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Banks' internal capital markets: how do banks allocate capital internally?

Banks' internal capital markets: how do banks allocate capital internally?

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- Banks allocate capital to their business lines to assess those lines' relative performance, which informs their strategic decisions. Capital allocation, together with Fund Transfer Pricing (FTP), are two important internal processes used by banks to support business optimisation decisions.

- This article discusses the range of methods that banks use to allocate equity capital to their business lines, drawing on reviews conducted by the Prudential Regulation Authority (PRA). It complements a previous *Quarterly Bulletin* article[1] which describes banks' FTP practices. We also discuss in this article potential implications of capital allocation methods for banks and prudential regulation.

Overview

Banks' decisions on whether to offer a financial service such as mortgage loan and on what terms are important in aggregate for economic activity and for risk in the financial system. On the one hand, doing the right business on the right terms is essential for the long-term financial health of banks, which in turn contributes to securing their resilience and the smooth functioning of the financial system. On the other hand, these choices affect the availability and the accessibility of these services for banks' customers.

The capital allocation framework plays an important role in these decisions. It facilitates the banks' assessment of relative performance across their business lines. Furthermore it enables banks to account for the use of equity capital — a scarce resource, in the short term at least — in the pricing of their products.

This article discusses the capital allocation practices observed in a sample of banks reviewed by the PRA. In general, risk-weighted assets (RWAs) — a bank's assets and off balance sheet exposures, weighted according to their risk as measured under the regulatory framework — are the primary basis of the allocation process. Some banks go further, employing more complex methodologies with a blend of different regulatory capital metrics. An example of this is the inclusion of the leverage ratio requirement — a non risk adjusted metric — in the allocation process. Where relevant, banks also take into account the capital buffer for global systemically important banks (G-SIBs) and the impact of severe stress scenarios on their equity capital.

The PRA reviews show that there are significant variations in the allocation practices used by banks. It is important for banks to understand the limitations of their practices and the implications of different approaches for their business decisions, strategy and incentives within their organisations. Banks should consider carefully the most appropriate approach for their circumstances (eg their business model) and continue to keep this under review.

From a regulatory perspective, different approaches used by banks may have implications for the effectiveness, and impact of micro and macroprudential policies. For example, some banks allocate capital to business lines proportionate to the individual contributions of those lines to the group's overall stress losses. This could generate stronger incentives for business lines to take actions to mitigate losses in future periods of stress.

The purpose of sharing the results of these reviews is twofold. First, it is useful for banks to understand the range of practices and thus, consider how to evolve their thinking on a topic which has broad implications. Second, it may encourage researchers and practitioners to develop new thinking. For example, more research is needed to understand the implications for prudential policies or to shed more light on how banks should allocate capital, perhaps considering their business models.

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(1) See Cadamagnani, Harimohan and Tangri (2015).

Introduction

Capital allocation is the method that banks use to determine the notional amount of equity capital needed to support a business. Capital budgeting is the process of deploying banks' equity capital to support banks' strategic objectives.

Banks are improving their capital allocation and budgeting practices to adjust to the strengthening of the regulatory capital framework in the aftermath of the financial crisis. Banks are now subject to tougher and a larger number of regulatory capital metrics. In addition, banks also have to comply with new liquidity standards and some regulatory constraints on the group holding structure which may also affect how they measure business performance, but these factors are not considered here.

This article presents the findings of two PRA reviews on capital allocation practices used by banks to assess the relative profitability of different business lines such as retail, commercial or investment banking. It aims to shed light on a commercial practice that is still not publicly well-known and is undergoing significant changes following the post-crisis overhaul of the banking regulatory capital framework. And, to flag some questions or issues that could benefit from further analysis and research by the academic community and practitioners on the policy implications of these capital allocation approaches.[2]

To assess business performance, banks use a return metric which is the ratio of profits generated by business lines to the notional equity capital allocated to them. Although banks may also have different approaches to calculating profits, this article will concentrate on the denominator of this return metric, ie how banks determine the notional allocated equity capital.

