

# **REAL-ECONOMY COST OF REGULATION IN THE SWEDISH BANKING SYSTEM**

**SWEDISH BANKERS' ASSOCIATION**

SEPTEMBER 2016

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# 1. Introduction

Over the coming years, banks will need to comply with a swathe of new regulations concerning capital, leverage, liquidity and business conduct. As with Basel II, which preceded the financial crisis, and with the regulations introduced in its immediate aftermath, these new rules aim to make the financial system more stable and to protect taxpayers from the cost of bailing out insolvent banks. Such regulations also bring costs - in the first instance, for the regulated banks, but in the longer term, potentially also for banks' customers and society more broadly. An assessment of proposed regulations must consider these costs, as well as the intended benefits.

Oliver Wyman was commissioned by the Swedish Bankers' Association to write a report on the implications of financial regulations for the Swedish economy. We have conducted a review of relevant research, and interpreted the findings in the context of the Swedish market. The purpose of this paper is not to make recommendations, but to inform policymakers and analysts about the way pending financial regulations are likely to affect the real economy. We focus on the effects of the rules already recommended by the Basel Committee on Banking Supervision or Finansinspektionen (the Swedish FSA). It is important to stress that our analysis is based on the best possible understanding of emerging regulations at the time of writing this report. Many of the regulations mentioned in this report are still being debated by regulatory bodies, and the final calibration has in many cases not yet been determined.

We conclude that:

- The reforms are likely to increase banks' cost of capital. Historically, the funding costs for banks have been reduced with increased capital requirements. However, this upside decreases the higher the capital requirements are. The additional costs for banks are likely to be passed on to the wider economy through higher prices for credit and reduced lending. This effect will not be uniform across classes of borrowers. Our analysis indicates that SMEs are likely to be hit especially hard.
- Regulatory requirements may effectively replace internal and rating agency measures in banks' capital allocation and pricing processes. Regulations now often demand more capital and liquidity than the quantities determined using other methodologies. This has implications for banks' risk measurement practices, as the discrepancy between regulatory requirements and internal views of risk widen. This divergence in views on risk may lead to the sub-optimisation of capital allocation, pricing, product development and other tools and processes related to risk management.
- Regulatory reforms could push an increasing amount of financial activity towards an unregulated "shadow banking" sector, with unclear consequences for systemic risk.
- New capital regulations will reduce incentives for providing low-risk lending. Risk-insensitive rules will incentivise banks to increase exposure to high-risk lending to maintain a reasonable risk-adjusted return. This is mainly caused by the increased capital cost for assets hit by the capital floors (see Section 3), which is not incorporated in current pricing. This may put institutions' risk management organisations under pressure as the incentives for higher-risk lending increases.

In this report, we begin by comparing the capitalisation of Swedish banks with their European peers. We then describe the most significant of the forthcoming regulations and estimate their implications for the capital requirements of Swedish banks (Sections 3 and 4). Banks have several options for increasing their capital ratios in response to these

regulations, and we consider these in Section 5. Finally, we consider the costs that will flow through to borrowers and the implications for the wider economy.

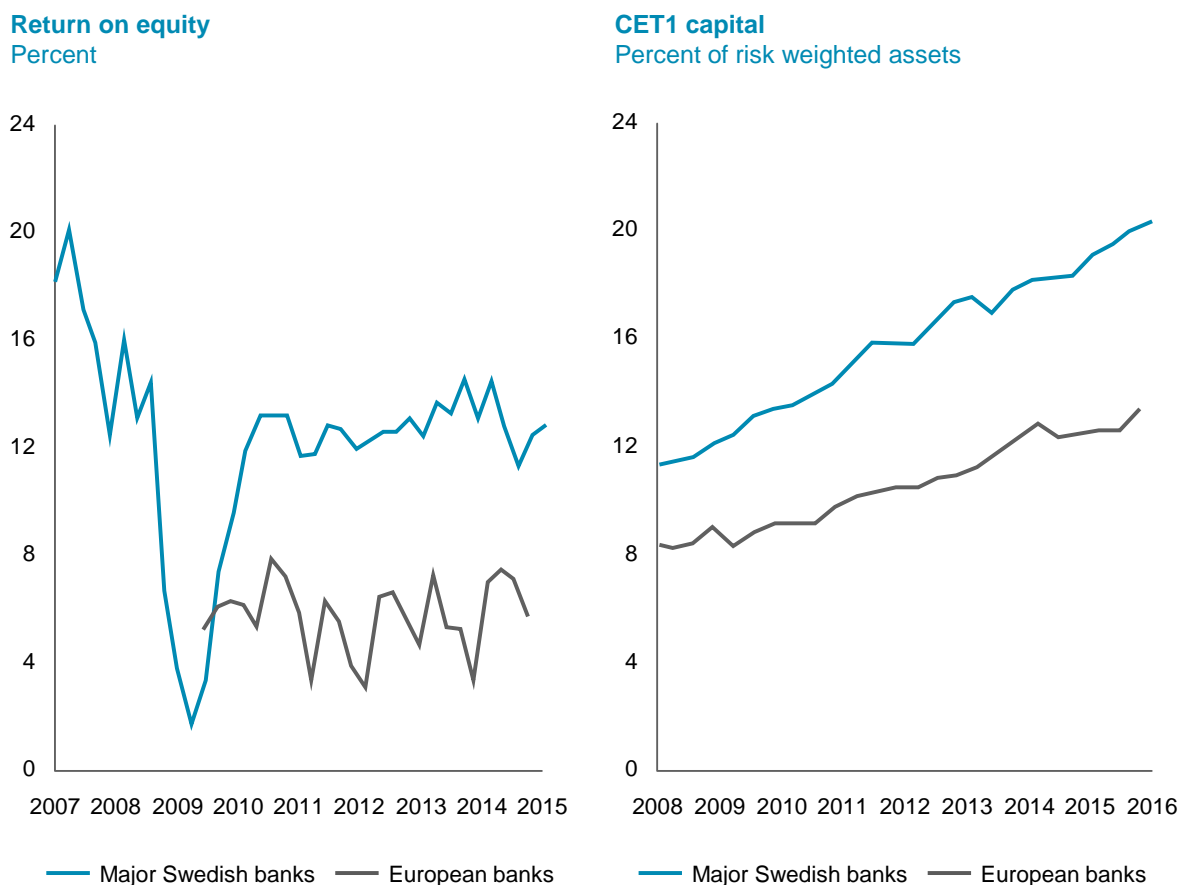
## 2. How the Swedish banking system compares to the rest of Europe

Before discussing the implications of emerging banking regulation, we outline in this section some key differentiators between the Swedish banking system and the banking system in other European countries.

Firstly, Sweden is a small economy with a single currency and large banking system relative to GDP. This makes Sweden vulnerable, and as a result, the Swedish regulator has been at the forefront of implementing post-crisis regulations. In several cases, it has applied regulations more stringently than other European countries. Examples include the Swedish resolution fee, which is among the highest in Europe, Swedish liquidity rules (LCR), which are more strictly calibrated than in most other countries, and the deposit guarantee fee, which is high in comparison to other countries.

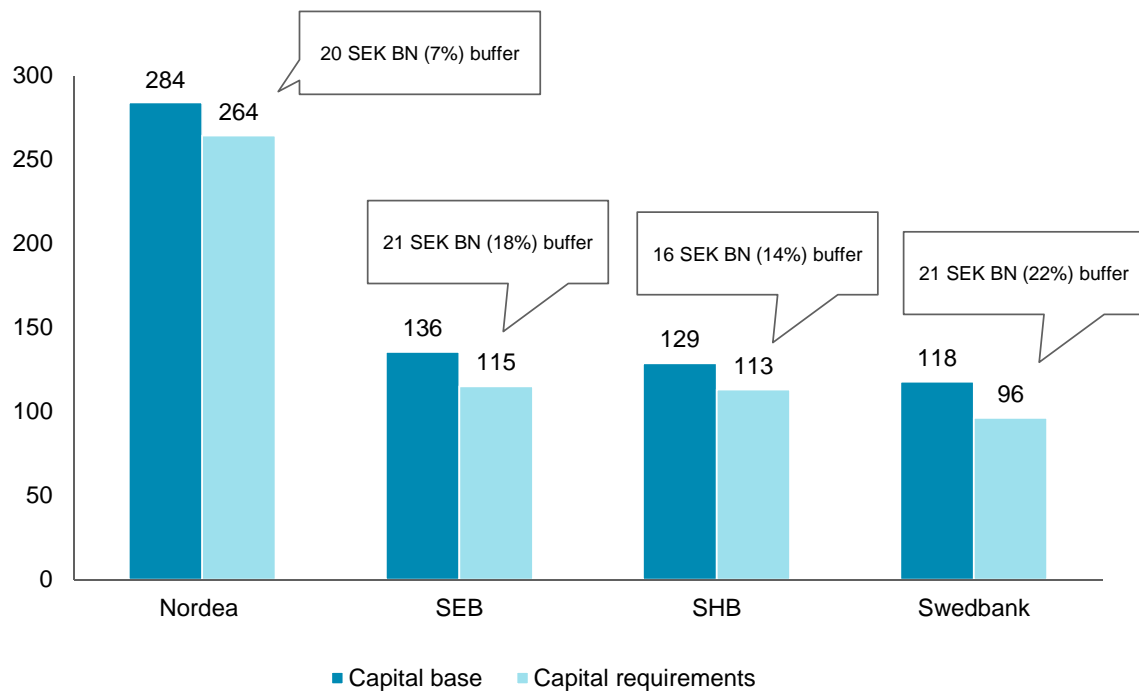
Furthermore – and to some extent as a result of more stringent calibration of capital regulations – the Swedish banking system is more capitalised than the European average. Despite this, Swedish banks deliver higher rates of return on equity (RoE) (see figures below).

