The Impact of Central Bank Interventions Non-Performing Loans Under COVID-19 Pandemic *The United Kingdom and Brazilian Study Case.*

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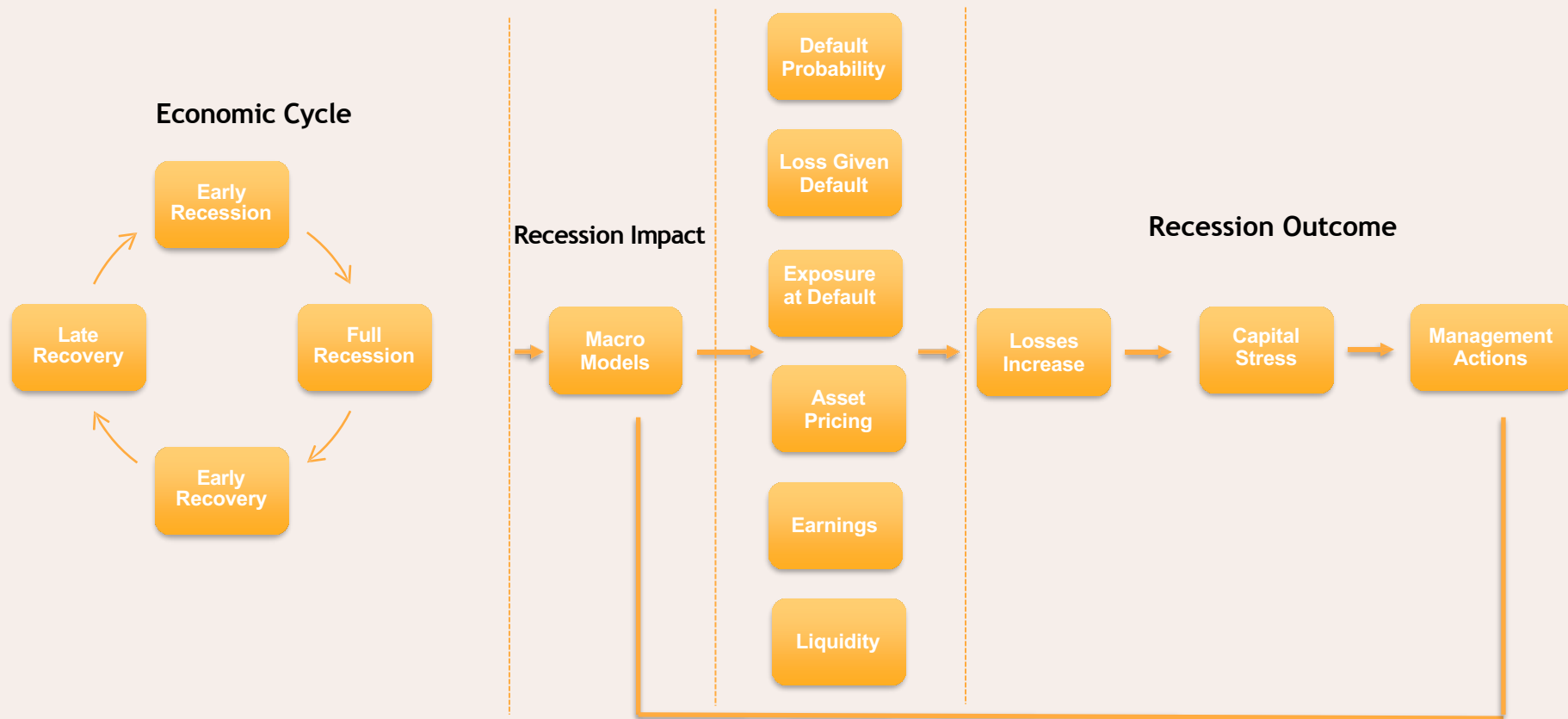*frederico.barros-diniz@warwick.ac.uk*

Objectives

Assess the **impact** of the Bank of England (BoE) and the Brazilian Central Bank's (BSB) **monetary policies** implemented to minimise the effect caused by the Covid-19 pandemic on the country's **Non-Performing Loans**.

Non-Performing Loans: is a bank asset that is subject to late repayment or is unlikely to be repaid by the borrower in full.

*"Non-performing loans represent a major challenge for the banking sector, as it **reduces the profitability** of banks and is often presented as **preventing banks from lending** more to businesses and consumers, **slowing down economic growth**."*

Introduction

Economic Cycle

Early Recession → Full Recession → Early Recovery → Late Recovery → Early Recession

Affected Parameters

- Default Probability
- Loss Given Default
- Exposure at Default
- Asset Pricing
- Earnings
- Liquidity

Recession Impact

Macro Models

Recession Outcome

Losses Increase → Capital Stress → Management Actions

Actions are taken by the BoE and BCB in response to the Covid-19 Economic crisis.