In this article we first explain why, in the post-crisis environment, banks face greater challenges in managing their capital resources as far as regulatory metrics are concerned. We then discuss the role of capital allocation and budgeting in banks' strategic management as well as their impact on economic activities. Finally, we describe banks' approaches to capital allocation and briefly discuss their capital budgeting practices. An annex sets out the key elements of the international post-crisis standards for capital requirements. The content of the first three sections may already be quite familiar to readers with a good conceptual knowledge of capital allocation. These readers may prefer to go directly to the last section describing banks' practices.

Managing capital: past and present

Equity capital which is used to finance banks' activities is, with some adjustments, often referred to as common equity Tier 1 (CET1) capital in the regulatory capital framework. It is the type of capital with the highest loss-absorbing quality.[3] This feature, together with the high-leverage characteristic of banks' balance sheets, means that the equity capital is a relatively costly source of financing. Managing this resource has thus always been important for banks.

The challenges around capital management linked to regulatory metrics have increased following the strengthening of the regulatory capital framework after the global financial crisis. Banks have been required to significantly increase the quantity and the quality of their capital. New capital buffers and a leverage-based requirement[4] have been introduced to reinforce the robustness of the regulatory capital framework.

These changes make the management and the efficient use of equity capital more important for banks if they are to meet the return on equity expected by their shareholders. Banks are now increasingly focusing on how to allocate capital to their business lines to drive optimal business decisions.

Role of capital allocation and capital budgeting in banks' strategic management

Capital allocation and capital budgeting are two of the core components in the bank-wide strategic management process. **Figure 1** represents the cycle that links bank strategy, capital budgeting and capital allocation with performance measurement.

Figure 1 Role of capital allocation in banks' strategic management
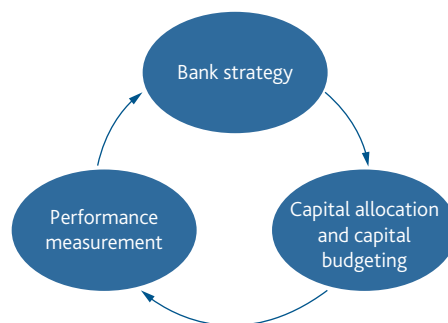
Banks translate their strategic plans into detailed capital budgets. A bank's strategic plan sets out the strategy such as where to grow, which businesses to downsize and where to make strategic investments to secure future, profitable growth. A capital budgeting process deploys the available equity capital to business lines consistent with this plan. The

(2) Given that banks' capital allocation practices are still evolving, and that best practices have not emerged yet, this article does not aim to offer policy conclusions at this stage.
(3) For more detailed discussion on why equity capital has the highest loss-absorbing quality, see Farag, Harland and Nixon (2013).
(4) Under Basel III, this requirement is called the 'leverage ratio requirement'. In this article, we will use interchangeably the two terms 'leverage ratio requirement' and 'leverage-based requirement'.

deployment of equity capital resources also needs to be consistent with other strategic management tools such as a bank's risk appetite and its limit framework that sets hard limits on balance sheet and RWAs consumption, among others.

When banks engage in multiple activities, they need to be able to evaluate their different business lines on a common measurement standard. Capital allocation allows banks to assess the relative performance across different business lines against the amount of equity capital allocated. Its outcomes are thus important for the monitoring of performance against the strategy. Gaps between the expected and actual performance prompt banks to review their strategies. Periodic performance reviews are also helpful to keep track of the material changes in the business environment that may require substantial adjustment to the business strategy.

Capital budgeting, capital allocation and economic activities

Effective practices for capital allocation and budgeting contribute to securing the safety and soundness of individual banks and thereby also contribute to a well-functioning financial system. Indeed, they allow banks to appropriately recognise the levels of risk being taken and deploy equity capital where shareholders' returns can be made. This in turn helps ensure that banks have sustainable business models.