**Figure 2.1:** Average Capital Ratios and RoEs of Swedish Banks Compared with European Averages



Source: Finansinspektionen

**Figure 2.2:** Capital base and capital requirements for the four major Swedish banks  
*Total capital, 2015 (SEK BN)*



Source: Finansinspektionen

Another distinct characteristic of the Swedish banking system is that risk weights of Swedish banks are low in comparison with the European average, a situation mainly caused by:

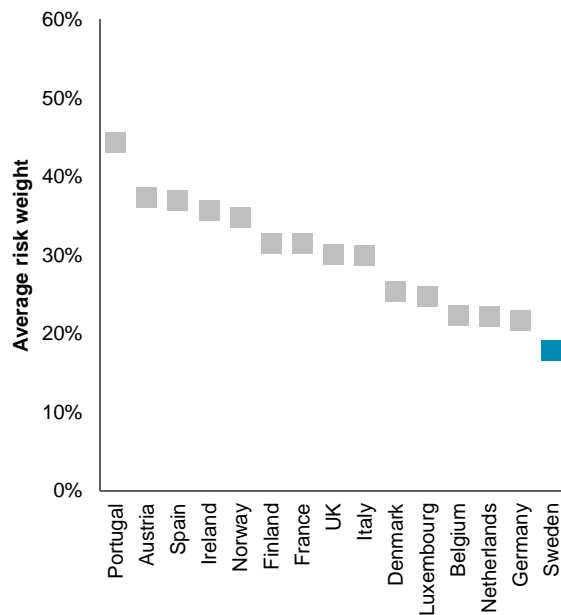
- Low default rates historically
- Higher proportion of assets covered by the internal ratings-based (IRB) approach, mainly due to early adoption of Basel II (see Box 1)
- Sweden's legal system, business environment and governance structure which makes it easier to recover losses from loans in default<sup>1</sup>
- More exposure (in relative terms) to corporates, SMEs and real estate (i.e., "vanilla products"), and less to specialised lending and securitisations

<sup>1</sup> Sweden ranks high in international studies in terms of stability of its legal system, business environment and governance structure. For example, Sweden ranked 3<sup>rd</sup> in the EU in World Bank's Governance indicator rankings, 4<sup>th</sup> in the EU in the World Economic Forum's World Competitiveness Rankings, 2<sup>nd</sup> in the EU in the World Justice Project's Rule of Law Index<sup>1</sup> and 1<sup>st</sup> in the EU in the Social Progress Imperative's Social Progress Index

**Figure 2.3: Average Risk Weights and NPLs by country**

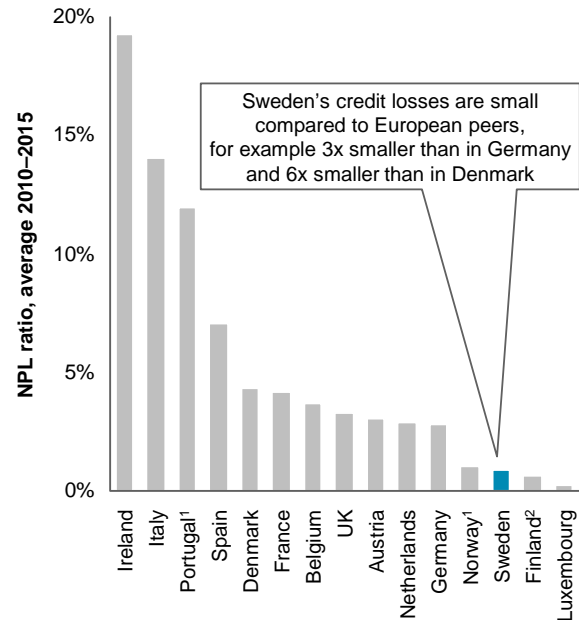
**Average risk weights**

2015, by country (excl. Swedish 25% mortgage floor)



**Average NPL ratio by country**

Five year average, 2010–2015



1. 2015 NPL data

2. 2014 NPL data

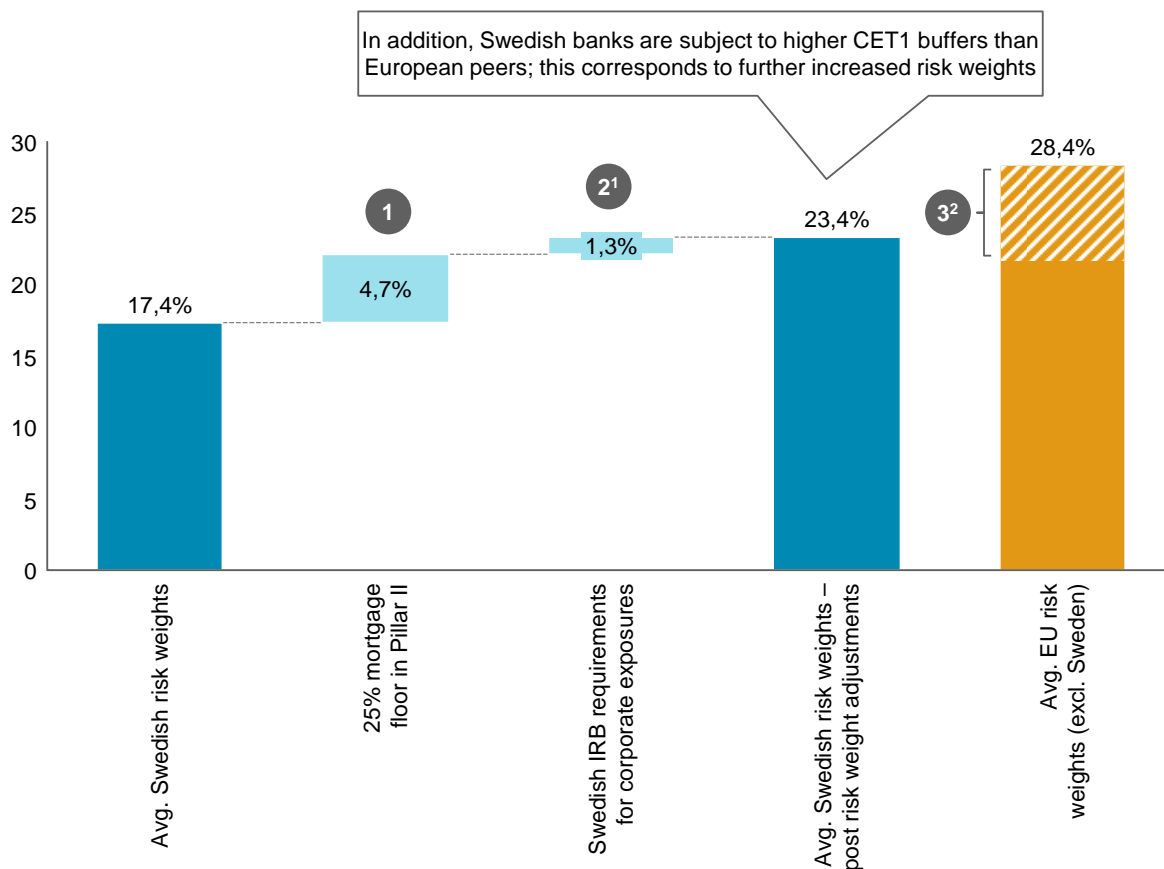
Source: ECB, IMF, EBA stress test data June 2015 data, Oliver Wyman analysis

Given these distinctive features of the Swedish banking sector, the risk weights of Swedish banks are not directly comparable to the rest of Europe. To improve comparability, we have adjusted for three kinds of effects in the examples below:

	Effects on risk weights	Description
1	<b>Swedish mortgage floors</b>	The Swedish regulator has prescribed a 25% risk weight floor for mortgages in Pillar II. This requirement is specific to the Swedish market, which makes comparisons to other European markets difficult. We estimate the corresponding risk weight impact to be approximately 4.7 percentage points.
2	<b>Swedish IRB rules for corporates</b>	The Swedish regulator has prescribed specific IRB rules relating to the calculation of the probability of default (PD) and maturity for corporates. We estimate the corresponding risk weight impact to be ~1.3% percentage points.
3	<b>Higher IRB model usage in Sweden</b>	Swedish banks have higher usage of internal models compared to European peers (mainly due to early adoption of Basel II). We estimate that if IRB usage among European banks was in line with Sweden, this would reduce risk weights for European banks by around 3 to 6 percentage points.



**Figure 2.4:** Swedish Risk Weights Adjusted for Structural Divergences from European Norms



1. Risk weight adjustment for banks with lower than 30% risk weights for corporates (SHB is the only bank impacted)

2. If IRB usage in Europe was in line with Sweden, average risk weights for European banks would be in the range of 23% - 26%

Source: EBA June 2015 stress test data, Oliver Wyman analysis

While these adjustments are unavoidably crude, they indicate that with a more comparable evaluation, risk weights in Swedish banks are more in line with the rest of Europe. It should also be noted that:

- Swedish banks have more exposure to corporates, SMEs and real estate in relative terms, and less exposure to specialised lending and securitisation. This is an explanatory factor for lower risk weights in Sweden, which we have not taken into account in the calculation above.
- In addition, the Swedish regulator has prescribed higher CET1 buffers in Sweden compared to other countries. This could be seen as another increase in “true” risk weights, which we also have not taken into account in the calculation above.

### Box 1: Risk Weighted Assets

Under the Basel framework, banks are required to hold capital as a buffer against losses arising from their exposures. The riskier a bank's position, the more capital it must hold. This link between risk and capital is achieved by requiring banks to hold Common Equity Tier 1 capital (CET1) in a constant proportion, not of nominal assets but of "risk weighted assets" (RWAs). The bare minimum ratio of CET1 to RWAs is 6%, but most regulators require banks to hold additional buffers.

Assets can be risk weighted in two ways. The bank can apply standard weights specified by the Basel Committee on Bank Supervision (BCBS). These vary with the type of borrower or collateral and, where available, with external agency ratings (for government and corporate bonds). Alternatively, banks can follow an IRB approach, whereby risk weights are assigned on the basis of the bank's "in-house" modelling of its borrowers' probability of defaulting. This is the approach taken by most banks in advanced markets – at least, for many of their assets.

Banks following the IRB approach usually have lower average risk weights – and, hence, lower capital ratios (against nominal assets) – than banks using the standardised approach. Because the standardised approach is, by definition, one-size-fits-all, the standardised weights must be large enough to cover banks with the riskiest assets within any class. It is therefore unsurprising that risk weights calculated in house (IRB RWAs) should be lower on average than the standardised weights.

Finally, the Swedish financial system is prone to a number of risks that are specific to the local market. Some analysts highlight the Swedish housing market as a source of potential future financial collapse. House prices have risen rapidly in recent years, and consequently a number of regulations have been introduced. A mortgage cap was put in place by the Swedish FSA in 2010, followed by 25% risk weight floors for mortgages in 2015 (an increase from 15%), and new amortisation rules in 2016.

