the results reveal that this resilience is not evenly distributed. Excluding the five largest societies increases the sector's Z-score, implying that the stability contribution is disproportionately driven by smaller and mid-sized building societies. In other words, the largest building societies exhibit risk characteristics more akin to commercial banks, reflecting their scale, product diversification, and greater exposure to competitive mortgage markets.

Figure 11: Contribution of the largest building societies to sector stability

A. Z-score comparison



B. Percentage difference



Note: Panel A compares the aggregate Z-score for all active building societies, with the aggregate Z-score calculated after excluding the five largest building societies. Panel B shows the percentage difference between the two series over time. Source: Author's calculations based on BSA data and Thomson Reuters Eikon Datastream.

These findings carry important implications for prudential policy. They provide empirical support for maintaining a proportionate regulatory framework, which recognises the structural resilience and limited systemic footprint of smaller mutual institutions and the need for differentiated supervisory attention towards the largest building societies. More broadly, the findings also reinforce the value of institutional diversity within the financial ecosystem. A system dominated by large, complex banks (or a few large mutuals) would be more homogeneous and therefore more vulnerable to systemic stress. The coexistence of smaller, member-owned institutions introduces heterogeneity in business models, funding structures, and risk appetites, which collectively enhance the system's capacity to absorb shocks. As macroprudential policy evolves to address new sources of risk, such as climate-related exposures, housing market volatility, and digital transformation, preserving the viability of smaller, community-oriented building societies should remain a priority. Their demonstrated resilience and countercyclical behaviour make them an essential component of the UK's financial stability architecture.

4.2 SRISK

A wide variety of approaches have been proposed to quantify systemic risk, reflecting the fact that financial instability can emerge through multiple channels, from interconnected balance sheets to market co-movements, to funding fragilities. Among these, one of the measures that has gained particular attention in both academic research and policy discussions is SRISK, developed by Brownlees and Engle (2017). SRISK is a forward-looking, capital-based measure that estimates the expected equity shortfall of an institution in the event of a severe market downturn. Its methodology is based on both market and balance-sheet data (liabilities and equity) and quantifies how much additional capital a firm would need to remain solvent in a systemic crisis. This makes SRISK especially attractive for regulators, since it connects directly to prudential capital requirements and has been applied extensively in stress-testing and policy work (Engle et al., 2015; Benoit et al., 2017).

SRISK is designed to quantify the capital shortfall an institution would face in the event of a large market downturn. A systemic crisis is most damaging when large and highly leveraged institutions experience severe equity losses, leaving them unable to satisfy regulatory capital requirements. Therefore, SRISK estimates the additional equity an institution would need to restore its solvency under such conditions. In practical terms, SRISK combines three elements: the size of equity, the level of debt, and the sensitivity of stock returns to market-wide downturns. The measure compares the minimum equity buffer implied by prudential regulation with the equity that would remain after a market fall of, typically, 40% over a six-month horizon. The difference represents the institution's expected capital shortfall. One of the strengths of SRISK is that it can be aggregated across firms to yield a system-wide measure, making it especially useful for macroprudential monitoring and cross-country comparison. However, it is important to note that the measure is inherently designed for banks, where the relationship between liabilities, equity, and regulatory capital is more transparent and well defined. The mathematical representation of SRISK is as follows for company i at time t:

$$SRISK_{i,t} = k \times \left(Liabilities_{i,t} + Market\ Cap_{i,t}\right) - (1 - LRMES_{i,t}) \times Market\ Cap_{i,t} \tag{3}$$

where k represents the prudential capital requirement (commonly set at 8%) and the $LRMES_{i,t}$ is the long-run marginal expected shortfall that captures the percentage decline in firm i's equity that would be expected if the overall market were to fall sharply (typically by 40% over a six-month horizon). In the estimation of SRISK, the first component $k \times \left(Liabilities_{i,t} + Market\ Cap_{i,t}\right)$ reflects the minimum equity buffer required by regulation. The second part of the equation, $\left(1 - LRMES_{i,t}\right) \times Market\ Cap_{i,t}$, represents the equity value projected to survive such a downturn. The gap between these two quantities defines the shortfall, i.e. the amount of additional equity the institution would need to remain solvent under the stress scenario.