Brazilian Central Bank
1. **Liquidity Support**
- Offer to Commercial banks and building societies long-term funding.
2. **Capital Relief** – BCB adjusted the regulation on capital requirements to provide financial institutions with better conditions to sustain credit flow.
3. **Regulatory changes** to facilitate the application and acceptance of credit facilities for householders and corporates.

Bank of England
1. **Monetary Policy** – Cut our interest rate to 0.1%
2. **Liquidity Support**:
- Offer to Commercial banks and building societies long-term funding.
- Helped businesses pay their staff and suppliers.
3. **Capital Relief** – Helped banks to expand lending

Methodology

- The steps taken to achieve the objective of this research can be defined as follows:

  - **Exploratory data analysis**: the time series' trends, characteristics and the selection of an econometric model were analysed.

  - **Econometric Modelling**: to assess the factors influencing NPL in the British and Brazilian banking sectors.

  - **Projections and comparisons**: to verify the differences between the series projected by the econometric model developed and those observed after the policy measures to minimise the economic impacts of COVID-19.

Data and Scope

- Econometric modelling: 2007Q2 to 2019Q4

  - UK: Exploring 25 Variables to predict Non-Performing Ratio over time. (Source ONS and BoE)

  - Brazil: Exploring 35 Variables to predict Non-Performing Ratio over time. (SFN Bacen)

- The NPL time series used in this work comprises the total outstanding balance of credits with 90 days in arrears on the total credit balance amount.

- Projection data: 2020Q1 to 2021Q4.

Non-Performing Loans (NPL)
Provision and NPL Percentage Series - Mar 2007 to Jan 2021

UK Historical Non-Performing Loans

Covid outbreak – March 2020

Brazil Historical Non-Performing Loans
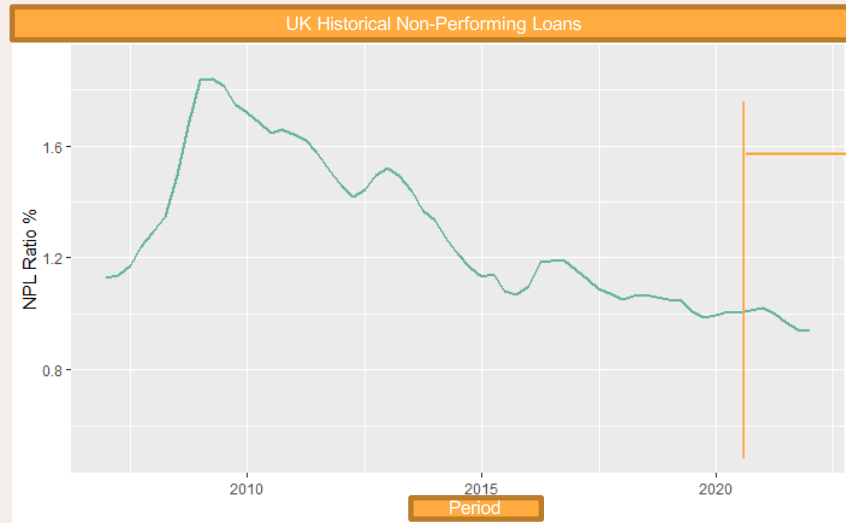
Source: Financial Conduct Authority. n.d. "Mortgage Lending and Administration Return" Accessed November 28. 2021.
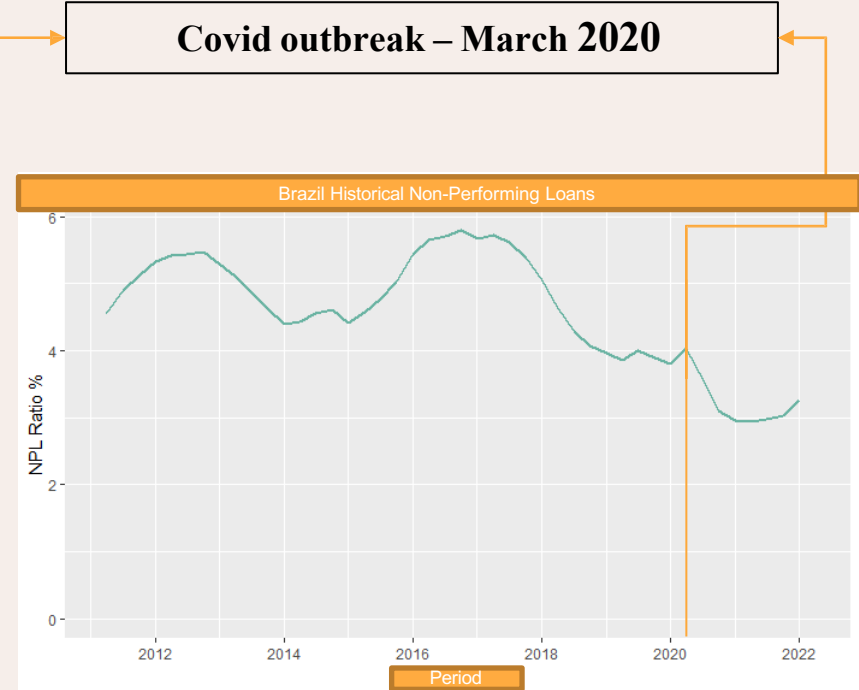
Source: Central Bank of Brazil. n.d. "Time Series Management System." Accessed November 28. 2021.
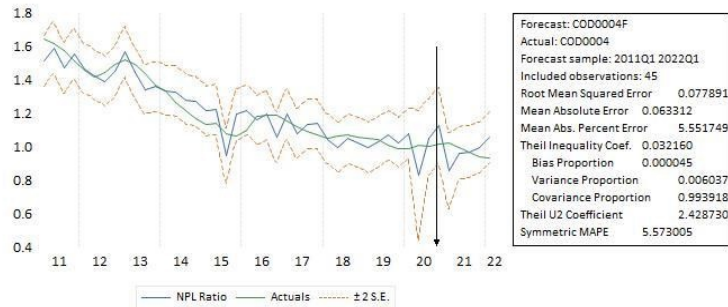
Model Results

