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# Do unrealised bank losses affect loan pricing?*

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*As central banks tighten their monetary policies, long-term assets may experience significant drops in their market values. While holding securities until maturity shields banks from direct capital losses resulting from increasing rates, the risk of materialisation of unrealised losses from HTM portfolio may affect bank loan supply decisions. I find that banks with 1 pp higher share of unrealized losses in their risk-weighted assets charge on average 8 bps higher lending rates to corporates in Slovenia. These unrealized losses have a lower impact compared to actual changes in capital, for which the literature establishes the impact of around 10-25 bps.*

*The views expressed in this paper are solely the responsibility of the author and do not necessarily reflect the views of the Bank of Slovenia or the Eurosystem.

## 1. Introduction

The Silicon Valley Bank's (SVB) collapse on March 10, 2023, has brought attention to banks' susceptibility to interest rate risk stemming from their investment portfolios. Typically, banks hold assets with long-term maturity, whereas they primarily fund their assets through short-term liabilities. This maturity mismatch can result in losses when interest rates begin to increase. As central banks tighten their monetary policies, long-term assets may experience significant drops in their market values. However, if banks can retain these assets on their balance sheets until maturity, this should not result in any issues for banks.

The ECB raised its key policy rates by 3.5 percentage points from July 2022 to March 2023 in response to inflation in the euro area. This led to banks experiencing realised or unrealised losses on their investment portfolios, particularly for financial assets available for sale (AFS) which directly impact bank capital through other comprehensive income. While securities held to maturity (HTM) are also affected by increasing rates, the losses are unrealised as they are valued at amortized costs. Banks may be incentivized to switch to HTM accounting to avoid realising losses, but they must declare their intention and ability to hold securities until maturity to do so.

Several papers emerged after the collapse of the SVB, studying the association between unrealised losses and deposit withdrawal (Dursun-de Neef et al., 2023 and Jiang, 2023) and incentives for reclassifications from AFS to HTM portfolio by banks (Granja, 2023). This paper instead analyses the impact of unrealised losses on bank lending rates. While the relation between actual bank losses or changes in capital requirements is well established in the literature (see for instance Gropp et al., 2019 and Sivec and Volk, 2021), the impact of unrealised losses is largely unexplored.

I find that banks with 1pp higher share of unrealised losses in their risk weighted assets charge on average 8bps higher lending rate to corporates in Slovenia. The rational for the above result follows from the risk of loss materialisation, which would erode capital. As these are unrealised losses, the impact is lower compared to actual changes in capital, for which the impact is around 10-25 bps (Dagher et al., 2016).

## 2. AFS vs. HTM accounting and unrealised losses

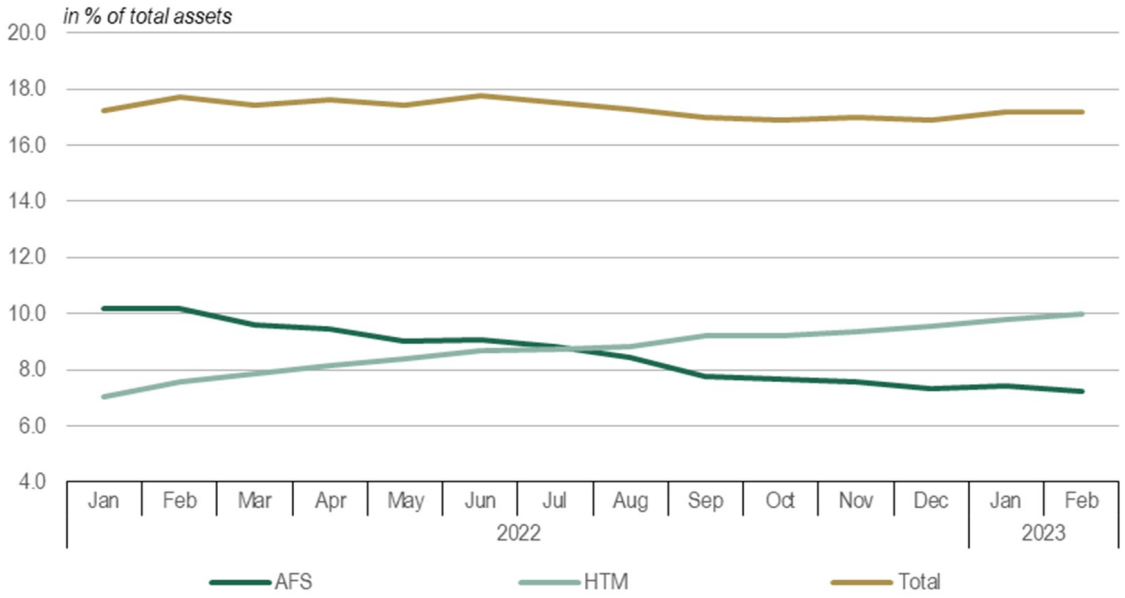
With the introduction of IFRS9 in 2018, banks classify financial assets into two categories: financial assets measured at amortized cost and financial assets measured at fair value (either through P&L or other comprehensive income).[1] For simplicity, I use IAS 39 references for the two categories, which are securities held to maturity (HTM) and available for sale (AFS). In order to use HTM accounting, banks must declare their intention and ability to hold securities until maturity, thus avoiding the need to close positions at a substantial accounting loss. Otherwise, banks must resort to AFS accounting, which requires them to mark securities on their balance sheets at current market prices and recognize any unrealized losses on those securities in their statements of comprehensive income.

