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MODELING METHODOLOGY

Managing Earnings Volatility and Uncertainty in the Supply and Demand for Regulatory Capital: The Impact of IFRS 9

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Abstract

This paper presents a novel modeling approach that allows for better management of the interplay between supply and demand dynamics for regulatory capital, combining an economic framework with regulatory capital and new loss recognition rules. The framework is particularly relevant in understanding the extent to which IFRS 9 can lead to more aggressive provisioning, which feeds into earnings volatility. Our approach provides guidance on how organizations can better manage their capital buffer, considering investment concentration, its impact on earnings volatility, and the relationship with regulatory capital requirements. Imperative to portfolio management, the framework recognizes the likelihood of a capital shortfall being significantly impacted by portfolio asset class, geography, industry, and name concentration, as extreme fluctuations in capital supply and demand occur more often for institutions holding more concentrated portfolios. Finally, we discuss integrated investment and strategic decision measures that account for the full spectrum of economic risks and interactions with regulatory and accounting rules, as well as instruments' contribution to earnings volatility and capital surplus dynamics.

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1. Introduction

With stringent regulatory and accounting requirements, risk managers can struggle with incorporating regulatory capital requirements and loss accounting rules into investment decisions. An economically appealing approach considers stakeholders who maximize return per unit of risk while facing regulatory capital constraints, with the final investment rules recognizing that both regulatory capital and economic risk should enter into investment decision rules.[1] Intuitively, an investment with less concentration risk, all else being equal, is better diversifying and more appealing. Similarly, an investment that attracts less regulatory capital, all else equal, is less constraining and more appealing. Accordingly, managers can use integrated metrics that account for both regulatory capital and economic risks, such as regulatory-adjusted return on risk-adjusted capital or composite capital measures that reflect regulatory capital constraints, as well as economic risks, to make investment decisions.

In addition to considering regulatory requirements and economic risks related to concentration effects, the question of being able to fulfil future regulatory requirements is material. In reality, credit deterioration impacts earnings along with increases in regulatory capital, resulting in a potential capital breach. The likelihood of such a breach depends very much on a portfolio's composition, the degree to which it is diversified, and the internal supply of equity. Ideally, investment decision rules should account for the likelihood and cost of breaching future regulatory capital requirements.

The key to managing the dynamics in regulatory capital requirements is to quantify the likelihood that the supply of capital is sufficient to address future regulatory capital requirements. This probability is determined by the dynamics of regulatory capital supply and demand, with the supply affected by earnings and loss recognition rules. Compared to its predecessor, IAS 39, the new IFRS 9 accounting standard for financial instruments requires institutions to set aside provisions at origination. In addition, the staging rule for IFRS 9 requires institutions to update loss allowance to reflect changes in credit quality at each reporting date, which can increase earnings volatility, which flows into the supply of capital.

This paper examines how IFRS 9 affects regulatory capital supply and demand. We provide an overview of how an institution can utilize integrated measures that account for economic risks and regulatory capital for better capital management. Our approach leverages an economic framework similar to the one proposed by Levy, Kaplin, Meng, and Zhang (2012) (LKMZ), where stakeholders maximize return per unit of risk, while facing regulatory capital constraints. In addition to recognizing current regulatory capital requirements, this paper incorporates uncertainty in the supply and demand for regulatory capital coming from changes in the credit environment.

We organize the remainder of this paper as follows:

- Section 2 discusses the impact of IFRS 9 on regulatory capital management.
- Section 3 provides details on how an economic framework can be leveraged to manage uncertainty in the supply and demand for regulatory capital.
- Section 4 concludes.

[1] For example, Levy, Kaplin, Meng, and Zhang (2012) (LKMZ) introduce regulatory capital-Adjusted RORAC measure by integrating economic risk with regulatory capital under a CAPM framework. Xu and Levy (2015) extend LKMZ's model and create a Composite Capital Measure that serves as a capital allocation measure that accounts for both regulatory capital requirements and economic risk.

