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Fiscal Support, QE and Income-smoothing in European Banks during the COVID-19 Crisis

Małgorzata Olszak https://orcid.org/0000-0001-8920-5309
Associate Professor, University of Warsaw, Faculty of Management, Warsaw, Poland,
e-mail: ma.olszak@uw.edu.pl

Gracjan R. Bachurewicz https://orcid.org/0000-0002-1990-5390
Ph.D., University of Life Sciences in Poznań, Poznan, Poland, e-mail: gracjan.bachurewicz@gmail.com

Christophe Godlewski https://orcid.org/0000-0002-1391-1108
Professor, University of Strasbourg, Faculty of Law and Business, Strasbourg, France,
e-mail: godlewski@unistra.fr

Abstract

This study examines how fiscal and monetary policy responses to the COVID-19 crisis influenced banks' income smoothing through loan-loss provisions (LLPs) in the European Economic Area (EEA). Using a panel of 1,122 commercial banks from 29 countries between 2011 and 2020, we investigate whether the intensity of income smoothing varied with the scale of public support. Fiscal liquidity measures and the European Central Bank's quantitative easing (QE) under the Pandemic Emergency Purchase Programme (PEPP) serve as proxies for government and monetary interventions. The results show that both fiscal and monetary support reduced average LLP levels but simultaneously strengthened the link between earnings and provisioning, indicating increased income-smoothing behavior during the pandemic. This pattern reflects two complementary mechanisms: the crisis-severity channel, where larger policy interventions corresponded to deeper economic stress, and the moral-hazard channel, where public backstops expanded managerial discretion in provisioning. Overall, the findings suggest that large-scale stabilization policies mitigated credit risk and preserved financial stability but also encouraged more discretionary accounting behavior, underscoring a potential trade-off between crisis management and the transparency of banks' financial reporting.

Keywords: loan-loss provisions, income-smoothing, liquidity support
JEL: E44, E58, G21, G28

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Introduction

Income smoothing refers to banks' discretionary use of loan-loss provisions (LLPs) to stabilize reported earnings over time. By adjusting provisions in response to profit fluctuations, managers can buffer earnings volatility and signal stability to markets. While this behavior is well-documented in earlier crises, evidence from the COVID-19 crisis remains limited. Unlike the 2008 Global Financial Crisis (GFC), the pandemic originated outside the financial system but triggered a severe real-economy shock, leading to unprecedented fiscal and monetary responses. This paper examines how these policy interventions affected the use of LLPs for income smoothing among commercial banks in the European Economic Area (EEA). Specifically, we test the **COVID-crisis smoothing hypothesis**, which predicts that public fiscal and monetary interventions increased banks' incentives to smooth earnings during the pandemic. In addition, we evaluate whether larger policy support packages were associated with a decline in LLP levels, reflecting improved borrower solvency and reduced expected credit losses.

Recent studies have explored the impact of the COVID-19 crisis on bank profitability, stock returns, and credit risk (Berger and Demirgüç-Kunt 2021; Demir and Danisman 2021; Duan et al. 2021; Elnahass et al. 2021; Silva et al. 2023), as well as on provisioning behavior (Degryse and Huylebroek 2023; Hansen, Charifzadeh, and Herberger 2024). However, few have analyzed whether the scale of public support fiscal or monetary altered banks' incentives for discretionary provisioning. Fiscal interventions, such as liquidity guarantees and monetary measures under the European Central Bank's (ECB) Pandemic Emergency Purchase Programme (PEPP), were concentrated in countries facing deeper economic downturns (Wieland 2022; Demirgüç-Kunt, Horváth, and Huizinga 2023). These measures may have affected provisioning through two mechanisms: the crisis-severity channel, reflecting higher credit risk and deeper reductions in earnings in harder-hit economies, and the moral-hazard channel, where policy backstops reduced market discipline and expanded managerial discretion.

Using an unbalanced panel of 1,122 EEA banks for the period 2011–2020, we test whether income smoothing during COVID-19 was linked to the magnitude of fiscal and monetary interventions. We also assess whether the mitigating effect of public support on LLP levels, found in publicly traded banks (Degryse and Huylebroek 2023), applies generally to commercial banks. Fiscal support is proxied by government liquidity programs, and monetary easing is proxied by ECB asset purchases under PEPP (QE PEPP). Employing a random-effects model with bank-clustered robust errors, we find that both fiscal and monetary support reduced average LLP levels but simultaneously intensified the link between earnings and provisioning indicating stronger income smoothing in countries that received larger public support.

This study contributes to the literature in three ways. First, it integrates crisis-severity and moral-hazard channels to explain how stabilization policies shape banks' financial reporting behavior. Second, it extends evidence from Degryse and Huylebroek (2023) by including unlisted banks and explicitly modeling income smoothing, not just LLP levels. Finally, it situates fiscal and monetary support as key cross-country determinants of provisioning behavior, contributing to the ongoing debate on the unintended effects of large-scale policy interventions on the transparency of banks' financial reporting.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature and develops our hypotheses. Section 3 details our dataset and methodology. Section 4 presents the findings and robustness checks. Section 5 concludes.

Literature review and hypotheses

The use of loan loss provisions as a discretionary instrument for income smoothing is well established in the banking literature (Fonseca and González 2008; El Sood 2012; Bouvatier, Lepetit, and Strobel 2014; Skała 2020, 2021; Di Fabio, Ramassa, and Quagli 2021). While LLPs are intended to capture expected credit losses, they also serve as a tool for managing reported earnings and maintaining stability over time, particularly during periods of financial stress (Curcio, De Simone, and Gallo 2017; Ozili and Thankom 2018).