From the perspective of wider economic activities, banks' capital allocation approaches are one of the factors affecting the pricing of their products and the provision of financial services to the economy. In general, the prices of a bank's products reflect, among others, the cost of its financial resources including equity capital and debt. Internal debt funding cost is determined by the bank's FTP process. Capital allocation attributes the cost of equity capital back to business lines, products, and transactions that generate the need for this capital.

One common approach for banks to reflect this cost into their product prices is to assess whether profits made from a business or product meet an internal target rate of return — a return hurdle rate. Return hurdle rates are decided by a bank's management and are linked to the overall return on equity capital (RoE) the bank wants to achieve. These hurdle rates are set at business line, product and/or portfolio level depending on the characteristics of the underlying products.

In relation to the provision of financial services, the prices charged by banks for their services will affect the ability as well as the willingness of market participants to access these services. Moreover, banks' decisions on optimising performance across business lines may influence the

availability of some services by incentivising banks to increase or decrease their shares in specific businesses.

Banks' capital allocation practices

Recently, the PRA carried out reviews of the banks' approaches to allocating equity capital to their business lines. These reviews covered a range of banks with diverse business models. Their main objective was to understand how banks are embedding the regulatory capital framework into their decision-making processes and thus how they could respond to regulatory changes. This section describes the observed range of practices for allocating equity capital to different business lines to measure their relative performance.

Measuring business lines' performance
RoE and return on assets (RoA) are widely used by banks to measure and report performance. In addition, for the purpose of internal performance measurement, banks use a range of return metrics that assess the profitability of individual business lines against the amount of equity capital they use.

Definition of capital resources used in the allocation
The equity capital that banks allocate to their business lines is generally CET1 capital. Banks may however, for the purpose of allocation, make certain simplification adjustments to the way CET1 capital is calculated for regulatory purposes. One example of those adjustments is to not use the same deductions as specified in the regulatory framework or not make any deductions at all when computing allocated CET1 capital.

Application of regulatory capital metrics for capital allocation
Regulatory capital metrics can be classified into risk-based capital requirements and leverage-based (ie risk-insensitive) requirements. Risk-based capital requirements specify the amount of capital that banks need to have based on their RWAs. They include the Basel III minimum capital requirements and regulatory capital buffers. In some countries a capital add-on is imposed on banks to cover risks that are either not fully captured or not captured at all under the minimum capital requirements. Banks also maintain additional CET1 capital to cover the deterioration in their capital positions under stress situations where other regulatory capital buffers are judged to be insufficient to absorb stress losses. In this article we will refer to the impact of hypothetical stress-test scenarios on banks' capital positions as 'stress-testing measures'.

From the perspective of risk-based metrics, banks can choose to use, instead of regulatory capital, economic capital — the amount of capital that banks themselves assess as sufficient to cover their economic risks — to determine the capital needed to support their business lines. However, following the

strengthening of the regulatory capital framework, regulatory capital requirements are typically higher than banks' own economic capital assessments and therefore determine the amount of capital resources banks need to maintain. The PRA reviews found that all the banks surveyed use the regulatory capital method as the primary basis for their capital allocation framework.

In relation to the leverage-based requirements, they are specified as a ratio of a capital measure over a leverage exposure measure. This leverage exposure measure is a non risk adjusted measure of both on and off balance sheet positions of banks.

When setting up a capital allocation framework, banks decide *which* components of regulatory capital metrics should be considered for allocation and *how* they should be taken into account. The PRA observed that there are a range of practices among banks in terms of the selection and treatment of these various components. This could vary from using a single component such as RWAs to a blend of metrics that could incorporate various components of risk-based requirements along with leverage-based requirements. While all banks allocate CET1 capital on a basis which includes RWAs, there are significant variations in the way that banks take into account the regulatory capital buffers, the leverage ratio requirement and stress-testing measures. We describe below how banks are currently allocating CET1 capital to business lines using regulatory capital metrics.