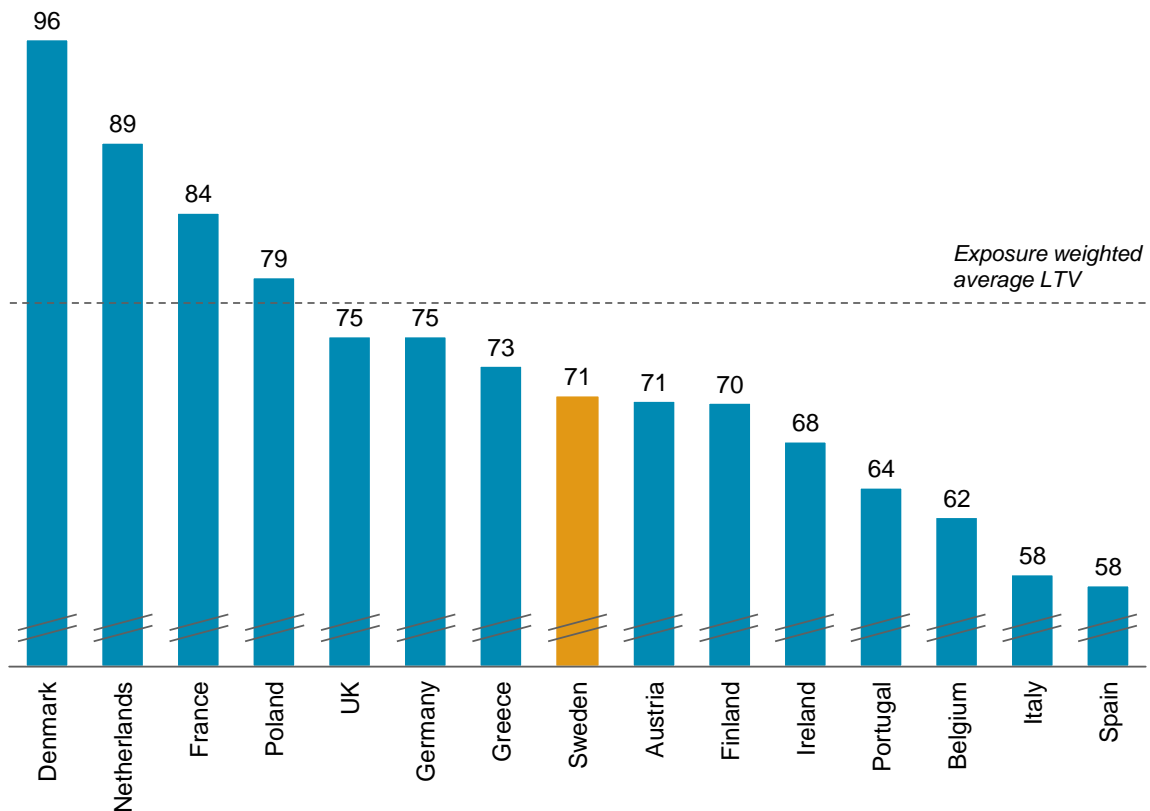
In its 2016 report of the Swedish mortgage market, Finansinspektionen concluded that the mortgage cap has dampened household indebtedness, and that the number of amortising households is increasing. In 2011, 44% of households with new loans amortised. In 2015, the corresponding number was 67%.<sup>2</sup>

The figure below outlines loan-to-value (LTV) ratios for new retail real estate loans in major European countries, estimated by The European Systemic Risk Board in 2015. The average exposure-weighted LTV ratio across these countries is 77% for new loans. The corresponding ratio for Sweden is 71%, i.e., slightly below average. (Note that Finansinspektionen, in their report "The Swedish Mortgage Market", estimated that LTV ratios for new loans in Sweden in 2015 were at 65%.

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<sup>2</sup> Finansinspektionen (2016), "The Swedish Mortgage Market"

**Figure 2.5:** Average LTV ratios for newly issued residential mortgages for major EU countries (%)




Source: European Systemic Risk Board: Report on residential real estate and financial stability in the EU (2015)

### 3. Overview of emerging regulations

Since 2009, the BCBS has been leading the global effort to overhaul banking regulation and increase banks' capital and liquidity levels. The most significant of these regulatory changes are listed below:

**Examples of key emerging regulations (not exhaustive)**

<b>Impacted area</b>	<b>Regulation</b>
<b>Core capital requirements</b>	Regulatory buffers (capital conservation buffer and countercyclical buffer)
	Leverage ratio
<b>RWA requirements</b>	Standardised approach for credit risk
	Revised approach for operational risk
	Fundamental review of the trading book (FRTB)
	Revised IRB approach
	Capital floors
	Interest rate risk in the banking book (IRRBB)
	25% Pillar II mortgage floor
	2.5 year maturity floor for corporates
	Revised approach for corporate PD estimation
	IRB treatment of sovereign exposures
<b>Liquidity requirements</b>	Net stable funding ratio (NSFR)
<b>Provisioning</b>	IFRS 9
<b>Recovery and resolution planning</b>	Minimum requirement for own funds and eligible liabilities (MREL)
	Total Loss Absorbing Capacity (TLAC)

 Regulations specific to Sweden

The new requirements represent major changes to the global financial system. The regulatory texts run to thousands of pages, including many technical calculations. Given their number and complexity, some researchers and policymakers highlight the risk of duplication and harmful interactions between rules, and errors in some of the prescribed calculations or parameter calibrations.<sup>3</sup> While individual regulations may seem effective in isolation, we believe that in order to make the calibration of regulations effective from a broader economic perspective, it is important to understand the implications of the combined and cumulative effect of all regulations that impact financial institutions.

Of the many pending regulations, we expect the regulations related to capital and RWA requirements to have the greatest impact on Swedish banks. While new liquidity and conduct rules may require banks to make major changes to the way they operate, capital requirements will be far more costly for banks. And, as we explain in Section 5, these regulations will have a material effect on retail and wholesale bank customers, by increasing the cost of borrowing. Firstly, however, we must describe the relevant regulations.

<sup>3</sup> Oliver Wyman (2016), "Interaction, coherence, and overall calibration of post Basel reforms"

### 3.1. Capital Floors

Aiming to ensure that the banking system is adequately capitalised and to “enhance the comparability of capital outcomes across banks”,<sup>4</sup> the BCBS plans to introduce “capital floors”. Capital floors will establish minimum risk weights for assets for banks using the IRB approach. These minima will be defined as a percentage of the weights used for the standardised approach (see Box 1). For example, the standardised risk weight for a loan secured against a residential property is 35%. If the BCBS sets the capital floor at 75%, the minimum risk weight for such a loan will be 26% when using the IRB approach. The risk weight derived from internal modelling of the risk will apply only when it is higher than this minimum.

The percentage of standard weights to be used (75% in our hypothetical example) has not yet been decided, but the BCBS has indicated that it will be between 60% and 90%.

Because risk weights derived by the IRB approach tend to be below the standardised weights, capital floors will be a less risk-sensitive measure than banks’ current internal assessments of risk. Depending on the final definition of the measure, this may incentivise banks to take on more high-risk lending. This is because those kinds of loans might provide a better risk-adjusted return, as the capital requirement is the same as for less risky assets that are hit by the capital floor.

### 3.2. TLAC and MREL

During the financial crisis that began in 2008, banks in the United States and Europe were sustained with injections of capital supplied by taxpayers. To avoid such bail-outs, regulators seek to ensure that future banks’ liabilities have sufficient loss-absorbing capacity to be recapitalised without a call on taxpayers’ funds. In other words, they want to replace bail-outs with “bail-ins”. The Total Loss Absorbing Capacity (TLAC) regulations of the BCBS and the Minimum Requirement for Own Funds and Eligible Liabilities (MREL) of the European Banking Authority are overlapping attempts to achieve this goal. In addition to demanding the regulatory capital minima, they require banks’ liabilities to include a certain percentage of “bail-in-able” debt. These changes to the debt instruments and the obligations of the debt holders will also affect the price of banks’ debt issuance, and hence the total funding costs.

Although the capital floors and MREL are separate regulations arising from separate authorities, their implications for banks are linked. The way the MREL proposal is currently designed, MREL requirements will go up when capital requirements go up. The combined effect of MREL and capital floors may therefore have a significant impact on Swedish banks if the capital floor calibration comes in at a high level.

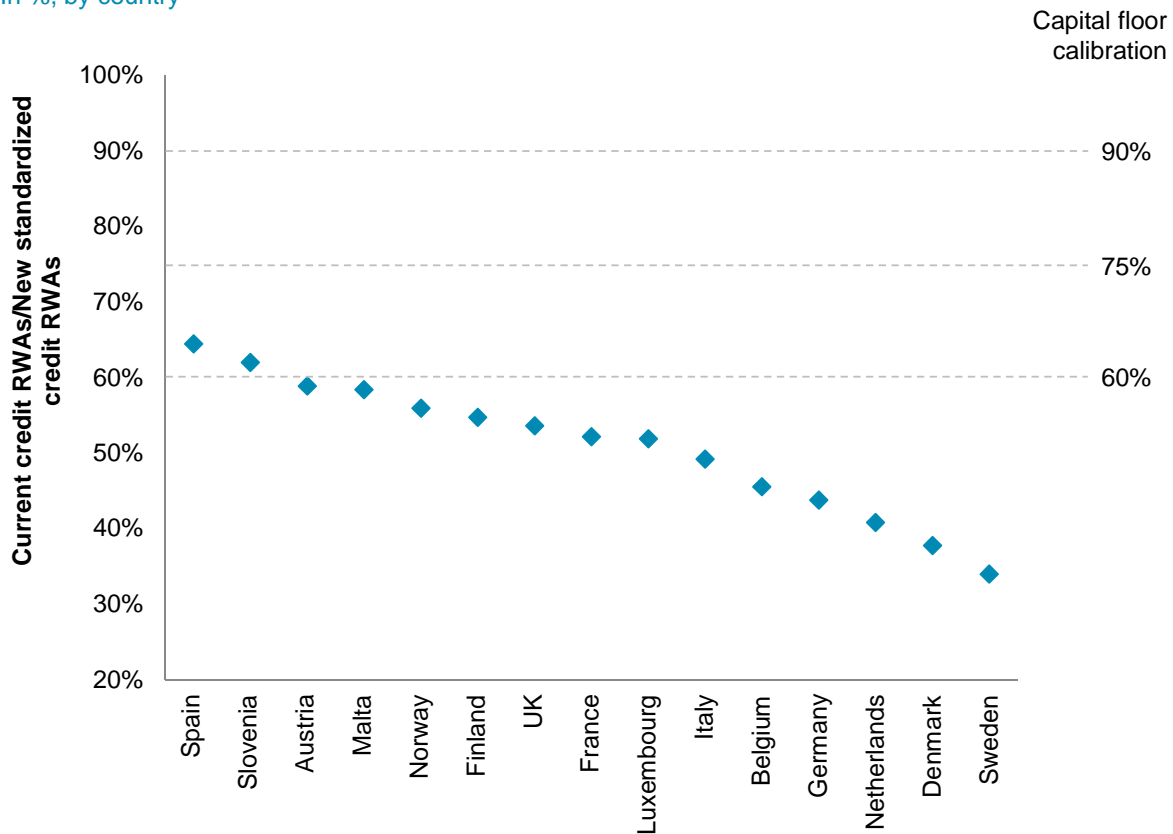
## 4. Capital implications for Swedish banks

The introduction of capital floors can only increase the capital requirements of banks using the IRB approach. The size of the increase will, of course, depend on the percentage of standard weights (henceforth, the “capital floor calibration”) chosen by the BCBS, and the current gap between a bank’s RWAs using the IRB approach and the RWAs it would have if it used only standard weights. As Figure 4.1 shows, this gap is especially large for Swedish banks, the largest among European countries.