At the bank level, governance structures, ownership types, and market pressures shape the degree of managerial discretion in provisioning (Bouvatier, Lepetit, and Strobel 2014; Fan et al. 2019; Skała 2021). At the country level, regulation quality, investor protection, and accounting standards determine the transparency and prudential use of LLPs (Fonseca and González 2008; Gebhardt and Novotny-Farkas 2011; Olszak et al. 2025).

During crisis periods, provisioning behavior becomes more complex. Empirical studies find that downturns amplify the procyclicality of LLPs and increase incentives for income smoothing (El Sood 2012; Curcio, De Simone, and Gallo 2017; Ozili and Thankom 2018; Skała 2021). Banks tend to use discretionary provisions to mitigate earnings volatility, maintain capital ratios, and signal financial soundness to markets.

Existing research has also examined how crisis periods influence income smoothing. Most studies have focused on the Global Financial Crisis (GFC) (El Sood 2012; Curcio, De Simone, and Gallo 2017; Ozili and Thankom 2018; Pinto and Ng Picoto 2018; Kim, Kim, and Lee 2019; Simper, Dadoukis, and Bryce 2019; Di Fabio, Ramassa, and Quagli 2021). A large body of evidence confirms that crises – particularly the GFC – significantly affected the use of LLPs for income smoothing (Curcio, De Simone, and Gallo 2017; Ozili and Thankom 2018; Pinto and Ng Picoto 2018; Simper, Dadoukis, and Bryce 2019; Di Fabio, Ramassa, and Quagli 2021; Skała 2021).

Two Channels Linking Public Support and Bank Behavior during the COVID-19 Crisis

The COVID-19 crisis had a distinct nature, as it originated outside the financial system but caused profound economic disruptions. Its effects on banking activities depended largely on the severity of the pandemic's macroeconomic impact. Countries facing deeper recessions and higher corporate distress experienced stronger pressure on banks' asset quality and profitability. The severity of the crisis can be approximated by the scale of fiscal and monetary support measures aimed at economic recovery (Demirgüç-Kunt, Pedraza, and Ruiz-Ortega 2021). In Europe, they included government liquidity injections, borrower relief programs, and monetary easing. Such interventions helped cushion the shock to bank performance

and stabilize financial markets but also changed the relationship between economic downturns and provisioning decisions (Degryse and Huylebroek 2023; Nguyen et al. 2023).

Recent empirical evidence confirms that large-scale fiscal and monetary interventions mitigated immediate credit losses while simultaneously altering banks' incentives for discretionary provisioning, particularly in countries most affected by the pandemic (Degryse and Huylebroek 2023). These findings support the view that while public backstops can stabilize the banking sector in the short run, they may distort the risk–provisioning nexus by relaxing market discipline and allowing for greater managerial discretion.

The Crisis-Severity Channel

The first mechanism linking public support and bank behavior operates through the crisis-severity channel. The magnitude of fiscal and monetary interventions reflects the depth of the macroeconomic shock. Larger government spending and central bank interventions were concentrated in countries most severely hit by the pandemic, which also faced heightened credit risk and uncertainty.

Recent cross-country evidence supports this interpretation. Degryse and Huylebroek (2023) document that greater fiscal support – particularly through direct transfers and guarantees – was associated with lower LLP levels among listed banks, implying that public interventions improved borrower solvency and reduced provisioning needs. However, their study covers only publicly traded institutions and does not fully encompass the EEA banking sector, where smaller and unlisted banks may react differently to policy stimuli. Nguyen et al. (2023) find that banks significantly increased discretionary loan-loss provisions in the early stages of the pandemic but subsequently reduced overall LLP levels as fiscal and monetary support stabilized borrower solvency and restored economic confidence. Similarly, Allini et al. (2025) show that during downturns, banks actively use LLPs for earnings management, particularly under heightened uncertainty, confirming the procyclical and discretionary nature of provisioning in times of stress.

In Europe, the forward-looking design of IFRS 9 amplified this dynamic. As demonstrated by Hansen, Charifzadeh, and Herberger (2024), expected credit loss models increased the sensitivity of LLPs to macroeconomic fluctuations, making banks' provisioning behavior more responsive to the depth of the downturn and the accompanying policy interventions. Complementary evidence from Augeraud-Véron, Boungou, and Gupta (2025) indicates that better-capitalized banks recovered faster from pandemic shocks, suggesting that fiscal and monetary responses improved resilience but did not eliminate cyclical pressures on provisioning.

Overall, the scale of fiscal and monetary support captured both the intensity of the crisis and the extent of public stabilization efforts. In countries with stronger government and central bank interventions, banks faced heightened incentives to smooth earnings in response to volatility, while average provisioning levels declined due to policy-driven improvements in credit conditions (Degryse and Huylebroek 2023).

The Moral-Hazard Channel

The second mechanism operates through the moral-hazard channel, emphasizing behavioral adjustments to extensive public support. When governments and central banks implement large-scale liquidity programs, credit guarantees, and asset purchases, banks may perceive a reduced risk of insolvency and weaker market discipline. This perception can increase managerial discretion and encourage opportunistic income-smoothing practices.

Evidence from earlier crises and recent studies supports this concern. For example, Allini et al. (2025) highlight that in periods of downturn and abundant policy intervention, banks are more likely to manipulate LLPs to stabilize reported earnings. Similarly, Ma and Lan (2025) find that monetary policy shocks influence banks' provisioning behavior, with looser conditions reducing the sensitivity of LLPs to credit risk. These findings imply that accommodative policies while stabilizing the financial system – may unintentionally promote greater discretion in provisioning decisions.

