Bulletin
de la Banque de France

JANUARY-FEBRUARY 2026

262/1 RESEARCH

Forecasting bank lending rates

Bank lending rates directly influence economic decisions. It is therefore essential to have reliable forecasts of how they will evolve. This article presents an effective method for forecasting new lending rates for households and businesses in France and the euro area. It is based on an autoregressive model augmented with the predictive content of market interest rates at different horizons, which reflect expectations of future short-term rates. Incorporating this information improves the accuracy of forecasts by an average of 36% compared to a purely autoregressive model, which forecasts future loan rates based solely on past values. This approach is particularly relevant for forecasting trend reversals, which the purely autoregressive model does not take into account due to its inertia.

Jean Barthélémy, Grégory Levieuge, Rose Portier
Monetary and Financial Analysis Directorate

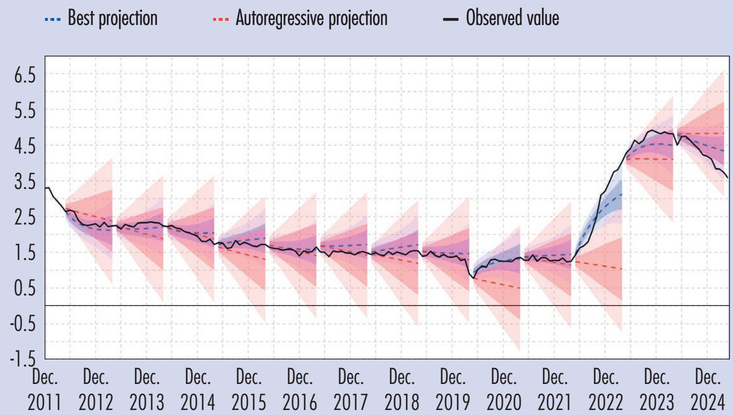
JEL codes
C53, E43,
G21

The views expressed in this article are those of the authors and do not necessarily reflect those of the Banque de France or the Eurosystem. Any errors or omissions are the responsibility of the authors. The authors would like to thank Hugues Dastarac, Tommaso Gasparini, Guillaume Horny, and Sophie Guilloux-Nefussi, who have worked on this forecasting model on various occasions.

36%
on average, the best models augmented with the most relevant market rate for each type of lending rate improve forecast accuracy by 36% compared to purely autoregressive models.
This is largely due to a better ability to forecast trend reversals.

1 to 12-month forecasts for rates on new loans to French businesses: best model vs. purely autoregressive model

(%)



Sources: Bloomberg, European Central Bank (MIR data), authors' calculations.
Note: The black curve corresponds to actual rates on new loans to French businesses. The red dotted lines represent the forecasts of the purely autoregressive model, starting in May of each year, over 1 to 12-month horizons. The blue dotted lines represent the forecasts of the model that also incorporates information on 2-year market rates. The forecast interval is ± 2 mean squared errors.

BANQUE DE FRANCE
EUROSYSTÈME

Our economic decisions are influenced by our expectations, particularly with regard to bank lending rates. Whether you are an individual considering a real estate project or a business leader seeking to invest (or seeking to predict the cost of refinancing your maturing debt), one key question arises: should you borrow today or wait for rates to fall?

But can we really forecast changes in bank lending rates? This article answers that question in the affirmative. We show that borrowing rates can be forecasted using the information content of interest rates observed on financial markets, available in real time.

The ability to forecast changes in lending rates is also key for central banks. On the one hand, it enables them to analyse the transmission of monetary policy to lending by identifying what remains to be transmitted from past decisions. Since changes in key rates take time to be passed on to lending rates, and since "governing means anticipating", forecasting rate changes makes it possible to estimate the monetary impulse still being transmitted. On the other hand, forecasting lending rates helps central banks refine future decisions by assessing future financial conditions. Exogenous factors—such as high long-term rates due to strong economic uncertainty—can lead to higher lending rates, lower demand for loans, and ultimately weigh on growth and employment.

