

Banks, Capital and Competitiveness: Challenges with an ECB Working Paper

Bill Nelson | Dec. 17, 2025

A recent working paper published by the ECB found that banks reach peak profit efficiency (defined as a bank's ability to generate revenue given its costs) when their capital ratios are 18 percent, higher than the industry average ratio in the European Union or the international norm. The paper, "Capital requirements: a pillar or a burden for bank competitiveness?" by Markus Behn and Alessio Reghezza from the European Central Bank, concludes that it is therefore untrue that high capital requirements hurt the competitiveness of banks, an assertion that they attribute to the banking industry.[1]

The result is surprising in part because it implies that capital requirements are unnecessary. They are unnecessary because banks should voluntarily choose to fund themselves with capital at an 18 percent level to boost profits. International capital standards were, in fact, premised on the view that if not limited by agreed minimums, countries would reduce, not raise, their capital requirements to make their banks more competitive. Moreover, there is a large well-established body of economic analysis, primarily from the official sector, that concludes that higher capital results in higher costs for banks, because capital is a relatively expensive source of funding.

The answer to these puzzles may be that the conclusion is both imprecise and, more critically, may not be relevant for competitiveness. Imprecise according to the results reported in the paper, but also because of how the analysis was designed. Irrelevant because, if a bank passed all the additional cost of higher capital requirements to its customers by raising the interest rates it charges on loans, its "profit efficiency" would be unimpaired, but the bank would become less competitive relative to other banks whose requirements did not go up and were therefore offering lower loan rates.

The main finding

The central result of the paper is that a bank's profit efficiency peaks at an 18 percent common equity tier 1 ratio. Profit efficiency is defined as how well a bank converts inputs into outputs compared with

[1] Behn, M., Reghezza, A. (2025).

other banks. Inputs are defined as costs: interest expenses, administrative costs, staff expenses, provisioning costs and the cost of equity. The cost of equity is taken from another study.[2] Outputs are defined as interest income and non-interest income.

It is worth emphasizing that profits do not enter into the paper's calculation of the "profit efficiency score." Nor are profits, in this case, simply the difference between revenue and costs, because costs include an estimate of the cost of equity.

The authors use a technique called "data envelopment analysis" to define an efficient frontier for converting inputs into outputs. The frontier is equal to the envelope of the banks with the highest measured efficiency; that is, the banks that generate the most income for each level of expense. The banks that define the frontier have efficiency scores of 1. Every other bank has a score below one, where the score equals the bank's relative amount of revenue for that level of expense compared with the most efficient bank. A bank with a profit efficiency score of 0.72 is achieving only 72 percent of the revenue that a fully efficient bank (one with a score of 1) achieves with the same level of costs.[3]

The authors then examine how efficiency scores correlate with capital levels and capital requirements. Capital is defined as the ratio of common equity to risk-weighted assets (the CET1 ratio). They find no statistically significant linear relationship between efficiency and capital, which they take as evidence that higher capital requirements do not make banks less competitive. Next, they allow a nonlinear relationship between efficiency and capital and find that efficiency peaks at a CET1 ratio of 18 percent.

Three puzzles

The paper's finding that banks can boost their profit efficiency (and, according to the paper, their competitiveness) by funding themselves with more capital raises three puzzles. First, why has it been necessary for the international regulatory community to establish minimum capital standards since 1988 to ensure a level competitive playing field for banks across jurisdictions? Second, why is there a large volume of economic analysis that has found that higher capital requirements raise banks' costs? And third, why don't banks voluntarily choose to fund themselves with more capital to boost profitability?

Why did the Basel Committee need to set minimum capital standards to ensure a level playing field?

The 1988 Basel Capital Accord had two objectives. The first was to ensure the safety and stability of the international banking system. The second was that "…the framework should be fair and have a high degree of consistency in its application to banks in different countries with a view to diminishing an existing source of competitive inequality among international banks."[4] The Basel Committee repeated that objective verbatim when it updated the accord in 1998.[5] When Basel II was introduced in 1994, the Committee stated that its objective was "…maintaining sufficient consistency that capital adequacy regulation will not be a significant source of competitive inequality among internationally active banks."[6] Similarly, the Basel III finalization in 2017 was also intended to ensure a level playing field. Andrea Enria, then the Chair of the Supervisory Board of the ECB, stated about the finalization: "It is a structural

[2] Altavilla, C., et al. (2021).
[3] It may be instead that a bank with a score of 0.72 has costs that are 28 percent higher than a fully efficient bank achieving the same revenue, or perhaps some other slight variant. The score is not precisely defined in the paper.
[4] Basel Committee on Banking Supervision (1988), p.1.
[5] Basel Committee on Banking Supervision (1998), p.1.
[6] Basel Committee on Banking Supervision (2004), p.2.

reform, which aims to restore the credibility of internal models and the level playing field across banks."[7]