Fiscal guarantees, borrower relief programs, and quantitative easing under the ECB's PEPP effectively cushioned the immediate impact of the pandemic on credit risk. However, they may also have encouraged banks to delay loss recognition or strategically use LLPs to manage earnings. Consequently, in economies with higher levels of fiscal and monetary support, banks may exhibit both lower LLP ratios, reflecting improved borrower solvency, and stronger income-smoothing behavior, driven by increased managerial discretion.

Hypotheses Development

Both fiscal support and quantitative easing (QE) under PEPP were concentrated in countries most severely affected by the pandemic and linked to heightened economic uncertainty (Berger and Demirgüç-Kunt 2021). Consequently, the extent of income smoothing is expected to vary with the scale of fiscal and monetary support, which simultaneously reflects the severity of the crisis and the potential for moral hazard. Accordingly, we propose the following hypotheses regarding income smoothing:

Hypothesis H1. The scale of public fiscal support is positively associated with income smoothing through LLPs during the COVID-19 crisis.

Hypothesis H2: The scale of monetary support (QE under PEPP) is positively associated with income smoothing through LLPs during the COVID-19 crisis.

Consistent with Degryse and Huylebroek (2023), who find that greater policy intervention reduced provisioning needs while maintaining managerial flexibility in earnings management, we also expect that public support will be linked to the levels of loan-loss provisions:

Hypothesis H3: Higher overall public support fiscal and monetary is associated with lower levels of LLPs.

Methods and data description

Model of loan loss provisions

Our baseline model describes links between LLPs of bank *i* at time *t* in country *c*. It is based on several previous research studies, including Fonseca and González (2008), Skała (2020; 2021), and Olszak et al. (2025), with modifications as in Beatty, Ke, and Petroni (2002), Fan et al. (2019) and Di Fabio et al. (2021). To empirically evaluate our hypothesis H1 that the intensity of income-smoothing during the coronavirus pandemic crisis depends on the fiscal and monetary response (Policy response), we use Equation 1 below:

$$LLP_{i,c,t} = \alpha + \beta_1 ProfitBPT_{i,c,t} + \beta_2 \left(ProfitBPT_{i,c,t} \times Crisis \times PolicyResponse\right) + \beta_3 PolicyResponse + \delta \times BSOCV_{i,c,t} + \mu_i + \nu_{i,t}, \quad (1)$$

where $LLP_{i,c,t}$ is the ratio of loan loss provisions to total assets for bank i in country c and year t; μ_i captures unobserved, time-invariant bank-specific heterogeneity, and $\nu_{i,t}$ is the idiosyncratic error term.

The key coefficient of interest, β_2, captures how income smoothing (proxied by the sensitivity of LLPs to pre-provision earnings) varies with the scale of fiscal or monetary support during the COVID-19 crisis. The variable *PolicyResponse* represents the intensity of government or central bank interventions. Fiscal support is measured as the ratio of total liquidity assistance to GDP, while monetary support corresponds to the share of asset purchases under PEPP relative to total government debt. Higher values of these ratios indicate both greater crisis severity and more extensive stabilization measures.

A positive β_2 would suggest that banks in countries with larger policy interventions exhibited stronger income smoothing, consistent with both the **crisis-severity channel** (heightened macroeconomic stress leading to greater earnings management) and the **moral-hazard channel** (reduced market discipline encouraging discretionary provisioning). Conversely, a negative β_2 would imply that expansive fiscal or monetary support dampened smoothing behavior, possibly by improving borrower solvency and reducing credit risk.

The coefficient β_3 reflects the direct effect of public interventions on the level of LLPs. Following Degryse and Huylebroek (2023), we expect fiscal measures to be negatively related to LLPs, as government support to non-financial borrowers mitigated loan impairment risk. For monetary policy (PEPP), the expected sign is also negative if quantitative easing alleviated liquidity stress and corporate debt burdens.

The vector $BSOCV_{i,c,t}$ includes standard bank-specific and macroeconomic controls commonly used in LLP studies (e.g., Fonseca and González 2008; Skała 2021; Olszak et al. 2025): ΔLoans – annual rate of loans growth; LLR – loan loss reserve; CapRATIO – capital funds divided by total assets; Loans – loans to total assets; Bank Size – natural logarithm of total assets; NPL – non-performing loans divided by gross loans; Unemployment – unemployment rate; GDPG – real GDP growth rate; Crisis – a dummy variable equal to 1 for 2020, which captures the pandemic shock.

This model design allows us to isolate the moderating effect of fiscal and monetary policy on income smoothing through LLPs, which is consistent with the theoretical expectations derived from both the crisis-severity and moral-hazard channels.

Endogeneity and estimation method

To address potential endogeneity, several preventive measures are implemented. First, to reduce the risk of measurement error, variable definitions for both dependent and explanatory variables follow standard practice in the LLP literature. We also include all banks available in the Orbis database and winsorize variables at the 1st and 99th percentiles to mitigate the influence of outliers. Second, to minimize omitted variable bias, we employ a specification widely used in prior loan loss provisioning research (Fonseca and González 2008; Olszak et al. 2018; Fan et al. 2019; Di Fabio et al. 2021; Skała 2021), thereby ensuring consistency with established empirical frameworks. Third, to limit simultaneity bias between LLPs and profitability measures, income statement items are normalized by lagged total assets. Since our unbalanced panel includes bank-level variables that may be correlated over time, we further control for potential autocorrelation and heteroskedasticity by applying robust standard errors clustered at the bank level.

Our primary estimation method is the random-effects (RE) model with bank-clustered robust standard errors. This choice is justified on both theoretical and statistical grounds. The COVID-19 crisis constitutes an exogenous macroeconomic shock, while country-level variables such as fiscal and monetary policy measures are exogenous to individual bank operations. The RE estimator is also suitable for our data structure, as it enables the inclusion of time-invariant country-level variables that would be absorbed by fixed effects.