Risk-based capital allocation approach — RWAs-based allocation

Under the RWAs-based allocation approach, the amount of CET1 capital allocated to business lines is determined on the basis of their RWAs usage. The advantage of this approach is the ease of use and transparency. Given that banks already calculate RWAs at the granular level of individual assets and exposures and have well-embedded RWAs reporting capabilities, RWAs lend themselves well to an allocation mechanism that can be applied at all levels of the organisation. The business line returns can also be aligned easily with the banks' overall RoE target.

Complexity can however arise when banks operate across multiple jurisdictions, where the regulatory capital rules for calculating RWAs differ. As an example, regulators could require banks to calculate their RWAs using either internal risk models or standard rules. The RWAs derived using the two approaches could differ significantly. If the regulator of the jurisdiction where a bank is headquartered allows the bank to use internal risk models while the local regulator for the jurisdiction where the business transaction is recorded allows the bank to use standard rules, the bank will have two versions of RWAs for the same asset. In such cases, banks typically apply a common allocation standard by using the RWAs

calculated in accordance with the regulatory capital rules applicable where they are headquartered.

All banks that we surveyed use RWAs in their capital allocation framework — either as a standalone metric or in combination with other regulatory metrics. Among banks that use RWAs as a standalone metric, some choose to allocate to business lines only the minimum component of their risk-based capital requirements. Others have opted to allocate all the components of their regulatory capital requirements, ie capital buffers as well. This aims to make business lines accountable for the full suite of regulatory capital requirements that banks have to meet.

Banks take into account other components of the total risk-based CET1 capital requirements and stress-testing measures in two different ways. Some apply these metrics uniformly and do not differentiate by business lines' contributions to CET1 capital requirements and stress-testing measures. Others instead consider the individual contribution of business lines to these requirements. We set out the first approach here and describe the second approach in the next subsection.

Banks determine a target CET1 capital ratio as part of their business strategy. A target capital ratio is the level of capital ratio that banks aim to maintain in normal conditions. They take into account all of the components of the risk-based CET1 requirements including regulatory capital buffers as well as an internal operating buffer to determine this target ratio. The internal operating buffer is an additional capital buffer determined by banks' management to avoid falling below the regulatory capital requirements because of unexpected fluctuations in the equity capital due to market-related factors.

Figure 2 depicts an example in which a bank uses RWAs as a standalone metric to allocate CET1 capital. In this example, we have assumed for simplicity that the bank's CET1 target capital ratio is 10% of RWAs. This target capital ratio is applied to the RWAs consumed by business lines to determine the

Figure 2 Example of standalone RWAs-based allocation
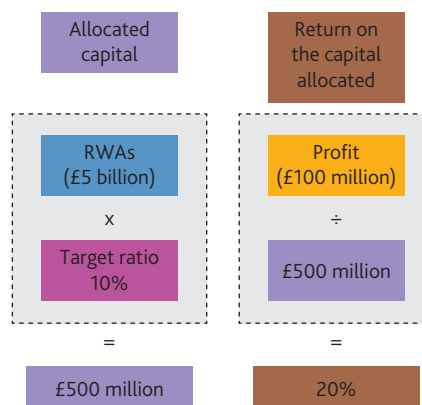
CET1 capital allocated to them. If the RWAs consumed by a business line are £5 billion and the profits it generates are £100 million, the CET1 capital allocated would be £500 million (£5 billion*10%) and the return on the capital allocated would be 20% (£100 million/£500 million).

The advantage of using this approach is its transparency and its linkage to the bank-wide target return on equity. However, if the bank has significantly higher levels of CET1 capital compared to its RWAs-based requirement, it will need to adjust the target return on CET1 capital allocated for each business line to ensure that the bank-wide RoE target is met.