<sup>4</sup> Basel Committee for Banking Supervision (2014), “Capital Floors: The Design of a Framework based on Standardised Approaches”

**Figure 4.1:** Credit RWAs divided by standardised credit RWAs

**Credit RWAs over new standardized credit RWAs (excl. Swedish 25% mortgage floor)**  
In %, by country



Source: EBA stress test data June 2015 data

Note: RWA% estimates used for new standardised risk weights: sovereigns: 5%, banks 40%, corporates 85%, retail secured by real estate 35%, other retail 75%, Equity 250%, Securitization 100%, Other non credit-obligation assets 100%

Because Swedish banks' RWAs are now well below the standardised RWAs, the capital floors will entail large increases in the capital they are required to hold. The increase will depend on the calibration ultimately chosen by the BCBS. Since they have indicated that it will fall between 60% and 90%, we have modelled the capital implications at the low end (60%), the mid-point (75%) and the high end (90%).

Under the current regime, the four largest Swedish banks are required to hold SEK 467 BN of Common Equity Tier 1 (CET1) capital (SEK 589 BN in total capital).<sup>5</sup> The type of capital instruments required is not specified in the BCBS consultative document on capital floors. As most capital requirements are defined in terms of CET1 capital, we assume that the capital floor will impact the CET1 capital requirement for the purposes of this report. On our three scenarios for the capital floor calibration, the CET1 capital requirement would increase by between SEK 125 BN and SEK 365 BN - that is, by between 27% and 78%.<sup>6</sup> The mid-point of this range corresponds to an increase in CET1 requirements from ~17% today to ~26%

<sup>5</sup> The capital requirement is split in three tiers - CET1, Additional Tier 1 and Tier 2 – and each tier is defined to include different capital instruments. E.g. CET1 includes, amongst other instruments, common shares issued by the bank and retained earnings

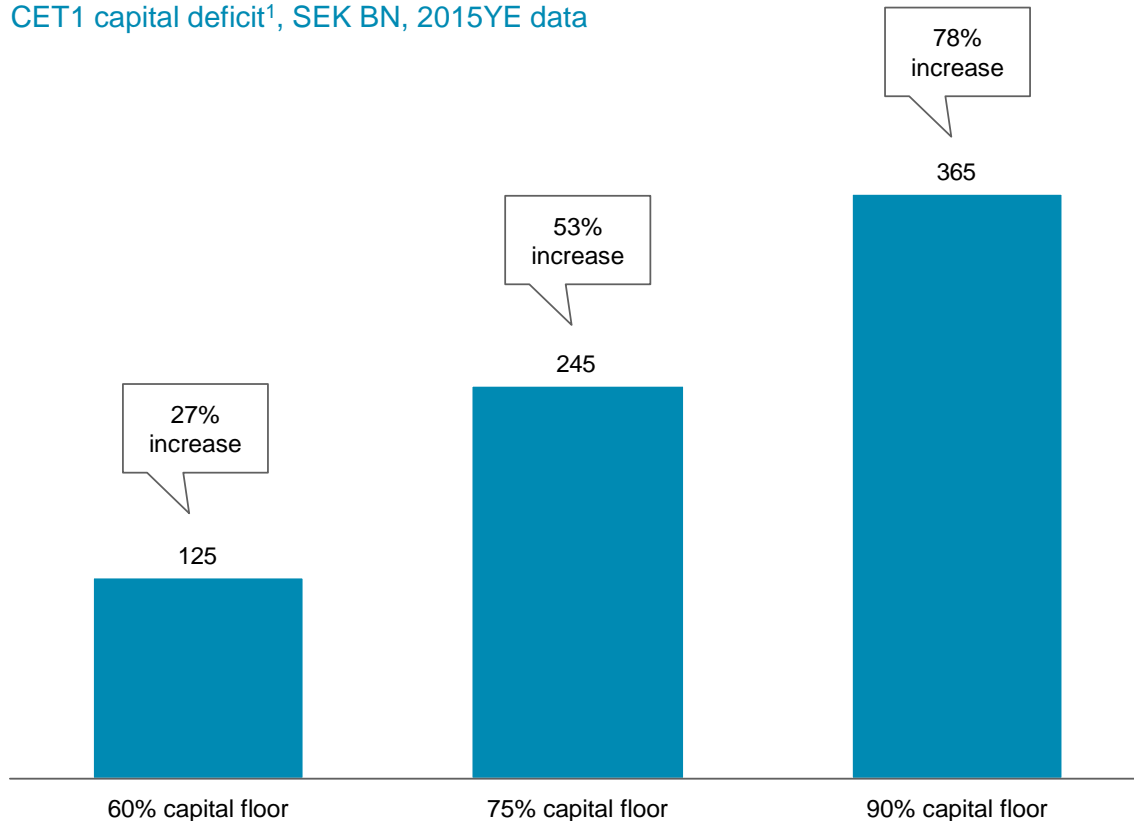
<sup>6</sup> Increased capital requirements were modelled for Sweden's four largest banks – Handelsbanken, Nordea, SEB and Swedbank

after implementation of capital floors (note that the ~26% estimate assumes that the existing mortgage floor in Sweden will be replaced by new standardised rules for credit risk).

**Figure 4.2:** Increase in regulatory capital requirements created by capital floors

### Impact of credit risk capital floors

CET1 capital deficit<sup>1</sup>, SEK BN, 2015YE data

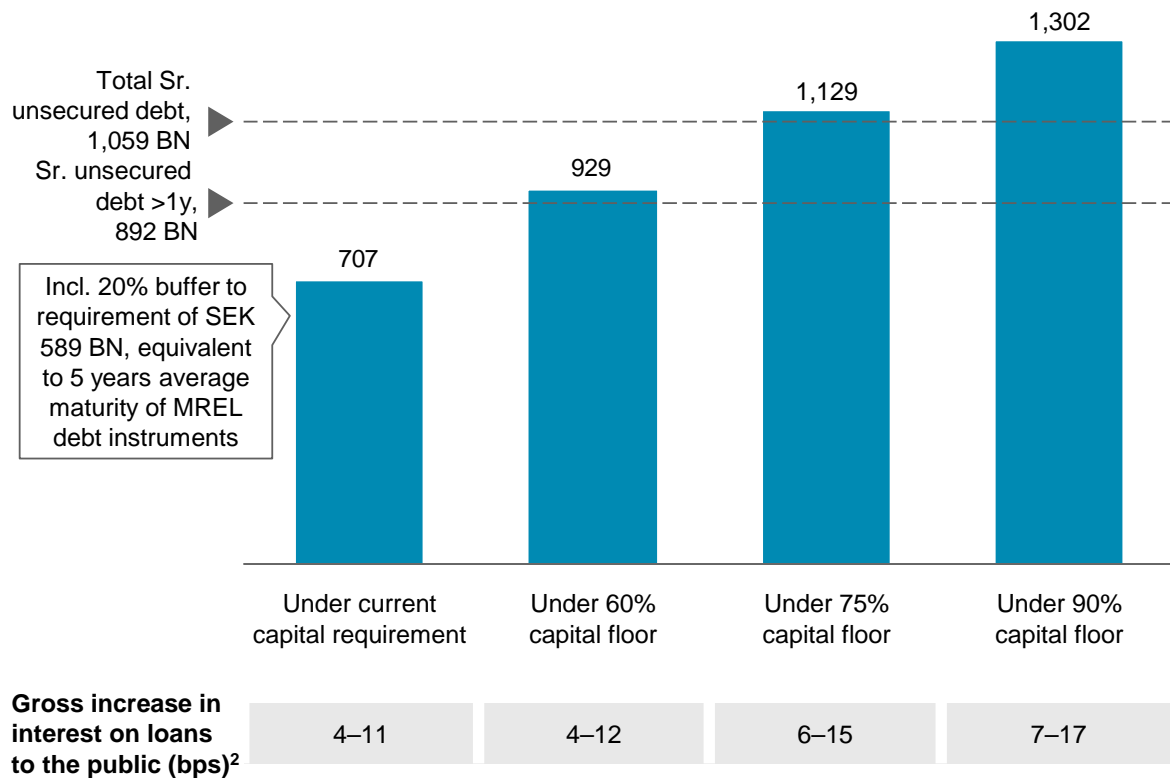


1. Aggregation of Handelsbanken, Nordea, SEB, and Swedbank  
Source: Pillar 3 reports, Oliver Wyman analysis

The four largest Swedish banks now have SEK 60 BN of CET1 capital over and above their SEK 467 BN regulatory CET1 requirement. This can in theory be put towards their new regulatory requirements, meaning that they will need to somehow increase their capital by SEK 65 BN to SEK 305 BN (assuming no reduction in assets).<sup>7</sup>

Before considering the ways in which Swedish banks might increase their capital ratios, and the implications for the Swedish economy, it is worth noting that the capital floors are likely to entail a shortfall of unsecured, “bail-in-able” debt under MREL. At the 90% calibration, all of the four big banks would need to increase the percentage of their liabilities that are senior unsecured debt (in the current MREL proposal).

<sup>7</sup> In reality, banks will hold an additional capital cushion over and above the regulatory minimum

**Figure 4.3: MREL requirements by scenario, SEK BN****MREL requirement by scenario<sup>1</sup>, SEK BN**

1. Aggregate requirement for Nordea, SEB, SHB and Swedbank. Capital floor scenarios are based on LTV at origination  
 2. 40–100 bps funding cost increase, based on spreads between subordinated and senior unsecured debt. The gross increase will be mitigated by decreasing cost of Sr. Unsecured debt instruments (if enough instruments in issue)  
 Sources: Finansinspektionen, Bank annual reports, Moody's, Oliver Wyman analysis

The scale of the required switch to senior unsecured debt is made uncertain not only by the still unconfirmed capital floor calibration, but by pending decisions regarding the treatment of various liabilities for MREL purposes. It is not yet certain whether MREL-eligible liabilities will need to be subordinate to all other liabilities, or which types of liability, such as corporate deposits, will qualify. Because subordinated debt is more expensive than secured and unsecured debt, this will entail an overall increase in the cost of funding of between 4 and 17 basis points, which, over the long run, will be passed on to bank customers (see Figure 4.3 above).