Following Mundlak (1978) and Baltagi (2005), the RE specification assumes that all regressors are exogenous with respect to unobserved individual effects. In our context, certain bank-specific factors may be endogenous to LLPs, whereas macroeconomic indicators, fiscal and monetary policy responses, and institutional characteristics can reasonably be treated as exogenous. Based on standard specification diagnostics – the Hausman test, Breusch-Pagan Lagrangian multiplier test, and the robust Hausman test – we find no evidence of correlation between individual effects and regressors. Accordingly, the random-effects estimator with bank-clustered robust standard errors is adopted (Bell and Jones 2015; Bell, Fairbrother, and Jones 2018).

This estimation strategy enables direct testing of the hypotheses formulated in Section 2.2, linking banks' income-smoothing behavior to the scale of fiscal and monetary support during the COVID-19 pandemic.

Data description

Bank level and macroeconomic data

We compile data from multiple sources. Bank-level variables are drawn from Bank Orbis Focus, which comprises annual balance sheet and income statement information for over 1,000 banks (6,835 observations) across 29 European Economic Area countries between 2011 and 2020. The initial dataset covered more than 2,000 banks and 16,000 observations; to mitigate the influence of extreme values, variables are winsorized at the 1st and 99th percentiles. Due to the limited

availability of loan loss reserves (LLR) and non-performing loans (NPL), the final sample includes 1,122 banks and ends in 2020, focusing on the year when the COVID-19 pandemic shock was the most severe (see Table 1).

We must also admit that some banks in non-euro EEA countries applied LLPs to account for potential legal claims related to CHF-denominated mortgage loans (e.g., in Poland since 2019). These provisions, initially intended to address legal and reputational risks, were subsequently treated as an additional safety buffer during the pandemic. This practice may have temporarily increased reported resilience and reduced provisioning volatility, yet it also complicates cross-country comparability. In particular, pre-existing legal risk provisions may have interacted with pandemic-related adjustments, influencing the observed relationship between LLPs and fiscal or monetary policy responses.

As our objective is to examine the influence of country-specific characteristics on income smoothing, we use unconsolidated data to ensure that financial indicators reflect domestic rather than consolidated group effects. Macroeconomic variables – unemployment rate and GDP growth – are sourced from the International Monetary Fund's World Economic Outlook database.

Fiscal and monetary policy support data

The most comprehensive source of fiscal support data during the COVID-19 pandemic is the IMF's Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic (Niermann and Pitterle 2021). This database summarizes key fiscal measures announced or implemented by selected economies in response to the crisis, classifying them into three categories with distinct short- and long-term budgetary implications (IMF 2021): (i) additional spending or one-off tax measures; (ii) tax deferrals; and (iii) guarantees or liquidity support to firms in financial distress.

Our analysis focuses on the third category. Fiscal support, primarily in the form of liquidity guarantees, loan moratoria, and direct subsidies to the non-financial corporate sector, was designed to sustain firm solvency and household income during the lockdown-induced recession. Larger fiscal packages were implemented in countries that faced more severe pandemic-related output losses and higher business vulnerability. Consequently, the scale of fiscal support reflects both the depth of the crisis and the extent of government intervention aimed at stabilizing credit markets.

From a banking perspective, fiscal transfers and guarantees directly improved borrower repayment capacity and reduced expected credit losses, thereby lowering LLP levels (Degryse and Huylebroek 2023). However, as these policies softened the link between actual credit risk and provisioning, they may also have amplified income-smoothing behavior, as managers exercised greater discretion to maintain stable earnings in an uncertain environment. Such measures directly influence banks' credit portfolio quality by reducing firm defaults, thereby affecting loan loss provisions and profitability. Fiscal support is proxied by liquidity support as a share of GDP (hereafter, **government fiscal support level**). On average, liquidity support in EEA countries amounted to over 13% of GDP, with substantial cross-country variation (standard deviation: 10.61%) (see Table 1).

In parallel, the ECB launched PEPP, a quantitative easing measure designed to counter severe disruptions in monetary policy transmission and the economic outlook (Demirgüç-Kunt, Horváth, and Huizinga 2023). Initially set at €750 billion, PEPP was later expanded to €1850 billion – equivalent to 15.4% of 2019 Euro Area GDP (Wieland 2022). Eligible private debt instruments were euro-denominated, investment-grade securities issued by non-bank firms in the euro area. Large-scale purchases of government securities under PEPP, together with those by national central banks, effectively monetized a substantial share of the pandemic-induced increase in public debt (Wieland 2022). In contrast to government interventions, PEPP represented an extraordinary monetary intervention aimed at restoring monetary policy transmission and preventing financial fragmentation across the euro area (European Central Bank 2020). The ECB deliberately applied flexibility in asset purchases, allocating a disproportionate share to countries experiencing stronger financial and economic distress (e.g., Italy, Spain, and Greece). PEPP thus served as both a stabilization mechanism and an indicator of crisis severity, as larger purchases were concentrated in economies under greater pressure. By improving liquidity in sovereign and corporate bond markets and lowering borrowing costs, PEPP reduced immediate market stress for banks but may also have encouraged moral hazard, as perceived credit and funding risks declined. We assess PEPP's role using the share of net PEPP purchases in government debt as of 2020 for each euro area country. The average share was 6.9%, with notable dispersion (standard deviation: 1.37%).

