Methodological Summary

SME Exposure and Bank Profitability During COVID-19

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Goal

This assignment investigates how banks' exposure to small and medium-sized enterprises (SME exposure) affected their profitability during the COVID-19 shock. Using quarterly bank-level data from the publicly available "Brazilian Banks" dataset, we compare the performance of institutions with different degrees of SME exposure throughout the pandemic. The aim is to determine whether higher SME exposure amplified or mitigated profitability losses as COVID unfolded.

Data

The dataset contains quarterly observations for Brazilian banks. Each row corresponds to a bank–quarter pair, and the key variables include:

- **log_assets** and **assets**: bank size measures,

- **Net_Income_qtr**: quarterly net income,

- **eq_assets**, **dep_assets**, **loans_assets**, **adminexp_assets**: balance-sheet and cost ratios,

- **SME_exposure**: share of SME-related credit,

- **segment**, **state**: categorical bank characteristics,

- **quarter**, **id**: time and bank identifiers.

Profitability is measured using quarterly Return on Assets (ROA), computed as

$$\text{ROA}_{it} = \frac{\text{Net\_Income\_qtr}_{it}}{\exp(\text{log\_assets}_{it})}.$$

We use *2019 Q4* as the last pre-COVID quarter and begin evaluating the impact of COVID in *2022 Q4*. With the full quarterly panel, we can track pre- and post-COVID profitability developments.

Methodology

We treat this as an exploratory causal analysis. First, we define two types of treatment: (1) a binary indicator based on whether a bank's SME exposure in 2019 Q4 is above or below the median, and (2) the original continuous SME exposure. Using both allows us to compare results from a simple treated–control setup with a specification that keeps all variation.

To improve comparability between high- and low-exposure banks, we try two matching approaches. The first is Propensity Score Matching (PSM), where we use 2019 Q4 balance-sheet and categorical variables as covariates. The second is Coarsened Exact Matching (CEM), which groups banks into coarser bins and matches them exactly on these categories. CEM provides a simpler and more transparent way to balance covariates, so using both methods lets us check the robustness of our results.

After matching, we estimate Difference-in-Differences (DID) models on the full quarterly panel to compare how profitability evolves before and after the COVID period across banks with different SME exposure levels. Since we have several pre-COVID quarters, we also examine whether the treated and control groups follow similar trends before 2019 Q4, which is important for interpreting DID results.