Applying a uniform allocation approach for some regulatory capital buffers has a disadvantage — those business lines whose activities contribute relatively more to determining the size of these buffers are not required to generate profits commensurate to the risks that they generate for the bank and which these capital buffers are expected to address. Some banks have considered separate allocation approaches for two specific elements of the regulatory capital metrics — the stress-testing measures and the G-SIB buffer.

Taking account of specific components of the regulatory capital metrics

The PRA observed that some banks treated the stress-testing measures and the G-SIB buffer separately in their capital allocation framework. And some banks also took account of the leverage-based requirements — by using a blended approach where a weighted average of the risk-based and leverage-based requirement was allocated to business lines — while others did not account for leverage in their capital allocation process.

We describe the blended approach to capital allocation below (**Figure 3**).

Figure 3 Key components of a capital allocation framework
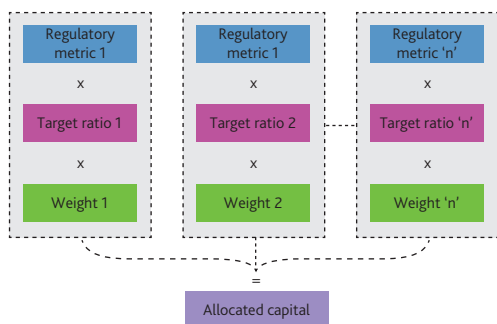
- **Regulatory metrics**: banks can include in their capital allocation framework one or several regulatory metrics among the following: (1) the Basel III minimum capital requirement; (2) leverage ratio requirement; (3) capital add-on and various capital buffers; and (4) stress-testing

measures. The PRA observed that banks have selected metrics such as RWAs, leverage exposure, G-SIB score[5] and stress-testing measures in their allocation framework.

- **Target ratios**: similar to the risk-based capital allocation approach, banks determine a target level for each of the regulatory metrics. The target level typically takes into account the regulatory requirements for the metric along with an internal operating buffer. It is the level that banks would like to maintain for each of the metrics under normal conditions.

- **Relative weights**: in order to obtain a blend of regulatory metrics, a percentage weight is assigned to each metric signifying its relative importance. This importance has typically been assessed depending on how binding the metric is for the overall bank. For instance, if the leverage ratio requirement is greater than the risk-based capital requirement for a bank, a higher weight is assigned to the leverage-based regulatory metric. Also, the relative weights are updated periodically by banks to reflect any material changes to the binding regulatory metrics.

In the above framework, a bank that allocates CET1 capital only on the basis of risk-based capital requirement would weight RWAs at 100%.

Treatment of leverage ratio requirement

The example below explains how banks have blended risk-based requirements with the leverage ratio requirement to determine the CET1 capital allocated to a business line (**Figure 4**).

Figure 4 Example of capital allocation on the basis of both risk-weighted and leverage ratio requirements
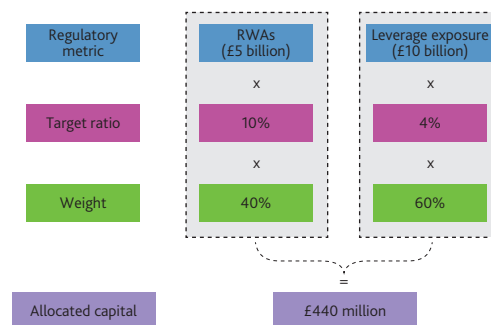
In the above example, a business line has £5 billion of RWAs and £10 billion of leverage exposure. The bank's target capital ratios for these metrics are 10% (CET1 ratio) and 4% (Tier 1

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(5) G-SIB score is used to identify (i) whether a bank should be classified as G-SIB and (ii) the magnitude of the G-SIB buffer imposed on banks. The Basel Committee on Banking Supervision (BCBS) developed a methodology to compute the G-SIB score for each bank based on size, interconnectedness, substitutability, complexity and cross-jurisdictional activity. See the detail of the methodology at www.bis.org/bcbs/gsib/.

leverage ratio) respectively. Relative weights of 40% and 60% are assigned to the two metrics. The leverage ratio requirement receives a higher weight in this example as it is assumed to be the more binding requirement for the bank on an overall basis. The allocated capital of £440 million is the weighted average of the product of the regulatory metric usage and respective target ratio (£5 billion*10%*40%+£10 billion*4%*60%).