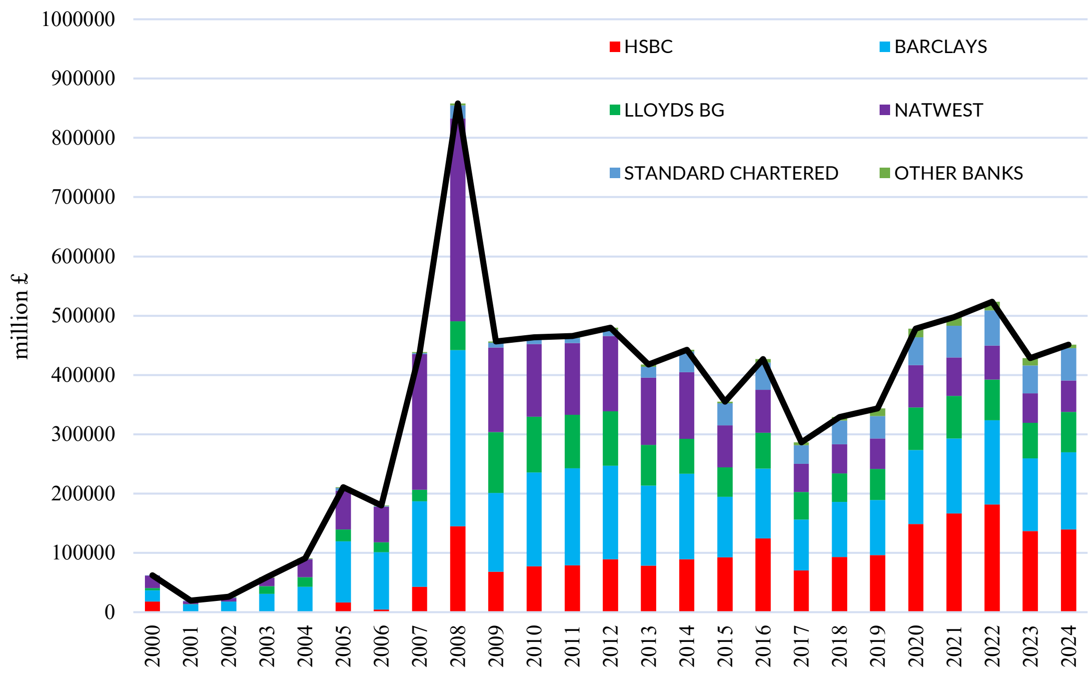
The main limitation of market-based metrics, such as SRISK, is that they require equity price and volatility data. These are unavailable for non-listed companies and mutual institutions such as building societies. To address this gap, we adopt an indirect mapping approach. More specifically, we estimate the relationship between systemic risk measures employing a sample of listed banks and a set of fundamental balance-sheet variables, and then use these mappings to predict systemic risk for non-listed institutions. This strategy closely follows recent advances in the literature (Engle et al., 2024 Skouralis, 2026a), where accounting fundamentals are used to extrapolate systemic risk contributions beyond listed firms.

The approach offers two key advantages. First, it extends the systemic risk perimeter to include non-listed financial institutions, and second, it permits direct comparison between listed and non-listed institutions within a coherent empirical framework. For our analysis, we use data on total liabilities, market capitalisation and stock market returns from Thomson Reuters Eikon Datastream. For the estimation of LRMES we use adjusted stock returns of the examined bank, and for the system index we construct a market capitalisation weighted portfolio of a wide range of financial institutions including retail and investment banks, insurance companies, financial services companies, and REITs. The sample includes both active and delisted companies.

Figure 12 presents our estimates and depicts the evolution of systemic risk contributions (SRISK) among major UK banks from 2000 to 2024. The dynamics closely mirror key episodes of financial stress, regulatory adjustment, and balance-sheet restructuring within the UK financial system. More specifically, SRISK levels rise gradually from the early 2000s, reflecting balance-sheet expansion and increasing leverage ahead of the GFC. The measure peaks sharply in 2008–2009, exceeding £850 billion on aggregate (the highest level in the sample), driven predominantly by NatWest (formerly RBS), Barclays, and Lloyds Banking Group. NatWest alone accounts for the largest share of the system-wide shortfall, consistent with its pre-crisis balance-sheet size, heavy exposure to wholesale funding, and subsequent government intervention. This period marks the point of greatest systemic vulnerability, with simultaneous declines in equity values and high leverage significantly weakening capital buffers.

After 2010, aggregate SRISK contracts markedly and remains relatively stable throughout the 2010s. This reflects the combined effect of Basel III implementation, balance-sheet deleveraging, ring-fencing reforms, and a structural shift toward more retail-oriented funding models. The composition of systemic risk also changes substantially: HSBC and Barclays emerge as the two dominant contributors, together representing more than half of system-wide SRISK in most post-crisis years. Their global operations and capital market exposures make them the core nodes of systemic interdependence. In contrast, Lloyds and NatWest sharply reduce their systemic footprint following extensive restructuring, asset sales, and reorientation toward domestic retail banking. Standard Chartered and other smaller institutions contribute only marginally, underscoring their limited domestic contagion potential.

Figure 12: Decomposition of SRISK for major UK banks



Note: The figure shows the evolution of SRISK contributions for major UK banks over the period 2000–2024. SRISK is measured as the expected capital shortfall of each institution in a systemic crisis scenario. The stacked areas show the contribution of each bank to total system-wide SRISK in each year. Source: Author's calculations based on Thomson Reuters Eikon Datastream data.