The monetary policy tightening cycle that started at the beginning of 2022, and intensified after July 2022, when the ECB started raising policy rate, had a significant impact on the prices of securities with long maturities. If banks did not use the HTM accounting approach to value these securities, they would have to recognize losses that would be directly reflected in their capital through other comprehensive income.

[1] IFRS 9 Financial instruments.

In line with the above incentive by banks to use the HTM accounting in current environment, Figure 1 shows that Slovenian banks were swapping AFS holdings for HTM over the last year. Whereas in January 2022, AFS and HTM holdings represented 10% and 7% of banking system total assets, respectively, the relation reversed by February 2023, while total financial assets remained constant. The change in the relation in favour of HTM holdings is not due to reclassification from AFS to HTM[2], but rather reflecting the replacement of maturing AFS financial assets with HTM securities.

**Figure 1: AFS and HTM holdings by Slovenian banks**




*Note: The figure shows the decomposition of securities/assets held by banks to AFS and HTM holdings. Source: Banka Slovenije, own calculations.*

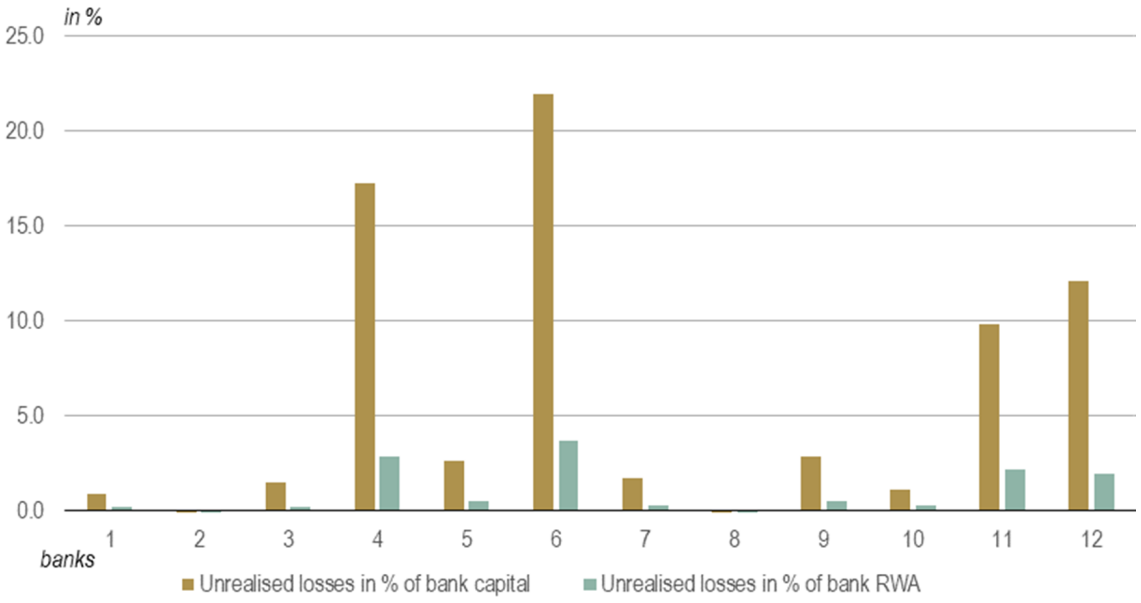
Raising interest rates resulted in 8% lower market value of HTM securities, with respect to its book value, measured in February 2023. This amount of unrealised losses represents 8% of banking system's capital and 1.2% of risk-weighted assets (RWA), which implies that banking system capital adequacy would be lower by 1.2pp in case of realisation of these losses. With close to 19% total capital adequacy ratio in December 2022[3], this amount of potential losses does not seem problematic for Slovenian banking system as a whole, but could be more challenging for some banks, as unrealised losses reach up to 22% of bank capital (Figure 2).