Some banks do not allocate leverage exposure to their business lines for performance measurement. In such cases, banks still monitor the growth of the leverage-intensive business lines closely. Through such monitoring, bank management is kept aware of how much leverage exposure is being generated by these business lines. When the leverage ratio exceeds a certain level, management considers potential actions such as setting leverage limits to bring the overall leverage ratio within target levels.

Treatment of regulatory stress-testing measures

The PRA observed that some banks allocate the stress-testing measures individually to business lines taking into account their relative contributions. This means that business lines that make higher contributions to the banks' total stress-testing measures are allocated more CET1 capital.

Such an approach should make business lines more responsive to the stress-testing measures that they generate for the overall bank. That could heighten the impact of stress testing on banks' behaviour — for example creating stronger incentives for those parts of their businesses which contribute more to the banks' stress-testing measures to take risk-mitigation actions.

A challenge in the allocation of stress-testing measure is the use of materially different stress scenarios over time. Banks are exposed to different stress scenarios, which will have differing impacts on business lines depending on the specifications of these scenarios. In such cases, this will result in variations in the CET1 capital allocated to the business lines affecting their performance and future strategy.

Treatment of G-SIB capital buffer

Some banks are also subject to a G-SIB capital buffer[6] given the greater level of systemic risks they pose. The PRA observed that some of these banks have chosen to allocate the G-SIB buffer based on the specific contributions of business lines to the G-SIB score of the overall bank. In this case, all else equal, higher amounts of CET1 capital are allocated to business lines that contribute more to the bank's overall G-SIB score.

Even when banks do not allocate the G-SIB buffer to business lines based on relative contribution, they still undertake a heightened monitoring of the drivers of the G-SIB score. This is

because a higher G-SIB score can move the bank to a higher G-SIB score bucket and result in a step increase in the G-SIB capital buffer.

Banks' capital budgeting practices — supporting the delivery of the strategy

A capital allocation framework within a banking group enables return on equity capital to be measured consistently across business lines and products. Using this information, bank strategy is developed to deliver group targets and drive performance. Typically the strategy is updated in conjunction with the business planning process and shapes the future balance sheet of the group.

When setting strategy banks also produce a forward-looking risk appetite statement. The risk appetite includes equity capital metrics and is used to develop the business plan and the capital plan.

In these plans, the common framework for capital allocation across the banking group allows the contribution per unit of equity capital of the various business lines to be compared. This enables the group to focus on return on equity capital, which is often a key metric for stakeholders.

Often business lines are allocated a budget for the amount of equity capital that each of these lines can consume. Usually this is in the form of a RWA budget and any variances from this budget are closely monitored. Where a business line uses less RWAs than budgeted then this 'surplus' may be reallocated to other business lines. In contrast where a business line exceeds its RWAs budget, reductions in its balance sheet and/or risk may be required.

The sampled banks set RoE targets in a variety of ways. One method is to apply the same minimum return hurdle rate across their business lines. Another approach is to differentiate the hurdle rates by business lines.

In some instances banks may continue with businesses that do not earn the required hurdle rate on the basis, for example, that they expect the market conditions for that business to improve or when making that low return facilitates earning in higher return businesses.

Conclusions and implications of the findings from the PRA's reviews

Post-crisis reforms have significantly strengthened the regulatory capital framework for banks by increasing the required level of capital, raising its quality and introducing

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(6) See the annex for detailed explanation.

complementary solvency-based metrics to make the whole framework more robust to different types of uncertainties.