A modest resurgence in SRISK occurs in 2020–2021, coinciding with the COVID-19 shock. Increased market volatility and collapsing valuations temporarily raise systemic risk estimates, though the magnitude remains far below pre-GFC levels. This resilience highlights the effectiveness of post-crisis prudential reforms: higher capital buffers, improved liquidity management, and more conservative leverage ratios prevented large-scale capital shortfalls even during extreme uncertainty. By 2024, aggregate SRISK stabilises at approximately half its pre-crisis peak. The persistence of non-negligible SRISK contributions from HSBC and Barclays illustrates that systemic risk remains concentrated rather than eliminated, with a few large, globally active banks continuing to dominate the UK banking system's vulnerability profile. These results provide a benchmark for assessing the relative systemic footprint of the building societies sector in the following analysis. Having obtained the estimates of SRISK for the UK banking sector, we run the following regression model to identify the balance-sheet characteristics that best explain the variation of systemic risk over time:

$$lnSRISK_{i,t} = \alpha_i + \beta_i \times Balance\ Sheet\ Characteristcs_{i,t} + \varepsilon_{i,t} \tag{4}$$

The dependent variable is the natural logarithm of SRISK, estimated for a panel of UK banks (both active and delisted) over the period 2000–2024. This design mitigates survivorship bias and captures the evolution of systemic risk across the financial cycle. The explanatory variables, consistent with the literature (Engle et al., 2024; Skouralis, 2026a), aim to capture firm size, capitalisation, profitability, and liquidity. Table 1 reports the empirical specifications used to identify the best predictors of SRISK along with the forecast evaluation criteria. Model performance is assessed using the Mean Absolute Error (MAE) and the Root Mean Squared Error (RMSE), where higher values indicate greater forecast errors and hence lower predictive accuracy. The benchmark model achieves the best out-of-sample performance based on these criteria and includes three key firm-level predictors.

First, firm size (log assets) exhibits a positive and statistically significant relationship with SRISK, confirming that larger institutions are more systemically important. The results are consistent with the *too-big-to-fail* hypothesis and prior evidence that SRISK rises non-linearly with balance-sheet size and market interconnectedness (Brownlees & Engle, 2017; Engle et al., 2015; Laeven et al., 2016; Varotto & Zhao, 2018). Second, the results suggest that capitalisation (equity ratio) is negatively associated with SRISK, in line with Basel III principles and evidence that stronger capital buffers absorb shocks and reduce systemic externalities. The literature also suggests that leverage shows a strong positive association with SRISK, consistent with studies linking high leverage to greater amplification of losses and capital shortfalls during crises (Adrian & Brunnermeier, 2016; Laeven et al., 2016; Kladakis & Skouralis, 2024). Third, profitability (ROE) is negatively associated with SRISK, reflecting the role of retained earnings in strengthening capital resilience and reducing external funding dependence (Davydov et al., 2021; Kladakis & Skouralis, 2026).

Table 1: Out-of-sample forecast comparison (SRISK prediction)

Models	Specification	MAE	RMSE
1	Total assets, Equity ratio, ROE	1.05	1.31
2	Total assets (t-1), Equity ratio (t-1), ROE (t-1)	2.47	2.94
3	Total assets, Equity ratio, ROE, Cash/assets	1.22	1.45
4	Total assets, Equity ratio, ROA	1.20	1.53
5	Total assets, Equity ratio, Net Interest Margin (NIM)	1.18	1.36
6	Total assets, Equity ratio, ROE, Debt/assets	1.37	1.60
7	Total assets, Equity ratio, ROE, Debt/equity	1.08	1.34
8	Total assets, Equity ratio, ROE, Employees	1.15	1.59

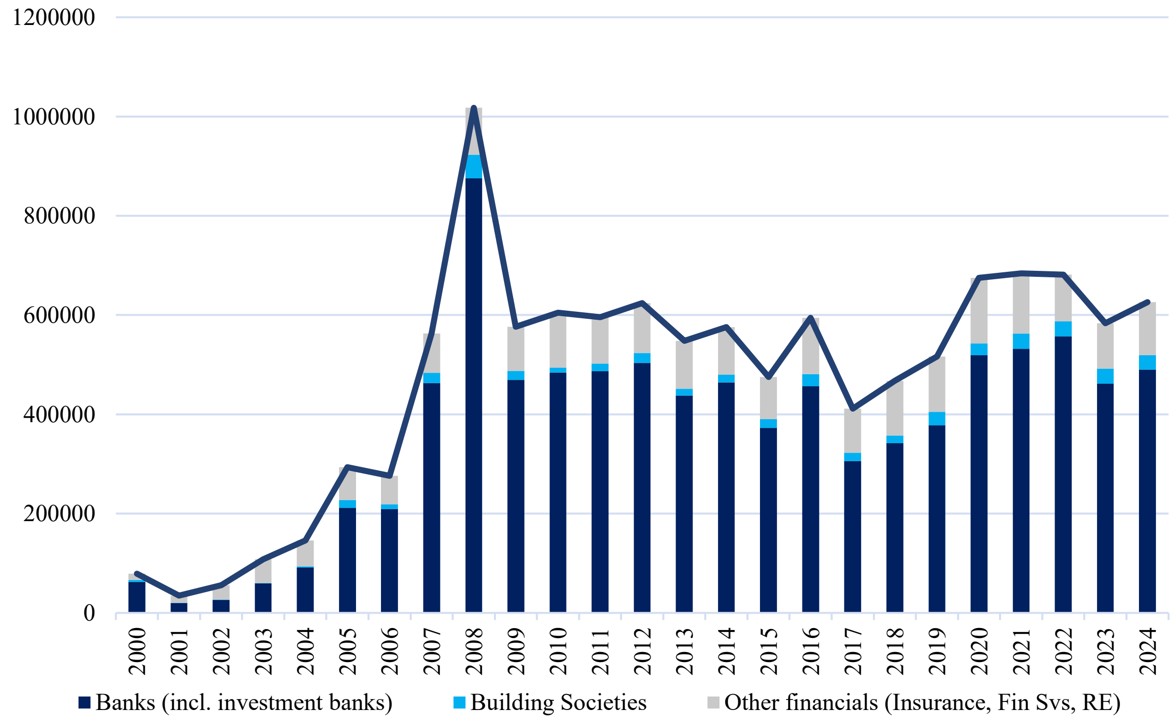
Note: This table reports out-of-sample forecast accuracy for alternative model specifications predicting the logarithm of SRISK. Forecast performance is evaluated using the MAE and RMSE, where lower values indicate better predictive performance. Model (1) is the benchmark model specification. All models are estimated over the training period (year ≤ 2021) and evaluated on the test period (year ≥ 2022) using random-effects GLS.