The unrealised losses from HTM securities do not affect banks' P&L and capital, as long as a bank holds assets until maturity. However, banks could find themselves in a situation where they would need liquidity, which would force them to sell the HTM securities with a loss. An example of this would be a large outflow of deposits. Although the probability of such an event is rather low, the risk always exists and it could impact banks behaviour, like for instance their loan supply decisions. In the following section, I test if unrealised losses affect banks' loan pricing policy.

[2] Banks approached the regulator with the request to reclassify certain assets from AFS to HTM, but their request was denied.

[3] See Monthly report on bank performance, March 2023.

**Figure 2: Unrealised losses from HTM securities**




*Note: The figure shows bank level unrealised losses from HTM debt securities expressed in % of RWA and bank capital. Source: Banka Slovenije, own calculations.*

## 3. The impact of unrealised losses on bank lending rate

This section presents the estimates of the impact of unrealised losses on bank loan pricing in Slovenia. I use loan level data and model lending rate for new loans given by bank *b*, to firm *f* in time *t*. The key explanatory variable in the regression are unrealised losses from HTM holdings, measured in February 2023[4], and expressed either as a share in bank capital or as share in RWA – as presented in Figure 2. The regression controls also for other bank characteristics that might be relevant for explaining bank loan pricing. In particular, the set of controls includes the following variables: capital adequacy ratio, NPL ratio, ROA, funding costs, log of total assets and annual credit growth at a bank level. All the variables are measured one month before the initial policy rate hike, i.e. in June 2022. In addition, I also control for loan-specific characteristics like loan maturity, credit rating, collateral and interest rate fixation.

I apply the methodology by Degryse et al. (2019) where the demand side is controlled for with industry-location-size-time fixed effects. Further, I include bank fixed effects that absorb other time invariant bank characteristics.

The estimation period consists of data before policy rate hikes and afterwards. In particular, I estimate the regression for the period from January 2022 to February 2023. Within this, the main interest lies in the period when the ECB key policy rate was increasing, i.e. from July 2022 on. Therefore, the coefficient of interest tells the impact of unrealised losses during the period of increasing rates.

The loan level data used for the above estimates are obtained from a reach credit registry database, maintained by the Banka Slovenije, that covers all corporate exposures. The estimates used data on monthly frequency, resulting in about 61.000 observations over the course of 14 months from January 2022 to February 2023.