More recently, EU regulators and leaders have emphasized that international adoption of the final version of Basel III is important to preserve the competitiveness of European banks by preventing other jurisdictions from enhancing the competitiveness of their banks by reducing capital requirements. Maria Luís Albuquerque, Commissioner for Financial Services, stated in June 2025:

> We fully support implementing the Basel III standards to safeguard global financial stability. Hesitations elsewhere are worrying, but the EU shall not participate in a race-to-the-bottom. At the same time, we should remain vigilant to ensure EU banks remain competitive globally and within the European market, in line with the Savings and Investments Union objectives.[8]

Evidently, the international bank regulatory community has been and remains of the view that a country can gain a competitive advantage for its banks by allowing them to fund themselves with less capital than required in other jurisdictions. Behn and Reghezza, however, suggest that the idea that higher capital requirements reduce a country's banks' competitiveness is something put forward by the banking industry:

> Representatives from the banking industry usually associate [the term 'competitiveness'] with the level of capital requirements or with regulation more broadly, arguing that overly stringent requirements hinder EU banks' competitiveness and ultimately constrain economic growth.[9]

In reality, the official sector has held the same view for decades.

Why do so many other economists find that more capital increases banks' costs?

There is a large body of economic literature, much of it from the official sector, that finds that increasing capital requirements raises bank costs, and that this increase can result in a reduced credit supply and lower national GDP. The analysis began with a 2010 study by the Basel Committee that estimated the optimal level of capital, but includes estimates by the Bank of England, the IMF, the Riksbank, the Federal Reserve Board and even the Federal Reserve Bank of Minneapolis (for a survey see Covas and Nelson (2023)). For example, a BIS study by Fender and Lewrick (2016) is based on the conclusion that each percentage point increase in the banking industry's CET1 ratios reduces GDP permanently by 12 basis points because the higher costs for banks result in increased loan interest rates.

Why are capital requirements necessary if more capital boosts profitability?

If, as suggested by this research, bank profitability is maximized by a CET1 ratio of 18 percent, why would firms choose to maintain CET1 ratios less than 18 percent? There are two main reasons why banks may choose to fund themselves with less capital than is socially optimal, but neither is applicable.

First, there are externalities associated with bank failures that banks do not internalize. In particular, a bank failure can trigger other bank failures and a widespread run on banks leading to a financial crisis, and financial crises are extremely damaging. But this is a reason why banks should fund themselves with more capital than they would choose based on simply maximizing their own profitability. The paper

[7] Enria, A. (2021).
[8] Albuquerque, M. L. (2025).
[9] Behn, M., Reghezza, A. (2025), p.4.

suggests that banks would maximize their profitability with CET1 ratios of 18 percent. Nevertheless, banks choose lower CET1 ratios, and the international standard minimum for the CET1 ratio is 7 percent.

Second, bank creditors may be insufficiently sensitive to bank risk, either because of deposit insurance or because the bank is expected to be bailed out and not allowed to fail. Consequently, banks have a profit incentive to fund themselves with more debt and less equity. However, Behn and Reghezza's results are based on analysis that includes the sensitivity of interest expense to equity, so should take into account creditors' risk sensitivity. Banks, responding to the supposed low sensitivity, should evidently choose to maintain CET1 ratios of 18 percent, but they don't.

The result may be imprecise

Taking as given that "profit efficiency" is both roughly the same as "profitability" and that it is a good metric for competitiveness (the next section discusses why these assumptions may be false), a resolution to these puzzles may be found in a recognition that the Behn-Reghezza result may be imprecise. Consequently, even though they found that bank profit efficiency is maximized at a CET1 ratio of 18 percent, banks may actually be most efficient when their CET1 ratio is lower. That would explain why the international capital requirement framework is premised on the view that, left to their own devices, banks would want to fund themselves with less capital to increase their competitiveness.

It is difficult to know, though, because the paper does not include the underlying statistical results, nor does it include precise definitions or basic distributional statistics for the variables used. The paper just includes prose descriptions of the results and graphs and tables providing high-level implications. One graph (Chart 4.4, p. 25) suggests that the confidence interval around the 18 percent result goes from 15 percent to above 24 percent, but it is hard to be sure.

There are many important questions about the statistical analysis that are left unanswered because the paper does not include the underlying results. For example, the authors use many different balance sheet measures as control variables in their analysis of how efficiency relates to capital, but many of the measures are interrelated, which will reduce measured statistical significance. Just as one example, they include "degree of deposit reliance" as a control, which is not defined but is probably the ratio of deposits to assets or something similar, but if capital to assets is higher or lower, deposits to assets will be lower or higher holding other liabilities constant. They may find that capital ratios do not help explain efficiency because deposit ratios are included in their regression as well. Similar questions arise about several of the other control variables. Another highly technical but critical and unreported issue is how the standard errors are calculated.