Finally, year fixed effects are included in all specifications to capture time-varying macrofinancial conditions, such as changes in global risk sentiment, regulatory reforms, and exogenous shocks (e.g. the COVID-19 pandemic). Additional variables, including liquidity (cash and equivalents over total assets), leverage measures (debt, debt-to-assets, debt-to-equity), alternative profitability indicators (ROA, NIM), and firm size proxies such as number of employees, were tested in alternative model specifications. However, as shown in Table 1, these extensions yielded higher MAE and RMSE values and were therefore excluded from the benchmark model. The lagged specification captures the persistence of systemic risk dynamics and provides a robust basis for extending the analysis to non-listed institutions. However, the results suggest that it exhibits lower predictive power than the contemporaneous benchmark specification. Overall, the regression analysis shows that systemic risk among UK banks is strongly driven by balance-sheet fundamentals, consistent with structural determinants identified in the literature. These coefficient estimates are then used to infer implied SRISK for the UK building societies sector, allowing a system-wide assessment of financial stability beyond the listed universe. As shown in Equation (5), SRISK for non-listed institutions is estimated indirectly using the coefficients obtained from the regression model in Equation (4).

$$non - listed\ lnSRISK_{i,t} = \ \hat{\alpha}_i + \hat{\beta}_i \times \ Balance\ Sheet\ Characteristcs_{i,t} \qquad (5)$$

Figure 13 presents the aggregate SRISK of the UK financial system, decomposed by sectors. The results confirm that systemic risk remains overwhelmingly concentrated in the banking sector, which accounts for 75% of the total capital shortfall throughout the sample.

Figure 13: SRISK decomposition across UK financial sectors



Note: The figure shows the aggregate SRISK for the UK financial system over the period 2000–2024, decomposed by sector. Sectors include banks, building societies, insurance companies, financial services firms, and real estate-related financial institutions. SRISK measures the expected capital shortfall of each sector under a systemic stress scenario. Source: Author's calculations based on BSA and Thomson Reuters Eikon Datastream data.

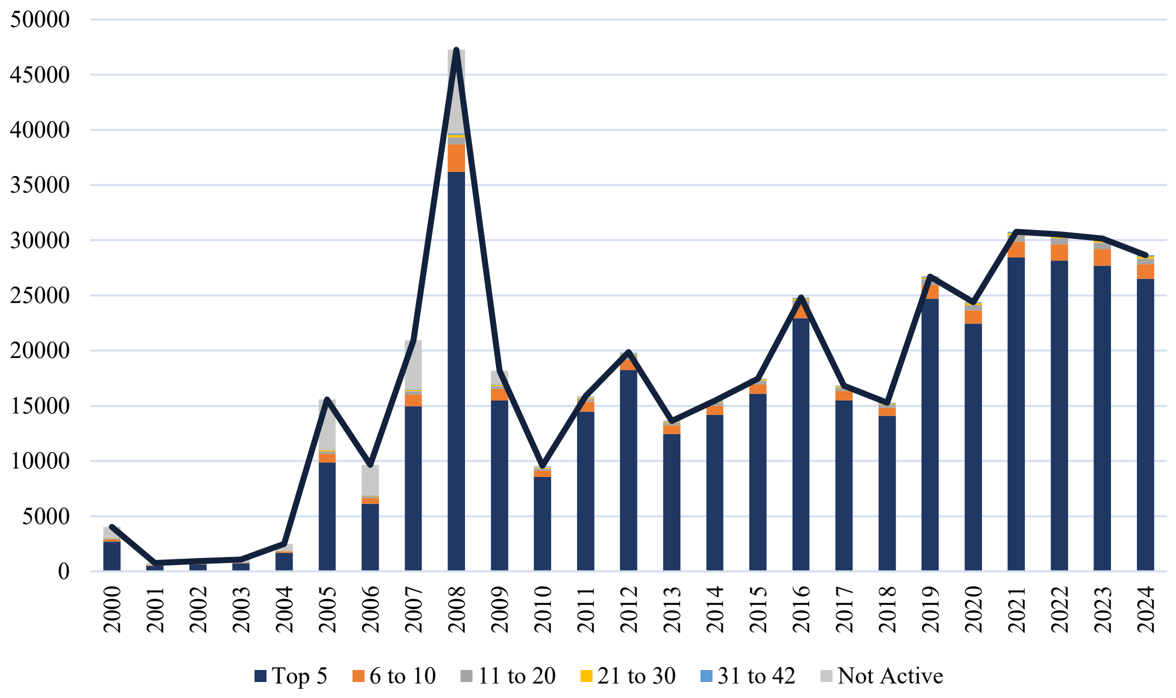
SRISK escalates sharply in the years preceding the GFC, peaking in 2008, reflecting the highly leveraged balance sheets and rapid credit expansion of major UK banks during that period. The crisis-induced collapse in market valuations, combined with elevated debt exposures, drove unprecedented capital shortfalls across the sector. Following 2010, aggregate SRISK declined substantially, supported by large-scale deleveraging, higher regulatory capital ratios, and the implementation of macroprudential reforms. From 2014 onwards, SRISK stabilises at roughly half of its crisis peak, although residual vulnerabilities persist, particularly among globally active institutions. The COVID-19 shock in 2020–2021 triggered a temporary resurgence in system-wide SRISK, as heightened volatility and market stress reduced equity buffers, but the magnitude of the shortfall remained well below pre-crisis levels.