Reflecting these changes, regulatory capital now exceeds economic capital assessments for many of the banks surveyed by the PRA. It thus has more bearing on how banks develop their strategies and how they run their businesses, including the assessment of business lines' performance against those strategies.

One way in which banks are responding to these developments is by evolving their internal processes used to measure performance across their group. In particular, they are developing new approaches to allocating capital to their business lines that rely more on regulatory capital metrics.

The PRA reviews show that there is a range of capital allocation practices currently used — or being developed — in the industry. And, that they vary in their levels of complexity. Some banks favour simple approaches focusing on a single capital metric that is often the risk-weighted capital requirement. Others have developed more sophisticated capital allocation frameworks that use multiple metrics. Some also seek to allocate specific elements of regulatory metrics based on individual contributions of their business lines to the group's overall requirement for a given metric.

Different practices used by banks potentially have implications for the effectiveness of regulatory measures. For example, the allocation of stress-testing measures or G-SIB buffers based on the individual contributions of business lines to the group's overall stress impact and G-SIB score may generate stronger incentives for business lines themselves to take actions to mitigate stress losses and to reduce their systemic footprint.

In addition, the finding that several banks are explicitly allocating the leverage metric to their business lines may warrant further analysis. On the one hand, such an approach allows banks to manage their leverage more systematically.

On the other, it may make the leverage ratio requirement more influential in banks' business line decisions on risk-taking and on the supply and terms of their products. Indeed some academic papers (eg Acosta Smith, Grill and Lang (2017)) highlight the potential impact of this requirement on banks' risk-taking incentive. How strong this incentive is will depend, among other things, on how much capacity banks' business lines have to engage in such behaviour if they are also faced with the risk-based requirement. Such analysis is beyond the scope of this article and exercise. It will need to factor in the benefits of the leverage ratio requirement for resilience as well as risk-taking behaviour.[7]

These observations suggest that going forward, as banks evolve their allocation frameworks — in particular, as they assess the merit of more comprehensive frameworks versus simpler ones — they may wish to pay particular attention to the incentives such frameworks may create.

Regulators may also wish to monitor how banks are evolving their frameworks over time. For instance, it may be worth monitoring how the weights attached to different metrics are shifting and, depending on how any such shifts affect banks' behaviour, whether there are implications for the intended and unintended effects of prudential policies.

Finally, the range of different practices employed by banks raises questions about how banks should allocate capital — ie what an optimal approach would look like, perhaps taking account of different business models? The academic literature still sheds little light on this and the frictions flowing from them that can affect banks' resilience and risk-taking behaviour. The findings in this article suggest that further research by the academic community in these areas may be beneficial — both to guide banks as they refine further their practices and understand the associated incentive effects, as well as to help policymakers understand their significance in aggregate terms.

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(7) Acosta Smith, Grill and Lang (2017) for example find that resilience outweighs the
      risk-taking effect. Although, the paper focuses on the impact to leverage-constrained
      banks.

Annex
International post-crisis capital requirements

In the aftermath of the 2007–09 financial crisis, global regulatory capital standards have undergone substantial reform to address shortcomings in the pre-crisis framework and deliver a resilient banking system that can support the real economy. The changes made to these standards include a detailed revision of the risk-weighted capital requirements and the introduction of a leverage ratio requirement. They are also complemented by a forward-looking assessment of banks' capital position via stress testing conducted regularly by several central banks.

Post-crisis risk-weighted capital requirements

The post-crisis risk-weighted capital framework features significantly higher requirements for loss absorption and greater emphasis on higher quality of capital. It uses a much stricter definition of capital with, for example, so-called 'hybrid' capital instruments no longer recognised as eligible regulatory capital. The level of capital requirement has also increased. Under Basel III, the minimum amount of common equity Tier 1 (CET1) capital was raised to 4.5% of risk-weighted assets, and the corresponding Tier 1 capital ratio requirement is set at 6%.