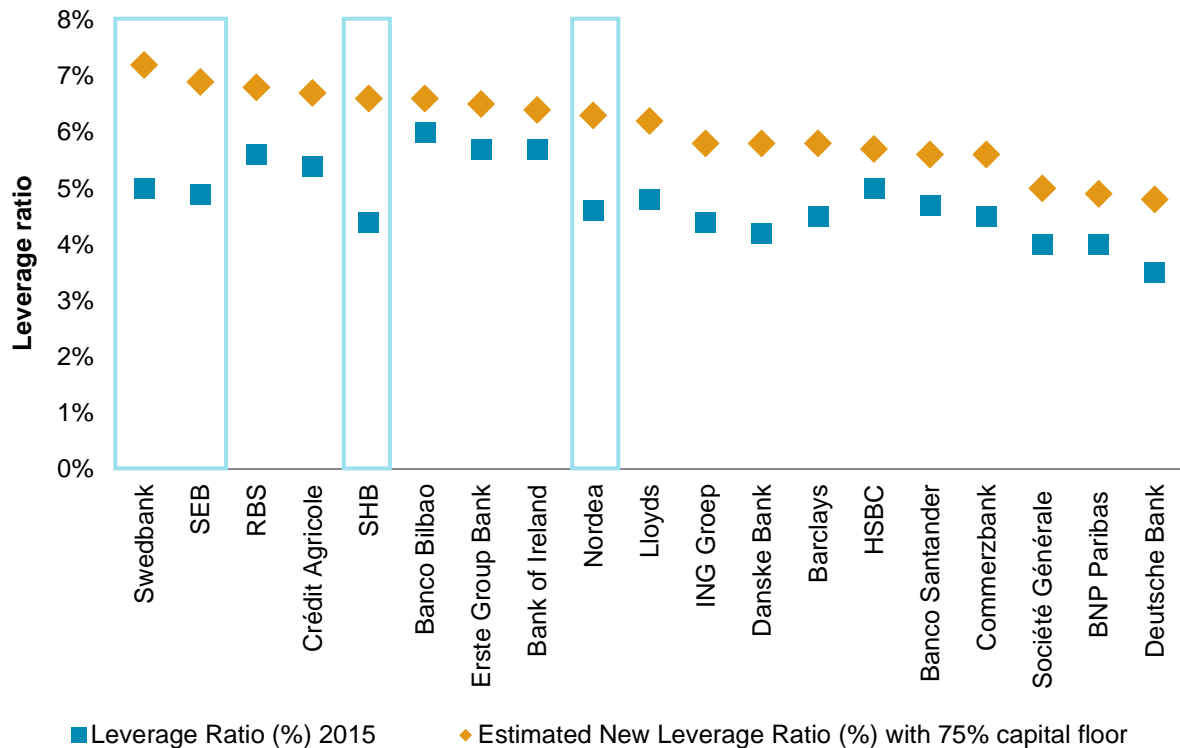
Whereas the capital floors will increase the impact of the MREL requirements, they are likely to render irrelevant in Sweden the separately proposed and supplementary minimum capital requirement - the leverage ratio. The leverage ratio (the ratio of high-quality capital to assets) is intended to be a simple, transparent and non-risk-based measure calibrated to act as a credible supplementary measure to the risk-based requirements of Basel III. The capital floors alone will require Swedish banks to hold a quantity of capital in relation to nominal assets that will give them a leverage ratio in excess of the regulatory minimum. The minimum leverage ratio will only affect the amount of capital Swedish banks must hold if the leverage ratio is greater than 5% in a 60% capital floor calibration scenario. In the 75% capital floor scenario, the minimum leverage ratio would need to be set to at least 6% to have any impact. In the 90% scenario, it must be at least 7%.



Capital floors calibrated to 75% will increase the leverage ratios of Swedish banks from about 4% to 6–7%, shifting them away from the European average to place them among the highest (see figure below).

**Figure 4.4:** Leverage ratios of selected European banks

**Current and expected leverage ratio<sup>1</sup> (%)**



1. Increase in RWA based on a 75% capital floor scenario after revaluation to revised standardised approach. Reported total leverage exposure for 2015 is kept constant (i.e. static balance sheet assumed)  
 Source: EBA stress test data June 2015 data, SNL, Pillar 3 reports for Handelsbanken, Nordea, SEB, and Swedbank, Oliver Wyman analysis

## 5. How will Swedish banks increase their capital ratios?

As noted, the capital floors will require Swedish banks to increase their capital ratios by between 27% and 78%, depending on the final calibration. They can achieve this in four ways:

- A. Raise new equity
- B. Increase interest rates on lending
- C. Reduce lending volumes
- D. Reduce dividend payouts

These measures are not mutually exclusive. On the contrary, they are likely to go together. If interest rates increase, demand for borrowing will decline, everything else being equal.

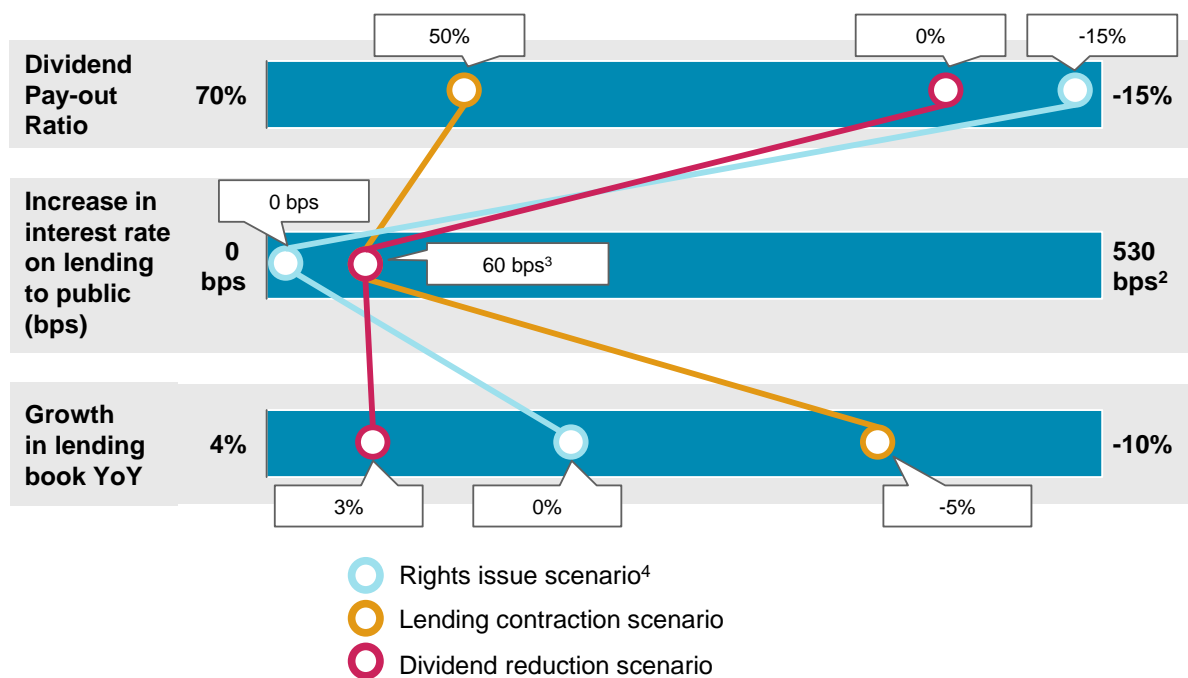
Similarly, if banks reduce their lending volumes, achieving the same rate of return on their unreduced capital will require higher pricing (see Section 6). In other words, if the ratio of capital to assets increases, the return on assets must increase to maintain a constant return on capital.

These four measures could, in theory, be combined in an infinite number of possible permutations. In practice, however, it would be difficult to rely on just one of them. For example, even if Swedish banks paid no dividends for three years (an unlikely scenario) and held their assets constant, they would still fall short of their capital requirements on the 75% calibration. Note that the actual transition period may be both shorter or longer than three years - our calculated examples use a three-year scenario as an example. Figure 5.1 shows three scenarios which would deliver the required increase in capital ratios over a three-year period, assuming the 75% calibration.

**Figure 5.1:** 3-year scenarios for increasing capital

### 3 year YoY scenario analysis

Range of options that the bank can combine to recapitalise<sup>1</sup>



1. Assumptions: 75% capital floor calibration and a capital shortfall of SEK 245 BN [for SHB, Nordea, SEB, and Swedbank], post-tax ROE return of 12% as today and the interest rate increase is to generate additional return to meet capital requirements  
 2. 530 bps corresponds to a 70% dividend pay-out ratio and 4% growth YoY as today  
 3. 60 bps corresponds to maintain a ~12% ROE once recapitalised (see Figure 6.1)  
 4. Equity issuance approximated by negative dividend pay-out ratio  
 Source: Oliver Wyman analysis

All scenarios that increase Swedish banks' capital ratios within a three-year transition period will have a major impact on shareholders and customers. Finansinspektionen could reduce this impact by extending the time frame within which Swedish banks must comply, or by reducing the 5% (of RWAs) systemic risk capital buffer<sup>8</sup> that it now requires the major Swedish banks to hold. Reducing the systemic risk buffer to 1% (which is in line with many

<sup>8</sup> Additional buffer requirements for systematically important banks

European countries), would free up SEK 110 BN of CET1 capital for the four largest Swedish banks.

## 6. Implications of new financial regulations on the real economy

Banking crises not only impose losses on the shareholders and creditors (or the taxpayers in the case of bail-outs). They also reduce aggregate output. At a macro-economic level, the cost of a banking crisis can be measured by the GDP forgone in the years following it. And the benefit of macro-prudential regulations is the degree to which they reduce the probability or the severity of such crisis-induced GDP losses.

However, such regulations also come at a cost. Over the long run, the extra capital costs imposed on banks will be passed on to borrowers. But it is not only borrowers who will feel the cost. As credit becomes more expensive, demand for borrowing will fall, reducing aggregate consumption and investment and, thereby, slowing economic growth and potentially reducing GDP. Unintentionally, these regulations will counteract the stimulus policies being pursued by monetary policy.

With diminishing returns (in terms of systemic stability) from additional regulatory burdens, and increasing costs (in terms of reduced investment and consumption), the cost of additional regulatory burdens will at some point exceed their benefit.