Notably, building societies contribute only marginally to aggregate SRISK throughout the sample period. Their share is estimated at approximately 3.5% relative to the entire UK financial system and around 6% when measured within the combined banking and building societies sector. Their contribution remains below 5% even during periods of financial stress, and they consistently record one of the lowest SRISK values across all institutional groups, underscoring their limited systemic footprint and resilience to market shocks. By comparison, the insurance, financial services, and real estate segments account for a modest but increasing share of total SRISK, around 21% on average, reflecting the gradual diversification of systemic risk outside the traditional banking sector after 2015.

The persistently low SRISK contribution of building societies aligns with their strong accounting-based stability, as evidenced by the Z-score analysis, and further supports the view that the sector functions as a shock absorber rather than a transmitter within the broader financial system. To examine the distribution of systemic risk within the sector, we next decompose SRISK across individual building societies. Figure 14 provides this more granular view of systemic risk within the sector, decomposing SRISK across building societies grouped by size. The results reveal a significant concentration of systemic risk among the five largest building societies, namely Nationwide, Coventry, Yorkshire, Skipton, and Leeds, which consistently account for more than 92% of the sector's aggregate SRISK throughout the sample. This concentration mirrors their dominance in total assets and mortgage lending, as well as their greater exposure to macrofinancial shocks. By contrast, the contribution of mid-sized and smaller societies is negligible, reinforcing the notion that systemic vulnerability within the sector is concentrated among a handful of large institutions whose scale and interconnectedness make them more sensitive to market stress.

The reported cyclical movements confirm that SRISK responds not only to leverage and capital adequacy, but also to evolving macroeconomic expectations and shifts in market sentiment, functioning as a forward-looking complement to regulatory stress test outcomes. From a policy perspective, these findings align with the Bank of England's macroprudential stance, which recognises that system-wide risks in the UK are concentrated among large, complex banking groups, while the building societies sector generally plays a stabilising role in household credit intermediation (BoE, 2024). However, the continued expansion of the largest building societies, coupled with their growing mortgage exposure, underscores the need for ongoing monitoring, particularly under conditions of housing market stress or rising funding costs.

Figure 14: SRISK within the building societies sector by size group



Note: The figure decomposes the aggregate SRISK of the building societies sector into three size groups over the period 2000–2024. The groups consist of: (i) the five largest building societies, (ii) societies ranked 6th–10th by total assets in 2024, (iii) societies ranked 11th–20th, (iv) societies ranked 21st–30th, (v) societies ranked 31st–42nd, and (vi) inactive building societies (those no longer operating). SRISK represents the expected capital shortfall under a system-wide stress scenario. Source: Author's calculations based on BSA and Thomson Reuters Eikon Datastream data.

4.3 Exposure–ΔCoVaR

To complement the SRISK results, which capture the potential capital shortfall institutions would face under market stress, we also estimate Exposure–CoVaR, a market-based measure of resilience to systemic shocks. The measure is derived from the CoVaR methodology introduced by Adrian and Brunnermeier (2016) that captures the spillover of tail risk across institutions. The methodology builds on the traditional Value-at-Risk (VaR) measure, which is a measure of idiosyncratic risk and focuses on losses at the level of an individual institution. Instead, CoVaR evaluates how the risk of the system index changes when an examined institution is under stress. It therefore highlights interdependencies and contagion channels, and has been widely adopted in systemic risk monitoring frameworks across jurisdictions (Adrian & Brunnermeier, 2016; López-Espinosa et al., 2012; Kladakis et al., 2025; Skouralis, 2023).