United Kingdom

- YoY GDP – Annualised GDP Growth
- UR Hazard – UK: Hazard Rates: Employment to Unemployment (SA, %)
- Real Disp. Income – Household real disposable income

Variable	Coefficient	Std. Error	t-Statistic	Prob.
YoY GOD	4.94E-06	1.77E-06	2.796809	0.0085
UR: Hazard	0.638709	0.043372	14.72643	0.0000
Real Disp. Income	-8.92E-06	2.65E-06	-3.370723	0.0019
R-squared	0.876323	Mean dependent var		0.245444
Adjusted R-squared	0.868828	S.D. dependent var		0.199620
S.E. of regression	0.072298	Akaike info criterion		-2.336387
Sum squared resid	0.172491	Schwarz criterion		-2.204427
Log likelihood	45.05496	Hannan-Quinn criter.		-2.290329
Durbin-Watson stat	1.685265			

Comparison (C.I.) Between Predicted and Actual Values Differences in

Forecast: COD0004F
Actual: COD0004
Forecast sample: 2011Q1 2022Q1
Included observations: 45
Root Mean Squared Error 0.077891
Mean Absolute Error 0.063312
Mean Abs. Percent Error 5.551749
Theil Inequality Coef. 0.032160
Bias Proportion 0.000045
Variance Proportion 0.006037
Covariance Proportion 0.993918
Theil U2 Coefficient 2.428730
Symmetric MAPE 5.573005

Brazil

- NPL – Non-Performing Loans
- GDP – Seasonally adjusted GDP growth
- SELIC – Real interest rate (Selic)
- UR – Seasonality adjustment Unemployment Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0080	0.0186	-0.4303	0.6702
GDP Growth	-39.783	21.160	-18.801	0.0702
D_NPLm (-1)	0.7071	0.0934	75.676	0.0000
D_RSELIC(-1)	0.0520	0.0256	20.326	0.0513
R-squared	0.7427	Mean dependent var		-0.0341
Adjusted R-squared	0.7161	S.D. dependent var		0.1970
S.E. of regression	0.1050	Akaike info criterion		-15.568
Sum squared resid	0.3196	Schwarz aiterion		-13.754
Log likelihood	296.866	Hannan-Quinn alter.		-14.957
F-statistic	279.057	Durbin-Watson stat		21.142
Prob(F-statistic)	0.0000			

Breusch-Godfreey Correlation LM Test 4 lags: $F_{(4, 25)}$ p-value 0.2949
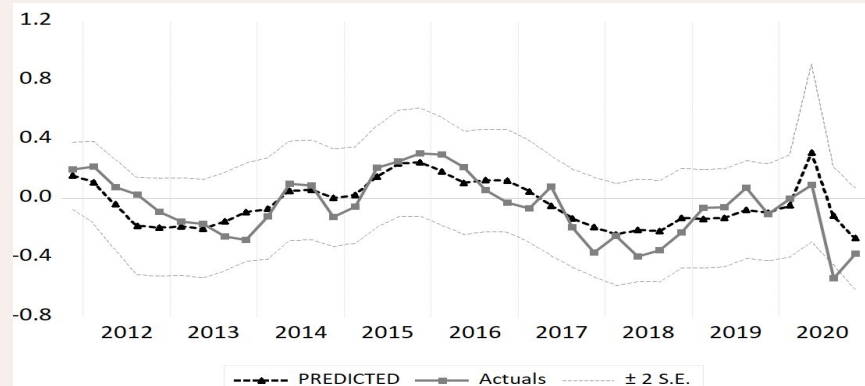
Conclusions

●It can be induced that the NPL observed in 2020 impacts the measures adopted to control the pandemic. Bearing in mind that:

● There was an increase below the expected by the model in 2021Q2;

●There was a sharp reduction in 2020Q3, beyond the confidence interval of the model estimate, and in 2021Q4, when part of the measures to contain the pandemic ceased to be in force.

●There was a trajectory reversal and compensation for the sharp drop beyond what was predicted in the previous movement.