To forecast changes in lending rates, one approach is to rely on surveys conducted among banks, such as the Bank Lending Survey. Another approach aims to look at how lending rates are set using granular microeconomic data (Baptista et al., 2025). In this article, we adopt a complementary approach based on an autoregressive model augmented with market interest rates.

Our results show that, on average, the best models augmented with the most relevant market rate for each type of borrowing rate improve the accuracy of forecasts up to one year by 36% compared to purely autoregressive models, in which future lending rates are projected solely on the basis of their past values. What is particularly interesting is that our model is able to detect turning points, i.e., changes in trends, fairly accurately even before the first observed data signal a reversal. This performance can be explained both by the slow adjustment of lending rates and by the close link between borrowing rates and market rates, which serve as a reference for banks' lending policy.

This article is divided into three parts. The first part shows that rates on new loans are closely linked to market rates. The second part details our methodology and the criteria used to assess forecasts' performance. The third part presents the results obtained using these simple and effective models.

1 New loan rates and money market rates in France and the euro area

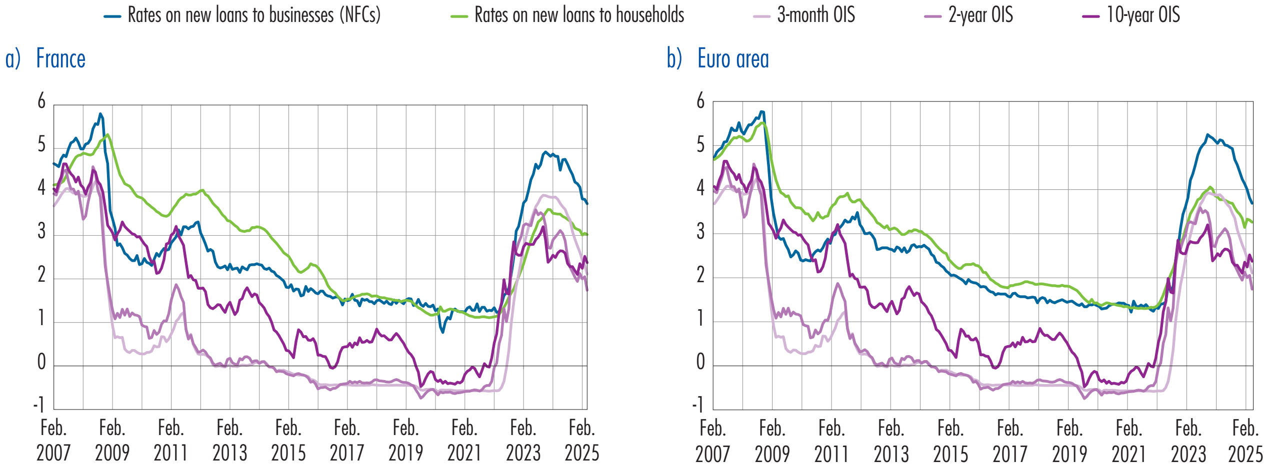
Commercial banks generally set their interest rates on the basis of market rates, for two main reasons. On the one hand, the latter are an indicator of their financing costs. On the other hand, they reflect the opportunity cost of choosing to lend rather than invest in financial markets. We use overnight index swap (OIS) rates at different horizons as market rates. An OIS is an interest rate swap between a fixed interest rate and the *compounded average of an overnight interbank rate* (i.e., in the euro area, the Eonia, then the €STR). The OIS rate reflects market expectations of short-term interest rate movements and serves as a benchmark for measuring the future cost of risk-free financing. We analyse the extent to which the information contained in these market rates helps to forecast the rates of new loans to households and businesses at different horizons.

Chart 1 below shows 3-month, 2-year, and 10-year OIS rates, as well as rates on new loans to households (real estate loans) and businesses in France (left) and the euro area (right). Since OIS rates generally precede movements in bank rates, they could serve as leading indicators of future financing conditions.[1] Rates on new household loans appear to be particularly linked to 10-year OIS rates, while rates on new business loans appear to be more closely correlated with 3-month and 2-year OIS rates. The episode in 2009 illustrates this distinction particularly well. The purpose of this article is precisely to assess the predictive value of these market rates in order to forecast bank lending rates.