One of the advantages of this measure is that it is bidirectional, and Adrian and Brunnermeier (2016) also present the Exposure–CoVaR measure that identifies how vulnerable an institution becomes when the financial system itself is under stress. The interpretation is straightforward: A larger (in absolute value) Exposure–ΔCoVaR indicates that an institution is more sensitive to systemic shocks, while a smaller value suggests greater resilience.

In simple terms, Exposure–ΔCoVaR measures the deterioration in a company's or a sector's performance following distress on the financial market index, whereas SRISK focuses on how much distress an institution would create for the financial system. Therefore, Exposure–ΔCoVaR complements SRISK by shifting the lens from systemic impact to systemic resilience. In our context, Exposure–CoVaR is a particularly useful measure for building societies, since their financial stability role lies less in transmitting systemic shocks and more in maintaining credit provision and deposit stability when broader market conditions weaken. While individually they may not pose large risks to the system through capital shortfalls, their aggregate stability is critical for households' access to mortgages and savings products during systemic downturns.

For the estimation we start from the definition of VaR as presented in Equation (6). The Exposure–CoVaR in Equation (7) is defined as the VaR of an examined institution when the system index is under distress (at its VaR). We estimate the 5th percentile, defined as the tail threshold, and the median. The difference between the two gives us the $Exposure - \Delta CoVaR^{s|i}$ and reflects the incremental risk that an institution faces when the system moves from normal to stressed conditions.

$$P\,(R_t^i < VaR^i) = q \tag{6}$$

$$P\,(R_t^s < CoVaR^{s|i} | R_t^i = VaR^i) = q \tag{7}$$

$$Exposure - \Delta CoVaR^{s|i} = CoVaR_{q=0.05}^{s|i} - CoVaR_{q=0.5}^{s|i} \tag{8}$$

The estimation is based on regressing system-wide returns on institution-level returns using quantile regressions. The Exposure–ΔCoVaR framework measures how strongly the downside outcomes of a financial institution's balance sheet co-move with adverse conditions in the broader financial system. The measure is designed to capture systemic risk in listed companies as it typically employs company equity returns against the market index or a portfolio of the examined firms. In our case, we use total asset growth as a measure of relative performance. More specifically, the dependent variable is firm (or sector) i-level asset growth ($R_{i,t}$), while the systemic factor is the financial system's aggregate asset growth (S_t). Conceptually, the measure captures the additional contraction in asset growth observed when the financial system moves from a normal state, represented by the median of the systemic variable, to a stressed state, defined by its lower quantiles (e.g. the 5th percentile).

Each regression takes the form:

$$Q_\tau(\,R_{i,t} \mid S_t\,) = \alpha_\tau + \beta_\tau S_t + \varepsilon_\tau \tag{9}$$

The slope coefficient β_τ measures how the conditional quantile of firm asset growth responds to changes in system-wide financial conditions. The analysis uses annual data from 2000–2024, yielding 24 observations per sector. Given the limited sample size and the use of tail quantiles, inference is based on non-parametric bootstrap resampling with 1,000 replications. System distress is defined using the

5th percentile of the distribution of system-wide asset growth, while the median represents normal conditions. The system moves from normal to stressed conditions when aggregate growth declines from 3.30% (median) to −7.11% (5th percentile). For each sector i (banks or building societies), we compute the conditional Exposure–CoVaR at the 5th percentile, $CoVaR_{0.05}^{i|S}$, and subtract the benchmark level $CoVaR_{0.5}^{i|S}$ to obtain the incremental systemic risk measure $\Delta CoVaR^{i|S}$.

The mathematical representation of $Exposure - \Delta CoVaR_{0.05}^{i|S}$ is as follows:

$$Exposure - \Delta CoVaR_{0.05}^{i|S} = \hat{\beta}_{0.05} \times (VaR_{0.05}^{S} - VaR_{0.5}^{S}) \tag{10}$$

This specification is particularly suitable for the dataset used here, which covers both listed and non-listed financial institutions. The method does not rely on market-based returns and can therefore be applied to building societies, which are not publicly traded. For comparison purposes, we proceed by analysing the building societies sector and the banking sector against the system asset growth. The latter includes all listed financial institutions and building societies.

Table 2 reports the quantile regression estimated coefficient $\hat{\beta}_{0.05}$ and the Exposure–ΔCoVaR estimates. The tail dependence coefficients $\hat{\beta}_{0.05}$ reveal a clear hierarchy of systemic sensitivity across sectors. For building societies, the estimated tail beta is 0.441 ($p = 0.008$), indicating that a 1 percentage point decline in system-wide asset growth during severe stress episodes (5th percentile) is associated with a 0.44 percentage point fall in the aggregate building societies sector's asset growth. In contrast, banks display a substantially stronger tail response, with $\hat{\beta}_{0.05}$ being 0.969 ($p < 0.001$), suggesting an almost one-for-one pass-through of systemic shocks to bank balance-sheet growth. This confirms that banks are far more procyclical and tightly linked to aggregate financial conditions than building societies.