Much research has been conducted on the costs and benefits of financial regulations, some of it aiming to determine the optimal level of bank capitalisation (see Box 2). In the rest of this section, we aim to contribute to these efforts by estimating the costs that the new capital regulations will impose on Swedish borrowers – costs which, as we will see, vary between and within classes of borrower.

**Box 2: Academic research on costs and benefits of financial regulations**

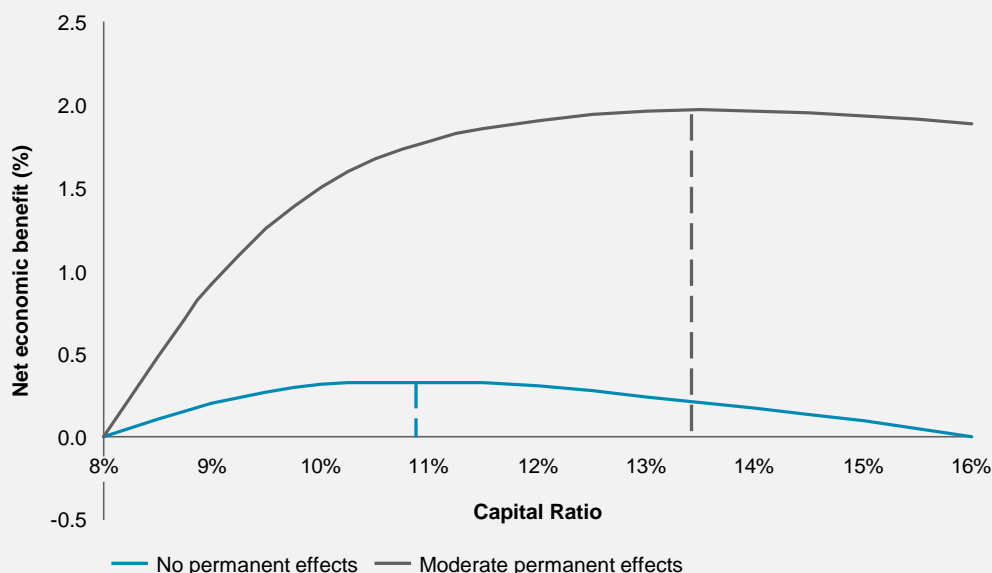
Several public and private organisations have researched the implications of regulations on society.

**Basel Committee on Banking Supervision, August 2010**

In 2010, BCBS released a paper in which they estimated the long-term net benefits of their regulatory reforms, based on a literature study.<sup>9</sup> They found that while increasing capital and liquidity requirements reduces the probability of banking crises, it has diminishing marginal value. The further banks are from insolvency, the lower the marginal benefit of additional capital or liquidity.

The findings are summarised in the figure below. Net benefits are measured by the difference between expected benefits and expected costs, driven by GDP impact, for example. Based on their literature study, capital requirements above ~11% or above ~13% (depending on methodology) yield net costs.

**Long-run expected annual net economic benefit**



**Bank of International Settlements (BIS), 2011**

A study published by BIS found that the optimal level of bank capitalisation is in the range of 10–15% of RWAs.<sup>10</sup> Requirements above this level seem to have negative net effects on the economy.

**Independent Commission of Banking, September 2011**

The Independent Commission on Banking released a paper, known as the Vickers report, with recommendations on reforms to improve stability and competition in the UK banking industry. The Commission used previous historical examples of banking crises to determine the amount of loss-absorbing capacity which it thought was needed. The Commission recommended that both the retail and other activities of large UK banking groups should have primary loss-absorbing capacity of at least 17–20%. They found that: “Primary loss absorbing capacity of 17% of RWAs would have been sufficient to cover nearly all of the loss-making banks [in the current and previous crises].”

<sup>9</sup> Basel Committee on Banking Supervision (2010), “An assessment of the long-term economic impact of stronger capital and liquidity requirements”.

<sup>10</sup> Bank for International Settlements: Schanz, Jochen, Aikman, David, Collazos, Paul, Farag, Marc, Gregory, David and Kapadia, Sujit (2011), “The long-term economic impact of higher capital levels”

**International Monetary Fund (IMF), 2016**

The IMF released a Staff Discussion Note in 2016<sup>11</sup>, which concluded that capital in the range of 15% – 23% of risk-weighted assets would have been sufficient to absorb losses in the majority of past banking crises, at least in advanced economies. Further capital increases would only have had marginal effects on preventing additional crises, suggesting that this level of loss-absorption capacity is, on average, appropriate for advanced economies.

**Miles et al., 2012**

David Miles et al. released a paper in The Economic Journal in 2012,<sup>12</sup> estimating the long-run costs and benefits of different bank capital levels. They found that the point at which benefits of more capital fell below costs was around 16% to 20% of RWAs.

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<sup>11</sup> Jihad Dagher, Giovanni Dell’Ariccia, Luc Laeven, Lev Ratnovski, and Hui Tong (2016), “Benefits and Costs of Bank Capital”

<sup>12</sup> David Miles, Jing Yang and Gilberto Marcheggiano (2012), “Optimal bank capital”

As noted in Section 5, reducing returns to shareholders may be an option for banks making a short-term adjustment to new capital requirements. Over the long term, however, unless returns to shareholders are at, or above, the levels of firms with similar return volatility, capital will eventually flow out of the sector. This would result in a shrinking of the financial sector, and produce adverse consequences for the economy.<sup>13</sup> Furthermore, if profitability in the sector is too low, it will be difficult for banks to raise capital in case of stress. For institutions to be able to depend on shareholders to provide capital, the shareholders will expect a reasonable return. As such, since the cost of higher industry-wide capital requirements will not ultimately be borne by shareholders, it must be borne by bank customers.

More specifically, the cost must be borne by people who borrow from banks. It may seem that banks could increase returns by charging more for any of their services, such as deposit taking and payments, and not just lending. However, such an idea would not work out well in practice. A bank that cross-subsidises expensive lending products by adding a price premium to other products will lose customers for those products to competitors who do not practise the same cross-subsidisation. This is the mechanism which, in competitive markets, makes product prices correspond – more or less, and over the long run – to their individual production costs (including the cost of capital). And, as this theory predicts, banks are becoming much better at internally allocating capital and liquidity costs to products when setting their prices.

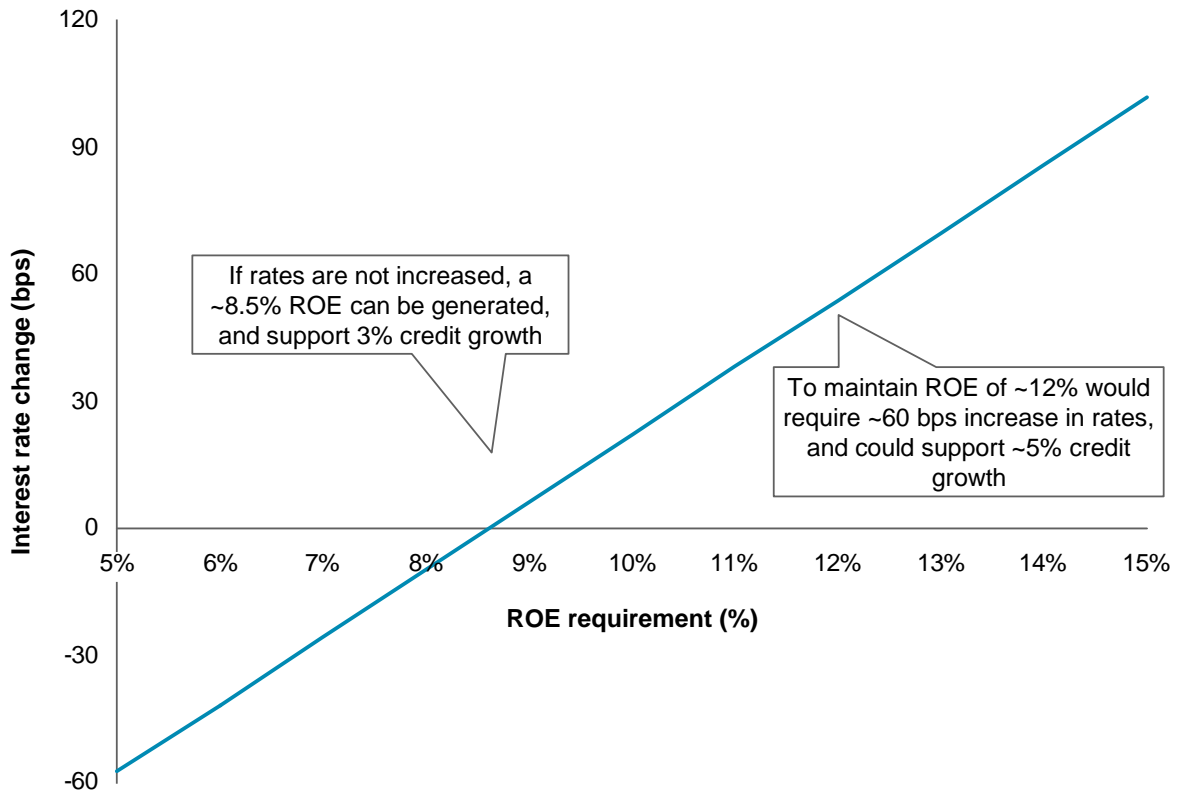
Figure 6.1 shows the average change in interest rates charged to borrowers required to deliver any RoE between 5% and 15%, assuming a 75% capital floor calibration. To sustain the current 12% expected RoE, interest rates would need to rise by 60 basis points.

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<sup>13</sup> Oliver Wyman (2016), “Interaction, coherence, and overall calibration of post Basel reforms”

**Figure 6.1:** Interest rate changes required given different ROE requirements

**Required change in interest rate on lending to the public given ROE requirements in steady state, bps**



Assumption: Same size, portfolio structure and profitability of assets as per today, 70% dividend payout ratio  
Source: Oliver Wyman analysis

As prices rise, demand falls. Since increased capital minima require banks to increase the interest rates they charge borrowers, we should also expect them to cause borrowing to decline.



### Box 3: Modigliani-Miller (M-M) Theorem<sup>14</sup>

In their seminal paper, Modigliani and Miller (1958) show that, under idealised conditions, it does not matter what proportion of a firm's funding comes from equity rather than debt. That is to say, a firm's cost of funding is invariant to the mix of funding. Adding more equity makes a firm less risky, and reduces the cost of each unit of equity or debt by an amount that exactly offsets the switch to an otherwise more expensive mix of funding. This fundamental theory of finance is the core reason why some theorists and their followers argue that there is no economic cost to forcing banks to fund themselves much more through common equity.