Table 1. Variable names, definitions, mean values and data sources

Variable	Definition	Mean	#Obs	#Banks	Source
Fiscal and liquidity support variables:					
Fiscal support level	Covid-19 Liquidity Support as a % of GDP	13.13	1122	1122	IMF
QE PEPP	ECB Net PEPP purchases as a % of government debt purchased	6.90	787	787	ECB, Eurostat.
Fiscal support: Equity injections and loans	COVID19 Liquidity Equity and Loan as a % of GDP	1.47	1122	1122	IMF
Fiscal support - guarantees	COVID19Liquidity Guarantees as a % of GDP	11.95	1122	1122	IMF
Country level PEPP to total PEPP	COVID19 ECB net purchases % of Total PEPP	13.31	787	787	ECB, Eurostat.
Bank-level and other control variables					
LLP	LLP/ lagged total assets (in %)	0.23	6835	1122	BankOrbisFocus
ProfitBPT	(Profit before taxes and LLP)/lagged total assets (in %)	1.36	6835	1122	BankOrbisFocus
ΔLoans	Loans growth rate (in %)	4.03	6835	1122	BankOrbisFocus
LLR	LLR/total assets (in %)	2.32	6835	1122	BankOrbisFocus
CapRATIO	Total capital/total assets (in %)	20.53	6835	1122	BankOrbisFocus
Loans	Loans/total assets (in %)	57.58	6835	1122	BankOrbisFocus
Bank Size	ln(Total assets)	14.80	6835	1122	BankOrbisFocus
NPL	Nonperforming loans / Total gross loans (in %)	6.73	6835	1122	BankOrbisFocus
Unemployment	unemployment rate	8.00	6835	1122	WEO, IMF

Variable	Definition	Mean	#Obs	#Banks	Source
GDPG	real GDP growth rate	1.08	6835	1122	WEO, IMF
Crisis	Dummy = 1 in the COVID-19 crisis period	0.10	1122	1122	Authors' own elaboration

Source: authors' elaboration using the datasets referred to in the table.

Figure 1 illustrates the substantial cross-country variation in fiscal liquidity support implemented during the COVID-19 pandemic across the EEA. The magnitude of fiscal interventions varied widely – from over 35% of GDP in Italy and 27.8% in Germany, to below 3% in Ireland, Austria, and Croatia – indicating pronounced asymmetry in governments' fiscal capacities and policy responses. The European Union (EU) average amounted to approximately 8% of GDP, with notable regional patterns: Central and Eastern European (CEE) countries provided smaller packages (around 5% of GDP), reflecting more limited fiscal space, while euro area members implemented larger interventions (around 9% of GDP) supported by EU-level mechanisms and stronger fiscal buffers. In line with the crisis-severity channel, these differences capture both the unequal macroeconomic impact of the pandemic and the varying ability of governments to stabilize the financial sector. Countries with higher fiscal support generally experienced more severe pandemic shocks, prompting stronger countercyclical measures. From a banking perspective, such fiscal interventions likely reduced expected credit losses and, consistent with Degryse and Huylebroek (2023), contributed to lower LLP levels. However, the scale of fiscal aid also shaped banks' reporting behavior: extensive public support may have softened market discipline and created conditions conducive to income smoothing, as managers exercised greater discretion to maintain stable earnings under uncertainty.

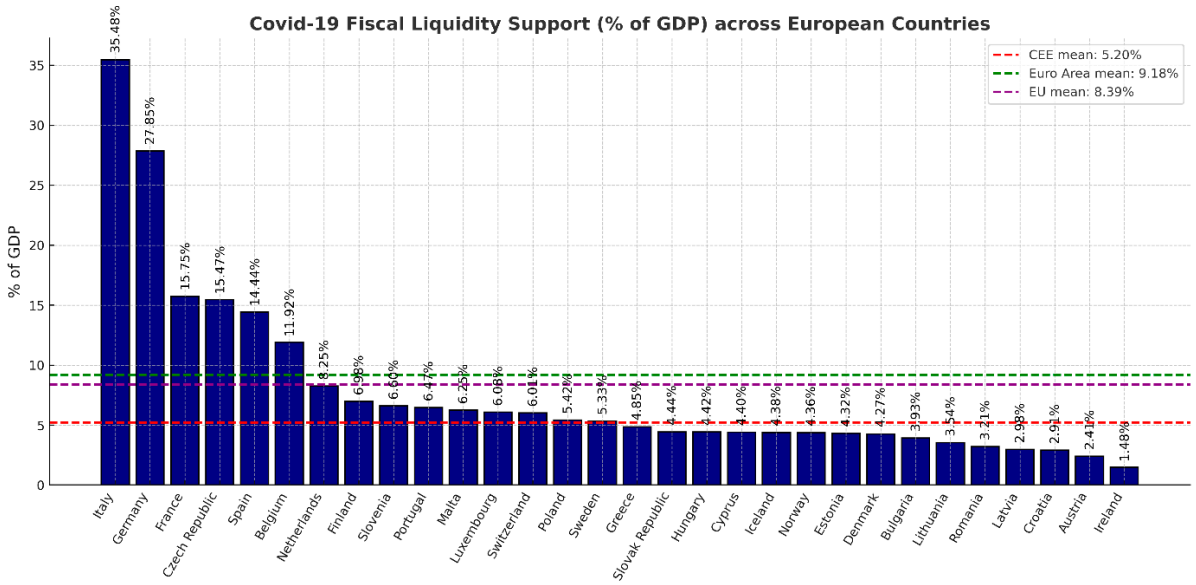

Figure 1. The share of the COVID-19 crisis fiscal liquidity support targeted at non-financial firms (as a % of GDP) in EEA countries

Source: authors' elaboration using IMF Fiscal Monitor: Database of Country Fiscal Measures in Response to the COVID-19 CRISIS Pandemic (IMF 2021).