The Exposure–ΔCoVaR estimates quantify the marginal downside contribution of each sector to systemic risk. For building societies, the estimated $Exposure - \Delta CoVaR_{0.05}^{BS|S}$ is −4.59%, meaning that, when the financial system moves from a normal state (median) to a distressed state (5th percentile), building society asset growth falls by an additional 4.6 percentage points relative to typical conditions. The effect is economically meaningful and statistically significant, indicating that building societies transmit distress to the system during tail episodes, but only moderately. The effect is far stronger for banks. The $Exposure - \Delta CoVaR_{0.05}^{Bank|S}$ is −10.09%, more than twice the magnitude estimated for building societies. This implies that banks experience a severe contraction in balance-sheet growth when systemic conditions deteriorate, exerting a disproportionate amplifying effect on the downside risk in the financial system. This finding is consistent with the structural characteristics of banks (greater reliance on wholesale funding markets, higher leverage, and more cyclical loan portfolios) which make them more vulnerable to funding and credit shocks.

As a robustness exercise, we complement the sector-level analysis with a panel specification that exploits firm-level variation within each sector. Rather than relying solely on aggregate sector indices, we estimate tail dependence separately for all individual building societies, using firm fixed effects to capture unobserved heterogeneity. This provides an average exposure coefficient ($\hat{\beta}_{0.05}$) for the sector that is not driven by aggregation and allows inference based on cross-sectional as well as time-series variation. The panel results confirm the main findings from the sector-level analysis. Building societies exhibit only modest tail sensitivity to systemic conditions, with an average $\hat{\beta}_{0.05}$ of approximately 0.22, compared to 0.70 for the panel of the five largest and systemic UK banks. The corresponding Exposure–ΔCoVaR estimates, around −2.41% for building societies and −6.04% for systemically important banks, show the same ranking in systemic vulnerability as the aggregate results.

Table 2: Exposure–ΔCoVaR estimates for building societies and banks

	$\hat{\beta}_{0.05}$	*p-value*	$Exposure - \Delta CoVaR^{i\|S}_{0.05}$
Sector aggregate specification			
Building societies	0.441***	0.008	-4.593%
Banks	0.969***	<0.001	-10.090%
Panel data			
Building societies	0.217***	<0.001	-2.408%
Banks	0.702***	<0.001	-6.035%

Note: This table reports Exposure–ΔCoVaR estimates. Tail dependence is captured by $\hat{\beta}_{0.05}$, which represents the sensitivity of institution-level asset growth to system asset growth in the 5th percentile (stressed conditions) based on quantile regression. Exposure–$\Delta CoVaR^{i|S}$ measures the marginal contribution to downside systemic risk when the system transitions from its median state (50th percentile) to a distressed state (5th percentile). P-values are obtained using non-parametric bootstrap resampling with 1,000 replications. In the sector aggregate specification, the dependent variables are sector-level annual asset growth for building societies and banks, and the systemic factor is aggregate financial sector asset growth. Estimates are based on 24 annual observations (2001–2024). In the panel data model, we incorporate all building societies to obtain the sector's average $\hat{\beta}_{0.05}$ and a panel of the five largest/systemic UK banks for comparison purposes. ***p< 0.01, **p< 0.05, *p< 0.1.

As a robustness exercise, we complement the sector-level analysis with a panel specification that exploits firm-level variation within each sector. Rather than relying solely on aggregate sector indices, we estimate tail dependence separately for all individual building societies, using firm fixed effects to capture unobserved heterogeneity. This provides an average exposure coefficient ($\hat{\beta}_{0.05}$) for the sector that is not driven by aggregation and allows inference based on cross-sectional as well as time-series variation. The panel results confirm the main findings from the sector-level analysis. Building societies exhibit only modest tail sensitivity to systemic conditions, with an average $\hat{\beta}_{0.05}$ of approximately 0.22, compared to 0.70 for the panel of the five largest and systemic UK banks. The corresponding Exposure–ΔCoVaR estimates, around −2.41% for building societies and −6.04% for systemically important banks, show the same ranking in systemic vulnerability as the aggregate results.

The consistency between aggregate and panel-based estimation provides confidence that the results are not driven by composition effects or aggregation bias. Overall, the results demonstrate a clear asymmetry in systemic risk transmission across UK financial institutions. While both sectors contribute to downside risk under systemic stress, banks play a dominant role in propagating financial distress, whereas building societies appear relatively more resilient, reflecting their mutual ownership structure, conservative lending practices, and retail deposit funding base. These findings reinforce the view that institutional design shapes systemic fragility and supports the argument for differentiated macroprudential regulation across sectors.