However, the real world differs in various significant ways from the idealised conditions under which the M-M theorem holds. This in turn has implications for bank capital requirements, which increase the share of equity on a bank's balance sheet.

**Tax advantages for debt:** Modigliani and Miller ignored corporate taxes in their initial work. In reality, interest payments on debt and deposits are tax deductible in most countries, while dividends to shareholders are not, creating a major incentive for banks and other firms to fund with debt. Thus, an increase in common equity capital requirements would increase bank funding costs. Without some offsetting factor, some or all of this cost would be passed on to borrowers.

**Deposit guarantees and other backstops:** Bank deposits are guaranteed up to certain limits, and some argue that government policies provide protection to uninsured deposits and bank debt through implicit guarantees. Guarantees of debt and deposits block the key mechanism of Modigliani-Miller, since there is little reason for funders with guarantees to lower their charges as banks become safer. A perfect risk-based pricing system for guarantees would offset the behavioural effect. However, we do not have this in practice and are unlikely to achieve it, for both political and technical reasons.

**Issuance costs:** Modigliani-Miller does not take transactional costs of raising funding into account. There are two key reasons why these costs are higher for equities. Firstly, the direct issuance costs for equity are significantly higher than for debt or deposits. Secondly, investors tend to insist on a significant price discount if a bank wants to sell them stock, as there is a possibility that the management wants to sell stock for a particular reason (it expects the price to decline, for example). As such, it may make sense for banks to build equity slowly over time by retaining all profits, avoiding dividend distribution (although cutting dividends is difficult in practice due to its signalling effect) and sharing buybacks. This eliminates the problem of issuance costs, but creates potential for market distortion, as some banks build equity more quickly than others.

**Investor reactions:** The theorem relies on investors to lower their return requirements proportionally with the reduction in risk implied by the increase in equity. In fact, many studies have cast doubt on the extent to which this actually occurs in the market, creating a whole literature, and even investment category, around the "low risk anomaly". (Baker and Wurgler demonstrate this specifically for banks, as well as referencing the wider literature.) In addition, the market appears for now to have some scepticism about exactly how much the adding of equity actually increases bank safety. As such, investors may not lower their required return as much as Modigliani-Miller assumes as banks raise more equity. This will create pressure for banks to avoid operating with significantly higher equity levels.

**Shadow banking:** The higher costs that would be imposed on banks because of these real world issues would create strong market pressure to move business out of the highly regulated banking system into various forms of shadow banking. Dodd-Frank has given U.S. regulators some powers to deal with shadow banking, but nothing like the authority that would be needed to counteract a high level of market pressure. A financial system that relied primarily on shadow banking entities, which are less regulated and typically have lower capital levels, would be more vulnerable to crises that would shake the wider economy.

**Transition issues:** Given the still fragile global economy, there are a number of transition issues that may prevent Modigliani-Miller from holding under idealised conditions.

The negative relationship between capital requirements and lending volumes can be understood in another way. Like most firms, banks are funded by a combination of equity capital and debt capital. In an entirely unregulated market, they would be free to advance all of this to borrowers (although the risk entailed would mean that creditors would charge punitive interest rates to such a bank). Regulations that require banks to hold capital and liquidity reserves limit the size of the total lending stock, given the existing capital and debt funding structure. The higher the capital requirements, the more constrained the bank is in

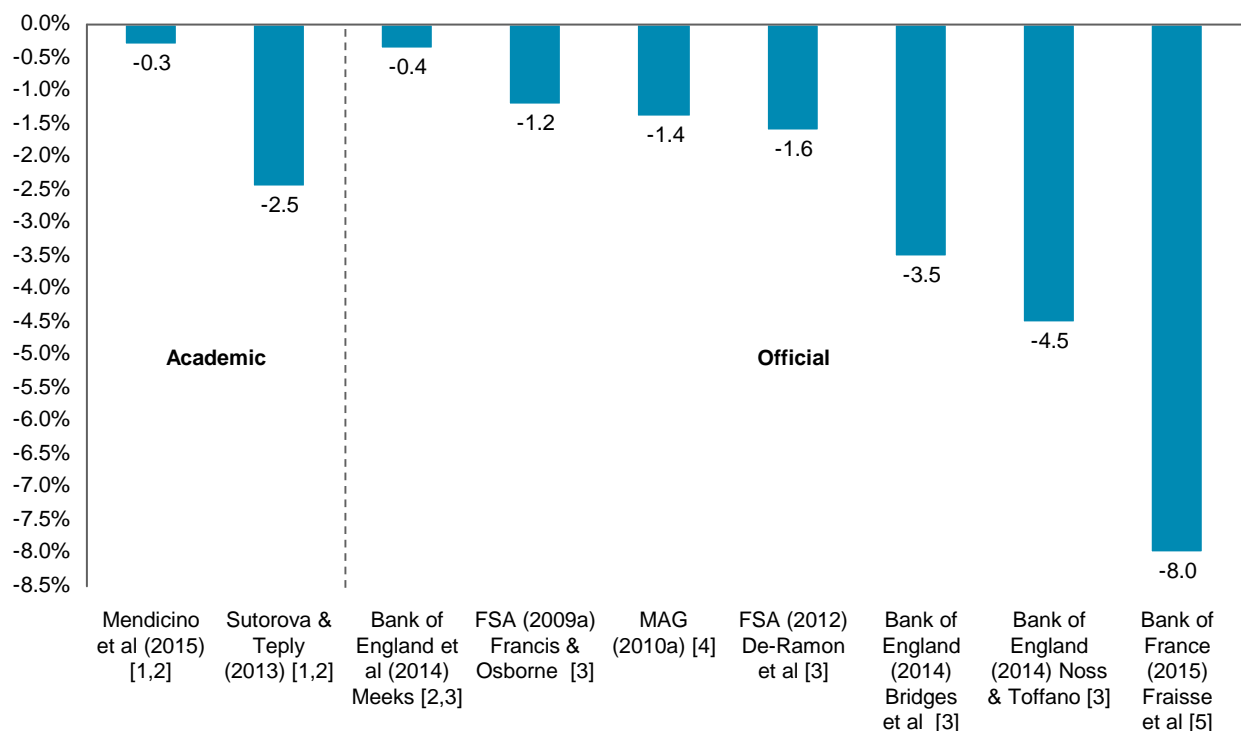
<sup>14</sup> Oliver Wyman (2016), "Interaction, coherence, and overall calibration of post Basel reforms"

how much it can lend before it needs to assemble more capital through equity issuance and/or retained earnings, and so on. In this way, capital regulations directly limit bank lending, and the increase in the price of borrowing is a normal market response to reduced supply. Thus, increasing capital requirements will shift the threshold capital level at which banks lend to the public. Below that particular threshold, banks will retain capital to build up their buffers.

These theoretical reasons for expecting increased capital requirements to reduce lending are confirmed by empirical studies. The size of the effect is not clear from the evidence, but its direction certainly is (see figure 6.2 below).

**Figure 6.2:** Impact of capital requirements on lending volumes

**Impact of 1 percentage point increase in capital requirement on lending volumes (bps)**



[1] Europe; [2] Estimate of impact on lending volumes (basis points) of increasing ratio of capital to assets by one percentage point is taken from BCBS (2016) "Literature review on integration of regulatory capital and liquidity instruments"; [3] UK only; [4] US, Europe, and Japan; [5] France only

The effects on borrowing will not be uniform across borrower classes. The cost of regulation for borrowers is determined by two factors: the size of the regulatory burden, and the availability of less regulated alternatives. Consumers and businesses with ready access to alternative sources of finance are less likely to pay the costs that regulation imposes. Conversely, consumers and businesses without access to effective alternatives to bank lending are more likely to pay.

Large companies can raise funds by issuing bonds, bypassing bank lending. And consumers with savings, or businesses with reserves, can draw on these funds rather than borrow at excessively high rates. The larger the margin or "wedge" the regulatory burden drives

between deposit rates and borrowing rates, the greater the incentive of consumers and investors to draw on savings rather than borrow. Consumers and businesses without savings or the scale to issue bonds, however, can choose only between borrowing from banks, foregoing their planned consumption or investment, or looking for alternative forms of borrowing outside the banking industry (such as peer-to-peer lending and other financial technology solutions that may not be regulated by financial supervisory authorities). The effects of higher regulatory burdens on banks must therefore include reduced consumption and investment.

The Bank of England released a study on the implications of increased capital requirements on bank lending in May 2015. They found that in the year following an increase in capital requirements, the rate of growth in bank lending declined – for commercial real estate (which declined the most), corporates, and households (which declined the least).

A paper released by Goldman Sachs Global Markets Institute in 2014 found that low-income consumers and small businesses – which generally have fewer or less effective alternatives to bank credit – have paid the largest price for increased bank regulation. For example, for a near-minimum wage worker who has maintained some access to bank credit (which many have not in the wake of the financial crisis), the added annual interest expenses associated with a typical level of debt would be roughly equivalent to one week's wages.

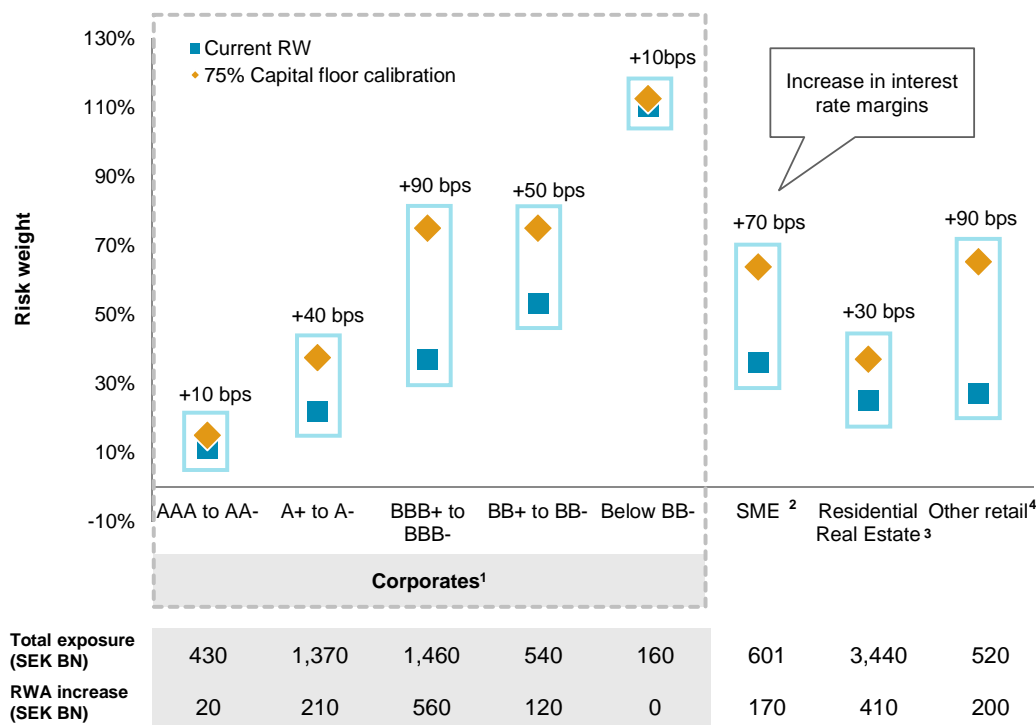
For SMEs, the cost of increased bank regulation is even greater. Their funding costs have risen 175 basis points more than those of their larger peers, when measured against the pre-crisis period. That differential is enough to seriously damage the ability of smaller firms to compete with their larger competitors. This has become all too evident in the economic statistics and is changing the shape of American business, as SMEs, the historic engines of U.S. job creation are displaced by large corporations.