Figure 2 presents the distribution of PEPP purchases across euro area countries, measured as a share of national government debt. The euro area average stood at approximately 6.9%, represented by the horizontal dashed line. The highest relative support under PEPP was observed in the Netherlands, Slovakia, and Slovenia (each around 10%), followed by Lithuania (9%), Germany and Luxembourg (8%). In contrast, Malta and Estonia recorded the lowest ratios (4%), while Belgium, France, Italy, and Portugal remained close to or below the euro area average. This pattern reflects the targeted nature of monetary intervention under PEPP, which was implemented with flexibility to direct purchases toward countries experiencing greater financial and economic stress. As such, higher PEPP allocations signal greater crisis severity and the ECB's effort to prevent market fragmentation and support credit flows in vulnerable economies. Within the framework of this study, the scale of PEPP purchases represents a complementary dimension of public intervention capturing the monetary policy response to crisis intensity and serves as an additional determinant of banks' provisioning and income-smoothing incentives. In line with the moral-hazard channel, extensive QE support may have reduced perceived credit and liquidity risk, encouraging managerial discretion in the use of LLPs for earnings management.

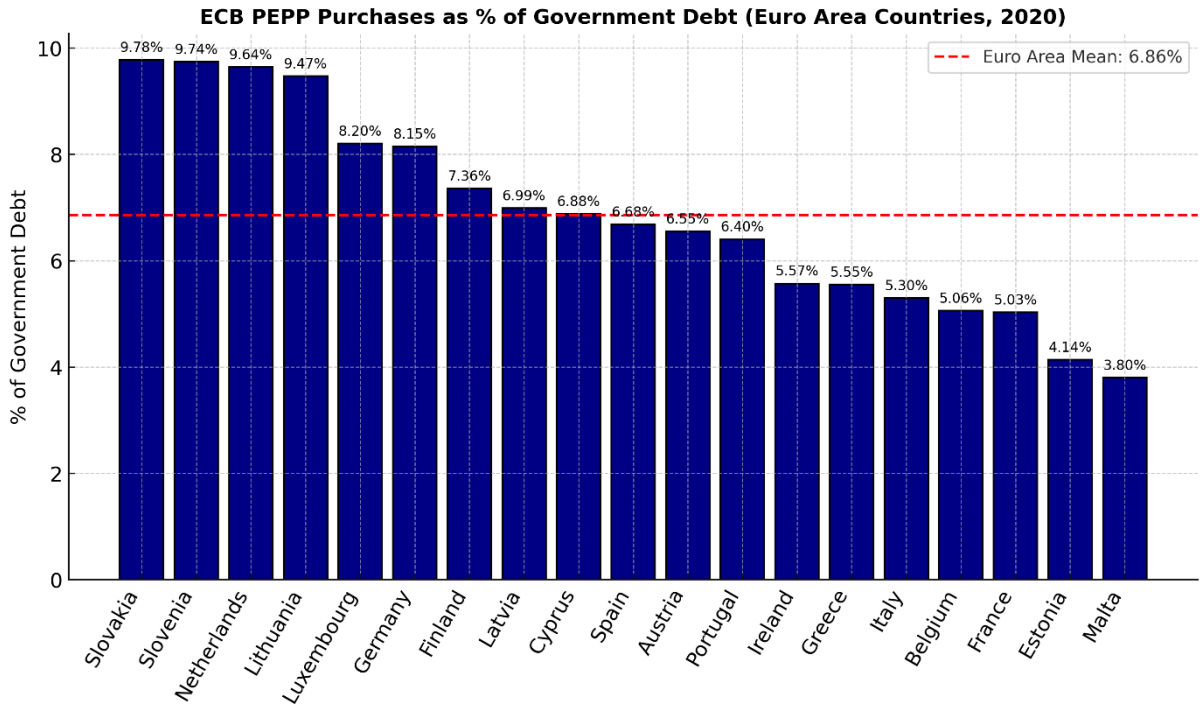

Figure 2. The QE via PEPP (as a % of total government debt) during the COVID-19 crisis in Euro Area countries
Source: Eurostat, ECB, authors' calculations.

Empirical results of the role of fiscal and monetary support

Table 2 presents the random-effects estimates that link fiscal and monetary interventions to banks' income-smoothing behavior during the COVID-19 crisis. The coefficient for *ProfitBPT* is positive and highly significant, confirming that banks used LLPs to stabilize earnings,

which is consistent with prior European evidence (Fonseca and González 2008; Skała 2021; Di Fabio et al. 2021).

The interaction *ProfitBPT* × *Crisis* × *Fiscal support* is positive and significant (0.005, $p < 0.01$), supporting H1 and showing that income smoothing intensified in countries with larger fiscal packages – averaging 13.1% of GDP (Table 1). This supports the crisis-severity channel, as higher fiscal spending reflected deeper economic distress and greater incentives for banks to buffer earnings volatility. The negative direct effect of fiscal support (–0.006, $p < 0.01$) confirms H3, indicating that fiscal measures lowered overall LLP levels by improving borrower solvency and credit quality, consistent with Degryse and Huylebroek (2023).

The interaction *ProfitBPT* × *Crisis* × *QE PEPP* is also positive and significant (0.011, $p < 0.05$), supporting H2. This suggests that the ECB's PEPP amplified income-smoothing behavior by easing funding pressures and enhancing banks' ability to manage earnings. At the same time, the negative coefficient on *QE PEPP* (–0.018, $p < 0.01$) reveals that monetary easing substantially reduced LLP levels, as stated in H3. This suggests that while QE improved liquidity and reduced expected credit losses, it also increased managerial discretion over provisioning decisions – reflecting a moral hazard effect. Thus, the liquidity benefits of PEPP simultaneously stabilized balance sheets and encouraged more flexible income-smoothing practices.