5. Policy implications

The empirical findings of this study carry several implications for prudential supervision, macrofinancial policy, and the design of proportionate regulation in the UK. Overall, the results indicate that building societies perform a structurally stabilising role within the financial system, supported by high capitalisation, conservative risk appetites, and balance-sheet resilience. Their estimated contribution to system-wide risk, as captured by Z-scores, SRISK, and Exposure–ΔCoVaR, remains modest relative to banks. These findings are consistent with the view that the mutual business model supports financial stability, and reinforce the argument that institutional diversity enhances system resilience. Preserving business model heterogeneity should therefore remain an explicit macroprudential objective. The analysis points to the following areas for policy action:

First, the findings demonstrate that systemic risk measurement frameworks based primarily on listed firms do not fully capture non-listed institutions, even when those institutions collectively hold a material share of UK assets. Since conventional market-based indicators such as SRISK and CoVaR rely on equity price data, non-listed firms are excluded by construction. This study shows that reliable balance-sheet-based proxies for systemic risk can be constructed, which could complement existing market-based indicators within the Bank of England's systemic risk monitoring architecture, including ongoing data initiatives such as the Future Data Collection (FDC) programme. This would enhance cross-sector comparability and align risk measurement more closely with the structure of the UK mortgage market.

Second, the evidence supports the continuation of a proportionate regulatory regime for the building societies sector, consistent with the Bank of England's Strong and Simple framework. Smaller and mid-sized building societies exhibit low systemic externalities and stable solvency buffers, which justify simplified prudential requirements and reduced reporting burdens. However, the concentration of over 92% of sector-level SRISK in the five largest societies provides quantitative support for the existing tiered and risk-based supervisory approach, with oversight calibrated to systemic footprint. This implies regulatory proportionality for the majority of societies, complemented by targeted expectations for the largest firms, including enhanced liquidity monitoring, more frequent scenario testing, greater transparency of key risk metrics, and forward-looking capital planning linked to concentration risk management.

Third, the results highlight that competition and institutional diversity can be stability-enhancing. The LOO analysis shows that the presence of building societies improves aggregate Z-scores, indicating a stabilising effect on system solvency. This supports the case for preserving diversity within the UK financial architecture and aligns with the argument that systems dominated by a single business model are more prone to correlated failures. Policy frameworks should therefore resist convergence toward uniform regulatory design and instead recognise the prudential value of business model diversity and the role of relationship-based retail intermediation in supporting funding stability, depositor stickiness, and regional financial inclusion.

Fourth, while the building societies sector does not pose significant systemic risk, our analysis does not explicitly capture its collective mortgage exposure, which nonetheless warrants explicit consideration in macroprudential scenario design. To avoid underestimating mortgage-related amplification mechanisms, building societies should be incorporated proportionately into the Bank of England's System-Wide Exploratory Scenario (SWES) framework through sector-specific stress paths that reflect mortgage concentration, refinancing risk, and regional house price dynamics. This would ensure that stress testing reflects both their risk exposure and their stabilising funding model, without imposing a disproportionate supervisory burden.

6. Conclusions

This report provides a comprehensive empirical assessment of the systemic importance and resilience of building societies within the broader financial system. By integrating accounting-based indicators of solvency (Z-scores) with market-based measures of systemic risk (SRISK and Exposure–ΔCoVaR), it offers a multidimensional view of how building societies interact with macrofinancial conditions. The findings indicate that building societies act as stabilisers rather than amplifiers of systemic stress within the UK financial system. When included in system-wide stability metrics such as aggregate Z-scores, they increase the overall resilience of the financial system, particularly during stress periods such as the GFC and the COVID-19 pandemic. This reflects their high capitalisation, low leverage, retail-funded balance sheets, and conservative asset strategies.

A key methodological contribution of this analysis is the extension of systemic risk estimation to non-listed financial institutions. Building on Engle et al. (2024) and Skouralis (2026a), we apply an indirect SRISK framework based on balance-sheet fundamentals, demonstrating that systemic risk can be assessed reliably even in the absence of market data. This approach addresses an empirical and regulatory blind spot by enabling the inclusion of building societies and other mutuals in systemic risk surveillance, which currently focuses predominantly on listed banks and market-based indicators. Consistently, market-based estimates show that building societies do not contribute substantially to aggregate SRISK, accounting for approximately 6% of the banking and building societies sector's SRISK and around 3.5% of the UK financial system's SRISK.

However, the analysis also reveals that systemic risk within the sector is unevenly distributed. The five largest building societies account for over 92% of sector-level SRISK, reflecting their scale and concentration in mortgage intermediation. While their systemic contributions remain modest compared to large commercial banks, their increasing mortgage market share implies a growing systemic footprint over time. This supports the case for graduated prudential oversight, maintaining proportionality for the majority of societies while applying enhanced but targeted supervisory expectations to the largest institutions.

In addition, this is the first study to apply an Exposure–ΔCoVaR framework to non-listed financial firms by exploiting annual asset growth data to proxy return dynamics. The results further indicate that building societies are only weakly connected to systemic tail risk relative to banks, reinforcing their role as shock absorbers during periods of financial distress. Overall, the findings underscore the systemic value of institutional diversity. The mutual business model, based on member ownership, retail funding, and conservative balance sheet strategies, supports financial stability and credit continuity through the economic cycle. Building societies therefore represent a structural source of resilience in UK financial intermediation. Their contribution is likely to become increasingly important as the financial system adapts to pressures from housing market risks, funding cost volatility, and rising digital competition. Ensuring the continued strength of the building societies sector is not only important from a competition and consumer perspective, but also integral to maintaining a resilient and diversified financial system.

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