Increases in the cost of borrowing will also vary according to the difference between current IRB-based risk weights and the risk weights entailed by the capital floors (see Figure 6.3). The types of borrowing where the difference is greatest are those where interest rates are likely to rise most, and where volumes are likely to fall most.

**Figure 6.3: Impact of capital floors on IRB risk weights**

**Change in risk weights across portfolios**

Current IRB RW, RW with a 75% capital floor calibration and equivalent gross increase in interest rate margins<sup>5</sup>



1. Aggregated exposure for SHB, Nordea, SEB, and Swedbank and weighted average risk weights for Nordea, SEB, and Swedbank. Excl. defaults and unrated corporate exposures
  2. SEB, Nordea and SHB report retail SME as a separate line item. Assumed that all SMEs are unrated and satisfy the regulatory preferential rate (sales < EURO 50 MM)
  3. 25% mortgage floor, loans valued at origination for revised standardised approach
  4. Other retail split equally between regulatory retail and other retail
  5. 12% ROE, 22% tax rate and 15% capital base of RWA assumed, interest rate increase is to fully capture ROE requirement
- Source: BCBS second consultative document, Pillar 3 reports for SHB, Nordea, SEB, and Swedbank, Oliver Wyman analysis

The capital floors will shift bank lending volumes not only *between* borrower classes but *within* them. When the regulated minimum risk weight is well above the IRB-based risk weight, it effectively becomes the same for all borrowers within the relevant class, such as SMEs or residential mortgages. This gives banks a strong incentive to favour the high-risk borrowers within any given class, provided their IRB risk weight is below the minimum. The capital cost of lending to them is the same, but because high-risk borrowers are willing to pay more, the bank can achieve a higher return on capital from them. This could put pressure on banks' risk management organisations as the incentives for high-risk lending increases.

Furthermore, there could be significant impact on banks' pricing strategies. Regulatory requirements may effectively replace internal and rating agency criteria as the drivers of internal pricing and allocation mechanisms in several cases. The reason for this is simple: regulations are more constraining than the other methodologies, in terms of the capital and liquidity they require.<sup>15</sup> In practice, this means that regulators implicitly define banks' risk appetite and price strategies, and also, therefore, which kinds of products banks should

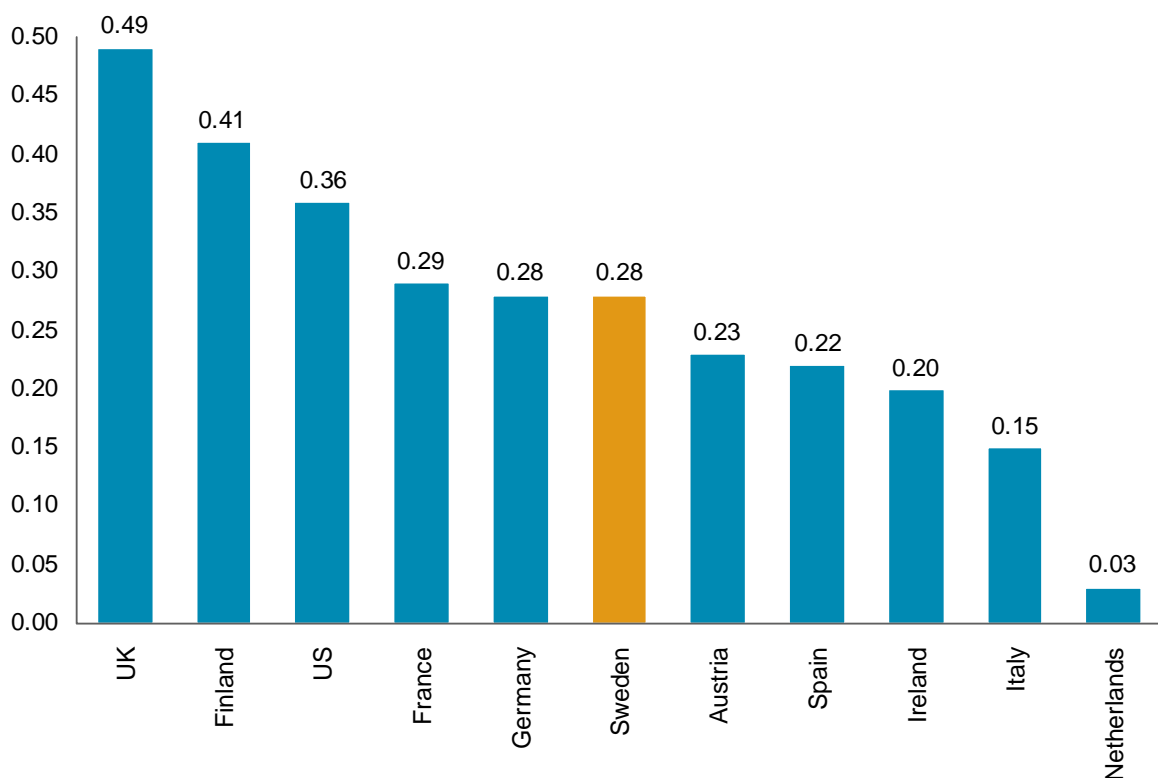
<sup>15</sup> Oliver Wyman (2016), "Interaction, coherence, and overall calibration of post Basel reforms"

develop and which customers to target. This in turn could have broader implications for financial markets. We believe, therefore, that regulators should ensure that any new regulations are preceded by thorough impact analysis, so that potential unintended consequences are properly understood.

The contradictory incentives we discuss here are exactly those which motivated the shift from Basel I (1988), based on standard asset risk weights, to Basel II (2007), which encouraged the use of borrower-specific modelling. Standard risk weights mean that low-risk borrowers within a class are effectively taxed in order to subsidise high-risk borrowers within the class. This increases the aggregate default rate. Even if the capital requirements are sufficiently high to overcome the increased systemic risk, the result is a misallocation of capital, diverting it towards less productive uses. This misallocation will be negative for economic growth – by exactly how much is difficult to estimate.

The relationship between credit growth and economic growth is a matter of considerable research. It is beyond serious doubt that academics have found a positive correlation between credit growth and economic growth (see Figure 6.4).

Figure 6.4: Correlation between credit growth and GDP growth (1980 – 2010)



Source: Oliver Wyman analysis, OECD, SCB, IMF, European Banking Federation

The observation of a correlation does not by itself establish causality. And, in this case, both directions are plausible. Economic growth increases opportunities for investment and consumer confidence, both of which will increase demand for credit. So we might expect GDP growth to cause credit growth. However, an independent expansion in the availability of credit might be expected to stimulate growth, encouraging consumption and investment that

would otherwise not materialise. Indeed, the idea that abundant credit stimulates economic growth has been the foundation of many governments' response to the post-crisis recession. This is also the underlying principle upon which monetary policies executed by central banks is based.

In one study by BIS, published in 2011,<sup>16</sup> the authors found that each percentage point increase in capital ratio causes a median 0.09% decline in the level of steady state output. BCBS performed a literature study in 2016<sup>17</sup> which showed that one percentage point increase in capital ratio results in a 0.04% - 0.20%<sup>18</sup> median reduction in GDP in steady state. Some would argue that the reduction in GDP can be seen as an insurance premium for a more stable financial system. Indeed, the cost of a financial crisis can be significant. In our view, the challenge lies in finding an appropriate calibration for capital requirements that has a net positive impact on the economy.

Another likely effect of regulatory reforms that significantly increase banks' capital requirements is a shift of exposures from regulated to unregulated or lightly regulated entities, or so-called shadow banking. Financial technology (fintech) firms, for example, are not subject to the same regulatory requirements, even when offering identical services. Increasing the capital requirements of regulated entities drives exposures into shadow banking, and some of this movement of exposures can be welcome. Some unregulated firms (such as fintech companies) have produced innovative products that have helped consumers and boosted economic growth.

Researchers have begun to examine the growth of shadow banking. Meeks, Nelson, and Alessandri (2014),<sup>19</sup> for example, find that high leverage in the shadow banking system makes the economy particularly vulnerable to aggregate disturbances. Uninsured funding in the shadow banking sector increases the risk of runs. And studies have found that tail risk may be systematically underpriced in shadow banking transactions, which encourages an excessive quantity of high-risk lending.

## 7. Conclusion

New regulations are always introduced with the intention of improving matters. But good intentions do not guarantee good results. The financial industry is vast, complex and interconnected. And the regulations being introduced to make it safe are also vast, complex and interconnected. The risk of unintended consequences, of regulatory failure, could hardly be greater. Policymakers must carefully assess not only the stated purpose of new financial regulations, but their likely effects – both for good and ill.

This report aims to contribute to answering these questions by identifying some of the costs, and estimating one of them – namely the increased cost of borrowing. More work is required to know whether this, together with other marginal costs of these regulations, exceed the marginal benefits.

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<sup>16</sup> BIS Working Paper 338 (2011)

<sup>17</sup> BCBS Working Paper 30 (2016), Literature review on integration of regulatory capital and liquidity instruments

<sup>18</sup> Based on six studies (LEI 2010, MAG 2010, Slovik and Cournède 2011, Angelini and Gerali 2012, Roger and Vitek 2012, Mendicino et al 2015) looking at wide economic areas (OECD and the Euro area) rather than individual countries

<sup>19</sup> Bank of England, Working Paper No. 487 (2016), Roland Meeks, Benjamin D Nelson and Piergiorgio Alessandri, "Shadow banks and macroeconomic instability"

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