Relatedly, the authors report finding that a 1 percentage point increase in the CET1 ratio results in a 4 basis point reduction in the ratio of interest expense to assets. But the result is simply a consequence of balance sheet arithmetic, not evidence that banks with more capital pay less for liabilities. The mistake is that the authors use interest expense *to assets*, not interest expense *to liabilities* as their measure of funding costs. A bank that is funded more with equity has a lower level of liabilities for the same amount of assets, so its interest expense to asset ratio goes down automatically. For example, the ratio of interest expense to assets of a bank funded with 11 percent equity is 5 basis points lower than one with 10 percent equity, if interest rates are 5 percent. Although the authors state that their finding is similar to one reported in Gambacorta and Shin (2018), those authors used interest expense to liabilities as their measure of funding cost, not interest expense to assets.

Moreover, there are challenges associated with the authors' analytical approach. For one, the estimation assumes that the banks in the sample are all using the same production technology. But the banks in the sample that choose to fund themselves with more than 18 percent equity are almost surely quite different from the banks that fund themselves with less than 18 percent. For example, at the end of the third quarter, commercial banks in the United States with CET1 ratios of 20 percent or higher were, on average, one-third the size of banks with CET1 ratios of 16 percent or lower. They also had a 50 percent higher average loan-to-asset ratio. Moreover, the period of analysis coincides with enormous changes in Europe's bank regulatory framework that heavily interact both with banks' capital decisions and the precise measurement of their profitability.

Lastly, the authors choose to estimate the efficient frontier using a nonparametric approach. While, as they note, that allows for more flexibility, it does not account for stochastic variation – nonparametric frontier methods treat every deviation from the observed "best-practice" envelope as inefficiency because they lack a stochastic noise term; as a result, they are highly sensitive to outliers, measurement error and transitory shocks, and cannot provide inference or separate bad luck from true inefficiency.

The result is inapplicable

Even more importantly, the result reported in the paper may not be especially relevant for international banking competitiveness. The paper does not measure competitiveness; it measures profit efficiency. Profit efficiency measures how well, relative to other banks in the sample, a bank converts costs into revenues. Competitiveness in banking, however, boils down roughly to "who can charge a lower interest rate for a given loan?" The difference in meaning creates two reasons why the efficiency result is inapplicable for evaluating competitiveness.

First, the efficiency measure is relative, not absolute. That is, each bank's efficiency is only measured relative to other banks in the sample. The sample consists entirely of banks from the European Union. If those banks are all subject to higher capital requirements than banks in a jurisdiction with which they seek to compete, and therefore all face higher costs of producing credit, those higher costs will not show up as lower efficiency. Nevertheless, because they all have higher costs, the banks as a group would be less competitive compared with banks in the other jurisdiction.

Second, if a bank charges more for loans to make up fully for its higher funding cost, its "efficiency" will be essentially unchanged, but it will be less competitive. Suppose an increase in capital requirements forces a bank to fund itself more with equity and less with deposits or other borrowing. Because equity is more costly than debt, suppose the bank's funding costs go up by $100 million. If the bank responds by raising its lending rates to collect an additional $100 million, its profit efficiency will be essentially unchanged. However, an international business choosing from which bank to borrow doesn't care about the bank's relative profit efficiency, it cares about how much the loan will cost. The business would therefore choose to borrow from a bank in a jurisdiction with lower capital requirements, other things equal.

While not relevant for competitiveness but perhaps of interest for policymakers nonetheless, the higher loan rates will also result in lower GDP and employment. That's the cost of higher capital requirements that factor into almost all estimates of optimal capital.

Conclusion

Contrary to the authors' conclusions, the results in "Capital requirements: a pillar or a burden for bank competitiveness?" do not indicate that bank competitiveness is not reduced by raising capital requirements. That is, the findings that "profit efficiency" is insignificantly related to capital in a linear specification and maximized at an 18 percent CET1 ratio in a nonlinear specification do not mean that banks would be most competitive if they funded themselves with 18 percent equity.

First, although the precision of the paper's results is not reported (none of the underlying statistical results are reported), it is likely to be low. While the authors find peak profit efficiency at 18 percent CET1 ratio, efficiency may be maximized at a much lower level, or the optimal level may vary widely across banks.

Second, "profit efficiency" is a poor measure of competitiveness. It is a relative, not absolute, measure, so if the competitiveness of all the banks in the sample (which consists entirely of euro area banks) is hampered by high capital requirements, measured profit efficiency would be unaffected. Moreover, if a bank passed all of its higher costs on to its customers by raising lending rates, its profit efficiency would be essentially unaffected, but it would be less competitive than a bank with lower costs.

Even setting those issues aside, the authors' conclusions are at odds with the revealed choices of banks and the foundational premise of the Basel international capital accords. If a bank maximizes its profit efficiency and competitiveness by funding itself with significantly more capital, it would do so voluntarily. The standard explanations for why socially optimal levels of capital are higher than privately optimal levels are moot – the finding suggests that the bank's privately optimal CET1 ratio is 18 percent. Indeed, a primary stated reason for the Basel capital accords is to prevent countries from seeking to enhance the competitiveness of their banks by *lowering* capital requirements. If the conclusion of the paper is correct, the work of the Basel Committee for the past 40 years has been unnecessary.

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