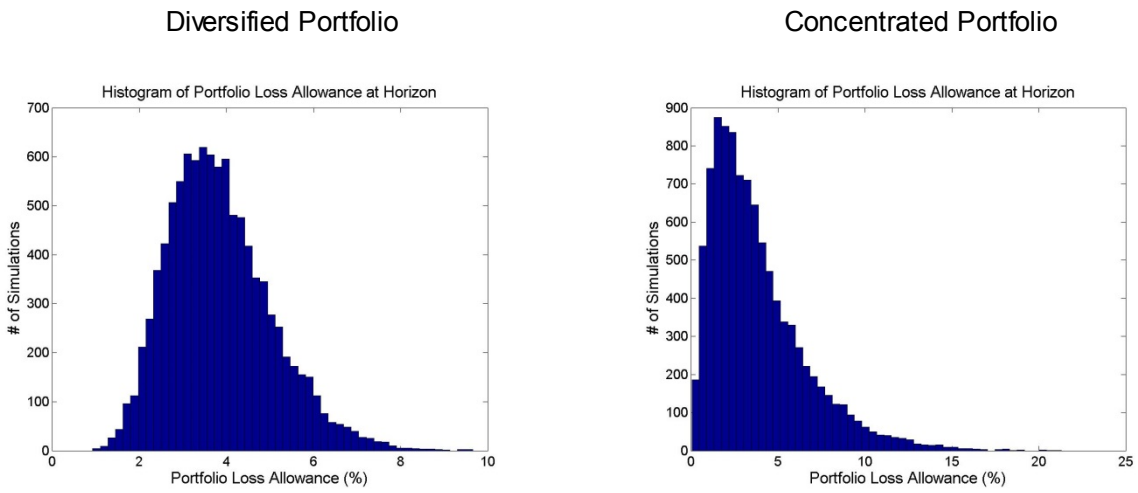
2. Impact of IFRS 9 on Regulatory Capital Management

2.1 How IFRS 9 Affects the Dynamics of Regulatory Capital at Horizon

IFRS 9 affects the supply and demand for regulatory capital in at least two ways. First, IFRS 9 requires an institution to recognize 12-month expected credit loss of a financial instrument as soon as the instrument is originated or purchased. Meanwhile, IFRS 9's predecessor, IAS 39, generally requires material credit events to trigger loss provisions. Thus, IFRS 9 can cause an initial reduction in the Tier-1 capital supply, driving required regulatory capital to be more constraining for banks using a standardized approach to compute regulatory capital.[2] In addition, IFRS 9 staging rules can result in further reduction in the capital supply when lifetime losses must be considered.'

Second, IFRS 9 can increase the volatility in capital supply. IAS 39 requires provisioning under significantly negative credit triggers, which dampens the impact of credit migration on the volatility of capital supply. In contrast, under IFRS 9, institutions update loss allowance to reflect changes in credit risk on every reporting date, resulting in credit migration being accounted for in capital supply. An important corollary to this observation is that more concentrated portfolios can be impacted more by the IFRS 9 volatility increase. Intuitively, a perfectly diversified and granular portfolio exhibits no volatility. Figure 1 compares the IFRS 9 loss allowance at horizon of a well-diversified portfolio and a portfolio with high concentration in the oil industry. We can see that, for the simulated trials, loss allowance for the well-diversified portfolio never exceeds 10%. In contrast, the diversified portfolio loss allowance at horizon exceeds 10% in 3.7% of trials. All else being equal, organizations' loss provisions will be more extreme for concentrated credit portfolios, driving a higher volatility in earnings and likelihood of facing a regulatory capital shortfall.

Figure 1 Loss Allowance at horizon of diversified portfolio vs. concentrated portfolio.