1 This article does not analyse the differential between OIS rates and bank rates, but focuses exclusively on the covariation of these rates.

C1 OIS rates and rates on new loans to households and businesses

(%)



Sources: Bloomberg, European Central Bank (MIR data).
Notes: OIS (overnight index swaps) rates are the same for France and the euro area, while rates on new loans differ.
NFCs, non-financial corporations.

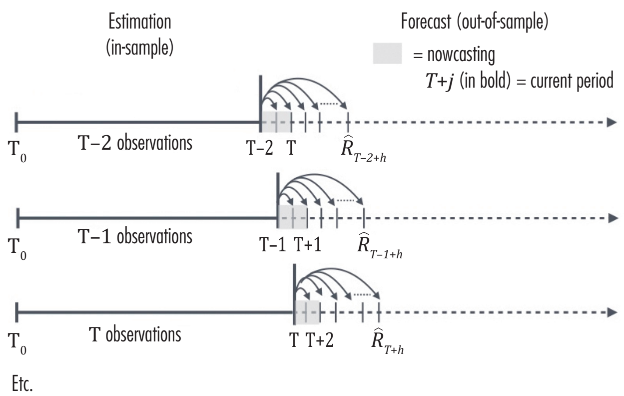
2 Methodology

Interest rate forecasting models are generally autoregressive models, adapted to their relative inertia[2] (De Bondt, 2005; Kok Sørensen and Werner, 2006; Hristov et al., 2014; Levieuge, 2017; Holton and Rodriguez d'Acri, 2018; Jude and Levieuge, 2024). However, these models have a major flaw: they are by definition unable to forecast cycle reversals. In order to combine inertial dynamics with the ability to capture turning points, we use an ARDL (auto-regressive distribution lag) model, augmented with market interest rate expectations contained in the OIS rate (see Box 1 below).

The model is used in a realistic forecasting framework, placing ourselves in the position of a forecaster in month T, with access only to the interest rates observed on that date. The estimation and forecasting process is shown in the diagram.

The model is first estimated on the data available up to date T. As data on lending rates are available with a two-month lag,[3] this estimate covers the period from T_0 (February 2007) to $T-2$. Based on this estimate, monthly out-of-sample forecasts are made for horizons h ranging from one to twelve months ahead, i.e., for periods $T-1$ to $T+10$. The forecasts made for $T-1$ and T, shaded in gray in the diagram, correspond to nowcasting.[4] This method is then replicated for a forecaster one month later, i.e., at $T+1$. The estimation sample is then broadened to include the information revealed in $T+1$, and the model is re-estimated over the period from T_0 to $T-1$. New out-of-sample monthly forecasts are made for horizons T to $T+11$.

Forecasting method diagram



Source: Authors.

2 In particular because many loans are fixed-rate loans with long maturities (see, for example, Baptista et al., 2025).
3 OIS rates are available in real time.
4 Real-time estimation of the current or recent economic situation, prior to the publication of final statistics, using immediately available data.

BOX 1

The auto-regressive distribution lag (ARDL) model with a long-term target

$$(1)\ \Delta R_t = \Sigma_{i=1}^{p} \varphi_i \Delta R_{t-i} + \Sigma_{j=1}^{q} \omega_j \Delta OIS_{t-j} + \lambda[R_{t-1} - (\beta OIS_{t-1} + c)] + \alpha + \varepsilon_t,$$