Comparatively, the marginal effect of monetary easing on income smoothing (0.011) is about twice as large as that of fiscal support (0.005), suggesting that QE provided greater scope for discretionary provisioning. Overall, the results reveal a dual effect of public interventions: they mitigated credit risk and stabilized banks (crisis-severity channel) but also fostered moral hazard by encouraging greater discretion in LLP use.

The results highlight an important trade-off between stabilization and prudential transparency in bank reporting. While large-scale fiscal and monetary interventions successfully reduced systemic risk, they may have indirectly encouraged income-smoothing practices that obscure the true timing of credit losses. These findings emphasize the need for supervisors to closely monitor provisioning behavior during and after crisis-related support programs, particularly in jurisdictions where public interventions were most extensive.

Table 2. Crisis-induced income smoothing–the role of fiscal support and the QE PEPP policy

Dependent variable: LLP	Governments' fiscal support level (as s % of GDP)	The ECB Pandemic Emergency Purchase Program (as a % of government debt purchased)
	1	2
ProfitBPT	0.194***	0.195***
	(0.023)	(0.023)
ProfitBPT × **Crisis × Fiscal support**	**0.005*** **	
	(0.002)	
ProfitBPT × **Crisis × QE PEPP**		**0.011****
		(0.006)

Dependent variable: LLP	Governments' fiscal support level (as s % of GDP)	The ECB Pandemic Emergency Purchase Program (as a % of government debt purchased)
	1	2
Fiscal support	−0.006***	
	(0.001)	
QE PEPP		−0.018***
		(0.005)
ΔLoans	−0.001	−0.001
	(0.001)	(0.001)
LLR(t − 1)	0.002	0.003
	(0.014)	(0.014)
CapRATIO(t − 1)	0.001	0.001
	(0.001)	(0.001)
Loans	0.005***	0.005***
	(0.001)	(0.001)
Bank Size	0.002	0.002
	(0.008)	(0.008)
NPL	0.027***	0.027***
	(0.005)	(0.005)
Unemployment	0.048***	0.047***
	(0.006)	(0.006)
GDPG	−0.034***	−0.036***
	(0.004)	(0.004)
Constant	−0.705***	−0.694***
	(0.141)	(0.142)
R-squared	0.187	0.185
#Observations	6835	6835
#Banks	1122	1122

Notes: This table displays the tests of hypotheses H1, H2, and H3. *LLP* – loan loss provisions scaled by total assets from year *t* − 1. *ProfitBPT* – denotes income before taxes and loan loss provision scaled by total assets from year *t* − 1. *Fiscal support* – denotes government liquidity support to non-financial corporations and enterprises (in % of GDP); *QE PEPP* denotes the net levels of Pandemic Emergence Purchase Program delivered by ECB quantitative easing (in % of total government debt). Control variables are the same as in Table 2. Robust standard errors are included in brackets. The coefficients are estimated with a random effects estimator. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Source: authors' analysis.

Regarding the other control variables, we find support for the view that banks with bigger loan portfolios tend to set aside higher levels of loan loss provisions. We also find evidence for the procyclicality of LLPs denoted by a negative coefficient on GDPG and a positive coefficient

on Unemployment, in line with previous research (Fonseca and González 2008; Skała 2020; 2021; Olszak et al. 2025). The positive coefficient on NPL further suggests that higher non-performing loan ratios are associated with greater provisioning needs, reflecting the credit risk sensitivity of LLPs. This indicates that a substantial portion of LLPs represents justified, non-discretionary adjustments for realized or anticipated credit losses.

Sensitivity analysis

To assess the robustness of our main findings and hypotheses H1–H3, we perform several sensitivity analyses that incorporate additional liquidity controls and alternative measures of fiscal and monetary support. Liquidity conditions are especially relevant in crisis periods, as they can influence provisioning behavior and banks' capacity to absorb shocks.

Columns (1)–(2) of Table 3 introduce the Loans-to-Deposits ratio (LtD) and the Liquidity Ratio (liquid assets to total assets) into the baseline regressions. The coefficients on these liquidity variables are statistically significant but do not materially alter the key relationships. The interaction terms for ProfitBPT × Crisis × Fiscal support and ProfitBPT × Crisis × QE PEPP remain positive and significant, confirming that income smoothing intensified in response to larger fiscal and monetary interventions, consistent with H1 and H2. Thus, our core result – that public support magnified income-smoothing incentives during the pandemic – holds even after accounting for banks' individual liquidity positions.

Next, we decompose fiscal support into its equity injections, loans, and guarantee programs (columns 3–4), and we replace the country-level QE variable with the national share in total PEPP purchases (column 5). The results remain robust: both equity- and guarantee-based fiscal measures are associated with stronger income smoothing and lower LLP levels, reaffirming H1 and H3. Likewise, the alternative PEPP measure yields similar positive interaction effects on income smoothing and negative effects on provisioning, supporting H2.

Overall, the robustness checks confirm that our findings are not driven by liquidity heterogeneity or measurement choice. Across specifications, higher fiscal and monetary support continues to amplify the income-smoothing response while reducing overall provisioning levels. These patterns reinforce both the **crisis-severity channel** where larger policy interventions reflect deeper economic distress – and the **moral-hazard channel**, through which policy backstops expand managerial discretion in LLP-based earnings management.