2.2 Quantifying Change in Capital Surplus

As discussed above, IFRS 9 loss provision affects the supply of capital, potentially impinging on an institution's ability to meet regulatory capital requirements. The dynamics of loss allowance, with each reporting date, can further constrain the organization, as it should consider buffering for a deteriorated credit environment. Capital surplus measures the gap between capital supply and demand. In the context of Basel III and IFRS 9, the change in capital surplus associated with an instrument is equal to the change in regulatory capital required by Basel III, and earnings driven by interest income, default losses, and provisions — either 12-month or lifetime, depending on the asset's stage.

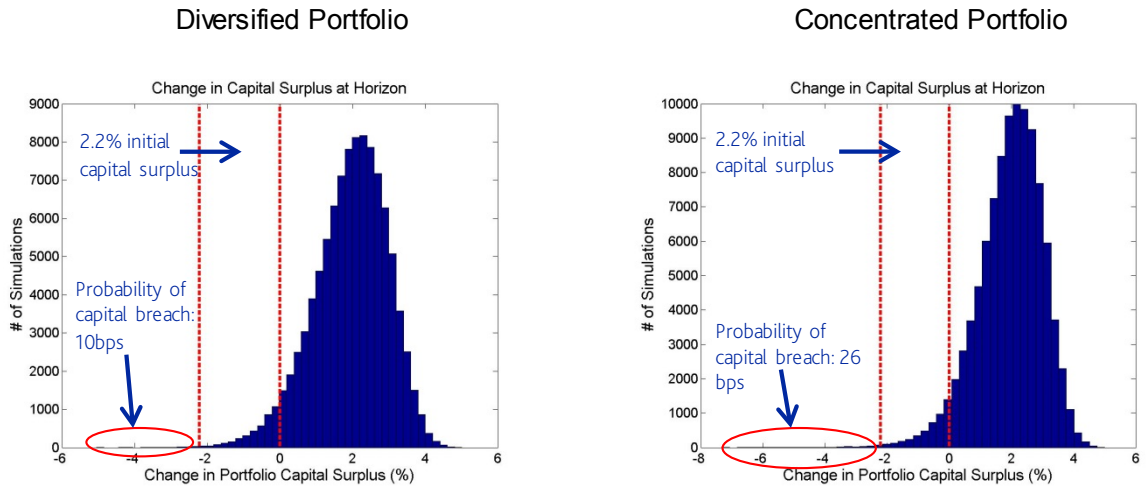
Since the change in capital surplus captures the dynamics of both required regulatory capital and earnings, it provides a foundation for measuring how much capital must be set aside. With that said, the expected change in capital surplus associated with each individual instrument does not account for concentration and diversification risks. Consequently, an institution should not use it as the only measure when making investment decisions. For example, all else being equal, an instrument with a 4% expected increase in capital surplus might be more attractive than one with a 6% expected increase, if its credit risk is less correlated with other instruments in the portfolio.

[2] Under the Basel III rule for advanced IRB banks, the impact of IFRS 9 on Tier-1 capital supply is less pronounced, as the gap between loss allowance and Basel EL is deducted from Tier-1 capital under both IFRS 9 and IAS 39.

3. Leveraging an Economic Framework to Manage Earnings Dynamics and the Demand and Supply of Regulatory Capital

As discussed in the introduction, the LKMZ framework treats the regulatory capital requirement as a static investment constraint. In reality, credit deterioration results in changes to regulatory capital requirements and its potential violation. The likelihood of such a breach depends greatly on the portfolio composition, the degree to which it is diversified, and its capital surplus. Investment decision rules should account for the likelihood and the cost of breaching future regulatory capital requirements. Institutions have addressed this issue by adopting buffers beyond their stated required regulatory capital requirements. The challenge is in quantifying the buffer, how portfolio composition can improve managing that buffer, and how all this should feed into investment decision rules. Intuitively, institutions should set aside capital buffers, so the likelihood of a capital breach does not exceed a target probability. In addition, institutions should assign an additional capital buffer to each instrument according to the expected change in capital surplus associated with the instrument and how that change contributes to the overall likelihood of a breach. Figure 2 depicts the distribution of changes in capital surplus.