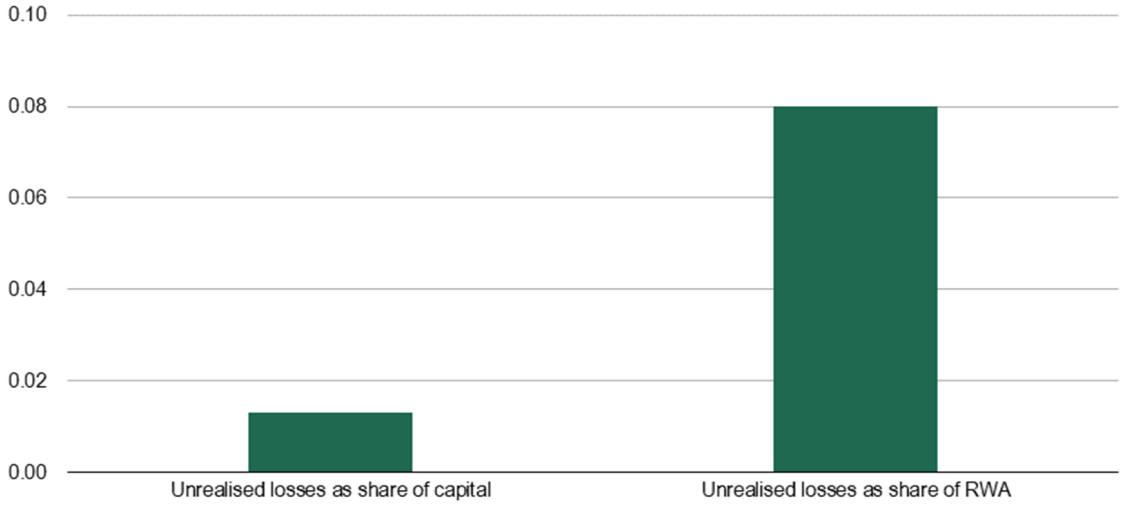
[4] I tested different cut-off dates for accounting losses (from November 2022 to February 2023) and the results are always very similar to the ones presented in the paper. All the estimates are available upon request.

The results presented in Figure 3 show that banks with one percentage point higher unrealised losses in their capital, charge on average 1.3 bps higher rate to corporates. For an average bank with 6% share of unrealised losses in its capital, the lending rate during the period of raising policy rates is higher by about 8 basis points. Similar conclusion follows also for the elasticity of unrealised losses measured as share of RWA, that equals to 8 bps and for an average bank the amount of unrealised losses in percent of RWA is 1%. Both effects are highly significant (t-statistic > 13).

The rational for the above result follows from the risk of materialisation of the losses, which would erode bank capital. The relation between changes in bank capital and lending rate is well established in the literature (see Dagher et al., 2016) that finds on average 10-25 bps higher lending rate in banks with 1pp higher capital requirements (or an equivalent decrease in capital). As these are realised changes in capital, they expectedly have higher impact on loan pricing compared to my estimate of 8 bps higher lending rate in bank with 1pp higher share of unrealised losses in RWA.

Next, I explore the heterogeneity of the impact of unrealised losses on lending rates across bank and firm characteristics. In particular, the two characteristics explored in this study are bank/firm size, measured with total assets, and bank/firm indebtedness, which is for banks measured with leverage ratio and with debt-to-asset ratio for firms. For each characteristic, I split banks/firms into two clusters: those above the median value of the variable of interest and those below it. I then interact these dummy variables with the key variable of interest – HTM losses as share of RWA – to obtain the heterogeneous impacts.