Table 3. Robustness check of the effect of pandemic severity on income-smoothing

	Governments' fiscal support level (as s % of GDP)	The ECB Pandemic Emergency Purchase Program (as a % of government debt purchased)	Fiscal support: Equity injections and loans	Fiscal support – guarantees	Country level PEPP to total PEPP
Variables	**1**	**2**	**3**	**4**	**5**
			$LLP_{(t-1)}$		
ProfitBPT	0.210***	0.212***	0.196***	0.194***	0.194***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.023)
ProfitBPT × Crisis × Fiscal support	**0.004****		**0.032***	**0.005****	
	(0.002)		**(0.016)**	**(0.002)**	
ProfitBPT × Crisis × QE PEPP		**0.009**			**0.007****
		(0.006)			**(0.003)**
Fiscal support	−0.005***		−0.027**	−0.007***	
	(0.001)		(0.013)	(0.002)	
QE PEPP		−0.016***			−0.005***
		(0.005)			(0.002)
$Liquidity\ ratio_{(t-1)}$	−0.299***	−0.295***			
	(0.093)	(0.093)			
$LtD_{(t-1)}$	−0.002	−0.002			
	(0.002)	(0.002)			
Control variables	yes	yes	yes	yes	yes
Estimator	RE	RE	RE	RE	RE
#Observations	6167	6167	6835	6835	6835
#Banks	1044	1044	1122	1122	1122

Notes: This table displays the test of hypotheses H1 to H3. *LLP* – loan loss provisions scaled by total assets from year *t* – 1. *ProfitBPT*– denotes income before taxes and loan loss provision scaled by total assets from year *t* – 1. *Fiscal support* – denotes government liquidity support to non-financial corporations and enterprises (in % of GDP); *QE PEPP* denotes the net levels of Pandemic Emergence Purchase Program delivered by ECB quantitative easing (in % of total government debt). *ProfitBPT × Crisis × Fiscal support* - denotes the effects of Fiscal Support on income smoothing during the COVID-19 crisis period. *ProfitBPT × Crisis× QE PEPP* – denotes the effects of *QE PEPP* on income smoothing in the COVID-19 crisis period. *Liquidity ratio* is a ratio of liquid assets over liabilities. *LtD* is a loans to deposits ratio. Control variables are the same as in Table 2. Robust standard errors are included in brackets. The coefficients are estimated with a random effects estimator or a dynamic 2-step system GMM. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Source: authors' analysis.

Conclusions

This study investigates income smoothing through loan-loss provisions (LLPs) among commercial banks in the European Economic Area (EEA) during the COVID-19 crisis, focusing on the role of public fiscal and monetary interventions. Using fiscal liquidity measures and the European Central Bank's Pandemic Emergency Purchase Programme (PEPP) as proxies for policy responses, we find that both types of intervention significantly shaped banks' provisioning behavior.

The results indicate that income smoothing intensified in countries with larger fiscal and monetary support, while overall LLP levels declined. These findings suggest a dual mechanism. First, consistent with the crisis-severity channel, greater public spending reflected deeper economic stress and stronger incentives for banks to stabilize earnings amid elevated credit risk. Second, through the moral-hazard channel, extensive policy backstops particularly QE liquidity may have relaxed market discipline and increased managerial discretion in provisioning decisions.

Overall, the evidence supports the **COVID-crisis smoothing hypothesis**: fiscal and monetary interventions mitigated credit losses but simultaneously encouraged greater use of LLPs for earnings management. These results highlight an important policy trade-off. While large-scale stabilization measures helped preserve financial stability, they may have reduced prudential transparency by masking true credit risk. Future research should explore whether similar behavioral patterns persist once policy support is withdrawn and assess the implications for supervisory oversight under prolonged macro-financial intervention regimes.

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Wsparcie fiskalne, luzowanie ilościowe (QE) i wygładzanie dochodów w europejskich bankach podczas kryzysu związanego z COVID-19

W badaniu podjęto próbę określenia, w jaki sposób reakcje polityki fiskalnej i monetarnej na kryzys związany z pandemią COVID-19 wpłynęły na wygładzanie dochodów przez banki w krajach Europejskiego Obszaru Gospodarczego (EOG). Wykorzystując dane panelowe obejmujące 1122 banki komercyjne z 29 krajów w latach 2011–2020, autorzy badają, czy intensywność wygładzania dochodów różniła się w zależności od skali wsparcia publicznego. Miary wsparcia fiskalnego w zakresie płynności oraz luzowanie ilościowe (QE) Europejskiego Banku Centralnego w ramach Pandemic Emergency Purchase Programme (PEPP) służą jako miara skali interwencji rządowych i monetarnych. Wyniki wskazują, że zarówno wsparcie fiskalne, jak i monetarne obniżyło przeciętny poziom rezerw na ryzyko kredytowe (LLP), ale jednocześnie wzmocniło zależność między dochodami operacyjnymi a wielkością tworzonych LLP, co sugeruje nasilenie zjawiska wygładzania dochodów w czasie pandemii. Wzorzec ten odzwierciedla dwa uzupełniające się mechanizmy: kanał dotkliwości kryzysu, w którym większe interwencje polityczne odpowiadały głębszym zaburzeniom gospodarczym, oraz kanał pokusy nadużycia, w którym publiczne zabezpieczenia zwiększały swobodę menedżerów w kształtowaniu rezerw. Wyniki sugerują, że szeroko zakrojone działania stabilizacyjne ograniczyły ryzyko kredytowe i przyczyniły się do utrzymania stabilności finansowej, ale jednocześnie sprzyjały bardziej uznaniowym praktykom rachunkowym, co wskazuje na potencjalne napięcie między skutecznym zarządzaniem kryzysem a przejrzystością raportowania finansowego banków.

Słowa kluczowe: rezerwy na straty kredytowe, wygładzanie dochodów, wsparcie płynności