The post-crisis capital framework is also better able to capture several types of risk such as market risk, counterparty credit risk and the risk of off balance sheet exposures as well as of securitisation activities. In some countries, to extend the range of risks captured within the regulatory framework, a capital add-on is imposed in addition to the basic Basel III minimum requirement. For example, in the UK, the PRA minimum capital requirement comprises the equivalent Basel III Pillar 1 minimum and a bank-specific capital requirement called Pillar 2A. It covers the risks which are either not fully captured or not captured at all under Pillar 1 such as credit concentration risk, pension risk and interest rate risk in the banking book.

For macroprudential purposes including targeting various sources of systemic risk, the risk-weighted capital framework is augmented by several capital buffers that sit on top of the minimum requirement. These buffers include, under Basel III, a capital conservation buffer (CCoB), a countercyclical capital buffer (CCyB) and a capital buffer for global systemically important banks (G-SIBs). While CCoB is designed to ensure that banks build up buffers outside periods of stress which can be drawn down as losses are incurred, CCyB is used to adjust the resilience of the banking system to the changing scale of risk that it faces over time. The G-SIB buffer in turn aims to reduce the probability of systemic banks failing or experiencing distress, in line with the increased adverse impact this would have on the global economy and financial system given their role and concentration in providing services globally, their interconnectedness and complexity.

Leverage ratio requirement

The objectives of the leverage ratio requirement are twofold. First, it complements the risk-based capital requirements by protecting against the uncertainty related to the measurement of the risk underlying banks' assets. Second, it can also restrict the build-up of excess leverage in the banking sector to avoid deleveraging processes that can damage the broader financial system and the economy.

This ratio is calculated as a capital measure divided by a total exposure measure. Under Basel III, banks are expected to maintain a Tier 1 leverage ratio in excess of 3%.
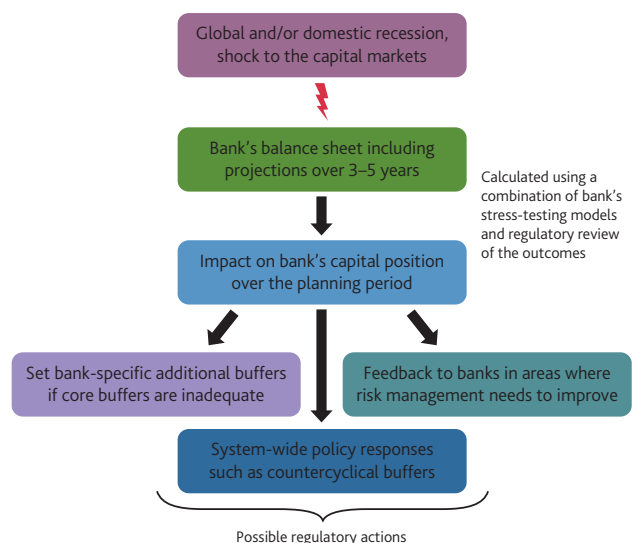
Stress testing

Banking stress tests examine the potential impact of an adverse scenario on the individual institutions that make up the banking system, and the system as a whole. This allows regulators to assess banks' resilience and make sure they have enough capital to withstand shocks, and to support the economy if a stress does materialise.

Stress tests generally start with the specification of hypothetical stress scenarios. A variety of different modelling techniques are then used to produce projections of banks' profitability and capital positions under these scenarios. Those results could be used for a number of purposes. Some authorities use them as a tool to highlight financial stability risks, while others use them as part of their approaches to setting capital requirements.[8]

In the UK, the PRA carries out stress testing concurrently for the seven largest UK deposit-takers. **Figure A1** below summarises the PRA's stress-testing approach.

Figure A1 Illustration of the use of stress-testing analysis by the PRA

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(8) For more detailed discussion on stress testing, see Dent, Westwood and Segoviano (2016).

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