Figure 2 Probability of capital breach: diversified portfolio vs. concentrated portfolio.



The left-hand side of Figure 2 depicts the distribution of changes in capital surplus over a one-year horizon for a sample loan portfolio.[3] Limiting the probability of a capital breach to 10 bps requires a 2.2% additional capital buffer to be set aside beyond what is needed to address current regulatory capital requirements. On the right, Figure 2 depicts the capital surplus distribution for a more concentrated portfolio that does not benefit from country and industry diversification. In this case, the probability of a capital breach more than doubles, to 26 bps, if the same 2.2% additional capital buffer is set aside.

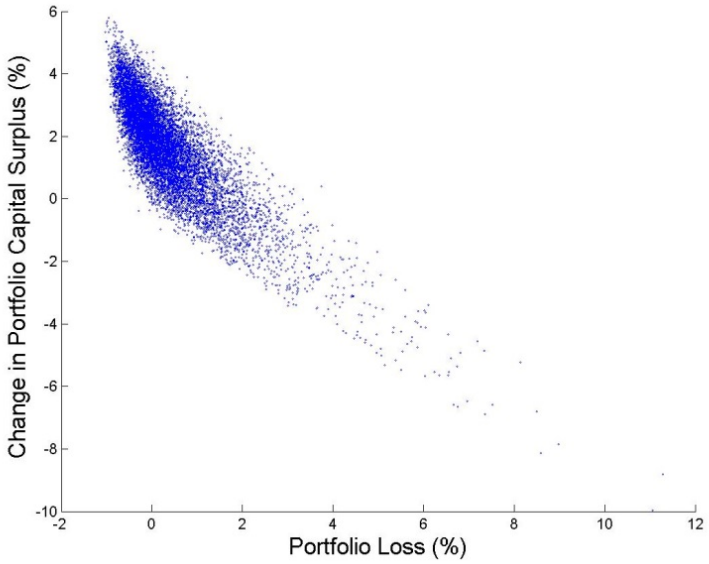
It is important to note that, even though the two portfolios shown in Figure 2 have different capital breach probabilities, both have the same expected change to their capital surplus: 1.95%. Therefore, it is clear that the expected change to the capital surplus by itself is not sufficient to describe an instrument's risk, as it does not account for portfolio concentration and diversification effects. This trait is similar to expected loss measures not being impacted by diversification and concentration.

Figure 3 provides an additional perspective to the dynamics of capital surplus by comparing it with portfolio fair value loss. While the change in portfolio capital surplus has a general inverse relationship with portfolio loss, there is a fair bit of dispersion. One primary reason behind this observation is that fair value portfolio loss, which includes both default loss and credit migration loss, is entirely driven by the migration of point-in-time probability of default, while the change in capital surplus is partly determined by the migration in through-the-cycle probability of default, which feed into regulatory capital calculations.

To account for the full spectrum of economic risks and interactions with regulatory can accounting rules, one can leverage the LKMZ framework and incorporate the additional required capital buffer to each instrument, accounting for the required capital surplus that ensures future capital solvency. The resulting investment decision rules account for the distribution of changes in capital surplus as well as the concentration and diversification risks associated with each instrument.

[3] The required regulatory capital for each instrument is computed based on the Basel III advanced IRB approach in all examples in this paper.

Figure 3 Change in capital surplus vs. portfolio loss.



4. Summary

The introduction of IFRS 9 changes the dynamics of capital supply and demand and affects institutions' investment decisions. In particular, the new loss recognition rule under IFRS 9 can make regulatory capital requirements more stringent and increase the uncertainty of capital adequacy in the future. IFRS 9 can also introduce significant concentration risk into capital planning. These implicit costs should be accounted for in investment decisions and capital allocation. An extended LKMZ model leverages an economic framework and derives investment decision rules based on the full spectrum of risk, and it accounts for regulatory capital as well as future dynamics in capital supply and demand.

References

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