**Figure 3: The impact of 1pp increase in unrealised losses on bank lending rate**



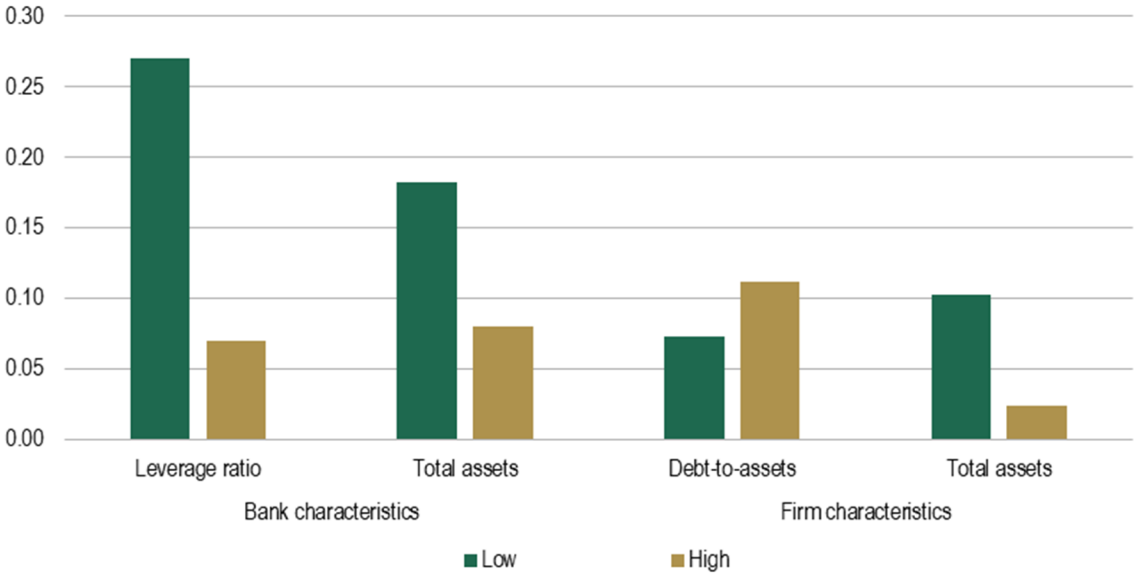

*Note: The figure shows the impact of unrealised losses from HTM holdings, expressed either as share of bank capital or RWA, on lending rate to corporates in Slovenia after the start of policy rate hiking in July 2022 Estimation period: Jan 2022 – Feb 2023. Impact in pp. Source: Banka Slovenije, own calculations.*

Heterogeneous impacts are presented in Figure 4.[5] It shows that banks with below median level of capitalisation show higher elasticity of lending rate to an increase in unrealised losses. In particular, banks in low capitalisation cluster increase lending rates by over 25bps for every percentage point increase in unrealised losses, as opposed to 7 bps impact for banks with high capitalisation. This is expected, as banks with less capital have a lower cushion above capital requirements or above their internal targets. I also find higher responsiveness in smaller banks, that could have more troubles in obtaining additional liquidity or equity in case of loss materialisation.

[5] All the presented coefficients and the differences between Low and High cluster are statistically significant.

Looking at heterogeneity across firms, I find that in response to unrealised losses, banks increased rates by more for more indebted and smaller firms. As both measures are proxies for firm riskiness, this result implies that banks transmitted this impact more to riskier firms. This allocation is desired as healthier firms, that are likely to be more productive on a longer run, are less affected by the HTM losses.

**Figure 4: The heterogeneity of the impact of unrealised losses on lending rate**




*Note: The figure shows the heterogeneity of the impact of unrealised losses, expressed as share of RWA, on lending rate to corporates in Slovenia after the start of policy rate hiking in July 2022. The heterogeneity is across bank and firm characteristics, where banks/firms are split to Low/High cluster if the value of the variable of interest (like leverage ratio) lies below/above the median. Estimation period: Jan 2022 – Feb 2023. Impact in pp. Source: Banka Slovenije, own calculations.*

## Conclusion

The recent collapse of Silicon Valley Bank has drawn attention to the susceptibility of banks to interest rate risk arising from their investment portfolios. The ECB's 3.5 percentage point increase in key policy rates from July 2022 to March 2023 led to realized or unrealized losses on investment portfolios, particularly for assets available for sale, which can directly impact bank capital. Banks may switch to holding securities until maturity to avoid realizing losses, but they must declare their intention and ability to do so. I find that banks with higher unrealized losses in their risk-weighted assets charge higher lending rates to corporates in Slovenia, reflecting the risk of loss materialization and potential capital erosion. This contributes to faster transmission of tightening monetary policy to bank lending rates, which was so far very limited through the deposit channel (see Volk, 2023).

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## About the author

***Matjaž Volk*** *joined the monetary policy analysis division in the Bank of Slovenia in July 2021, where his main field of work is bank-based transmission of monetary policy. Previously he worked in the area of financial stability, starting his career in 2009 in the Bank of Slovenia and later joined the stress test modelling division at the European Central Bank in 2018, where he contributed to development of macroproprudenial stress test model. His research in the field of empirical banking has been published in the Journal of Banking and Finance, International Journal of Central Banking, Quarterly Review of Economics and Finance, and others. He holds a PhD in economics from University of Ljubljana.*