According to the first two terms, the change in the lending rate R between month $t - 1$ and month t depends on its own past variations as well as past changes in the 3-month, 2-year, or 10-year OIS rate. In addition, the change in R depends on a term known as the "error correction" term, defined by $[R_{t-1} - (\beta OIS_{t-1} + c)]$ where c is a constant. This term means that the level of the lending rate converges towards a long-term (or "target") value determined by the OIS rate and a constant. Thus, this model assumes that equilibrium is achieved in the long term, where $R = \beta OIS + c$. A negative coefficient λ is expected: when the level of the borrowing rate is higher than this long-term target, the correction mechanism exerts downward pressure on the variation in the lending rate (ΔR). The higher the absolute value of λ, the faster the lending rate converges to its long-term target. For the sake of parsimony, we choose to retain only one lag for each of the model variables (i.e., $p = q = 1$). We compare model (1) with a simple autoregressive model, which corresponds to retaining only the first term of equation (1), by re-estimating its coefficients.

This process is repeated for each new observation available, using a expanding window approach,[5] which enables us to gradually incorporate all historical data in order to expand the estimation sample until June 2024.[6] Once all forecasts have been made using this iterative method, the predictive quality is assessed, as is customary, on the basis of the root mean squared error (see Box 2 below).

5 The initial estimation window (T_0 to $T - 2$) covers the period from February 2007 to November 2011 (i.e., 58 monthly observations).

6 Our experiments have shown that this method performs better than a fixed (10 year) rolling window approach.

BOX 2

Forecast assessment criteria

The root mean squared error (RMSE) is computed as the sum of the squares of the differences between the values forecasted by the model and the actual observed values of the lending rate. The lower the RMSE, the more accurate the model:

$$(2)\ RMSE_h = \sqrt{\tfrac{1}{N}\Sigma_{t=1}^{N}\left(\hat{R}_{T-2+h/t} - R_{T-2+h}\right)^2},$$

where h is the forecast horizon starting from $T-2$, N is the number of forecasts made, R_{T-2+h} is the actual observed value of the lending rate in period $T-2+h$, and $\hat{R}_{T-2+h/T}$ is the forecast of R made in $T-2$ for the horizon $T-2+h$. This criterion allows us to compare the accuracy of forecasts made with an OIS model with that of a pure autoregressive model, used as a benchmark. Thus, for each model m, we calculate a forecast gain for the horizon h, expressed as:

$$(3)\ Gain(m, h) = 1 - \frac{RMSE_h^m}{RMSE_h^{AR}},$$

where $RMSE_h^m$ denotes the forecast error of the model enhanced by the inclusion of an OIS rate, and $RMSE_h^{AR}$ that of the reference model. For example, a positive gain of 0.1 means that model m with OIS rates reduces the forecast error of the borrowing rate by 10%, on average, compared to the strictly autoregressive model, for a given horizon.

3 Results

The table shows the results of the exercise for rates on new loans to households and businesses. For each category of agent and each geographical area, the best model i.e., the one that minimises the root mean squared error (RMSE) remains the same irrespective of the horizon. We find that in France, as in the euro area, the best model for new loans to households is the one that includes 10-year OIS rates. For businesses, it is the model based on 3-month OIS rates for the euro area and 2-year OIS rates for France.[7] This result is consistent with the insights provided by Chart 1 and with the fact that real estate loans generally have a longer average maturity than business loans.

Comparison of the predictive capability of the best models

	France		Euro area	
	Households	Non-financial corporations	Households	Non-financial corporations
Best model	10-year OIS	2-year OIS	10-year OIS	3-month OIS
Horizon (months)	Gain compared to the strictly autoregressive model (%)			
1	7	14	9	16
2	11	27	23	31
3	16	40	34	40
4	20	48	36	45
5	24	54	37	47
6	26	57	38	48
7	27	59	37	48
8	28	58	35	48
9	28	58	34	46
10	28	57	33	45
11	27	55	31	44
12	27	53	30	42

Source: Authors' calculations based on MIR data (European Central Bank) and Bloomberg.
Key: In France, over a 7-month horizon, the model based on 2-year OIS rates improves the forecast of rates on new loans to businesses by 59% compared to the autoregressive model.
Notes: The blue lines, associated with 1- and 2-month horizons, correspond to "nowcasting."
OIS, overnight index swap.

7 We also find that for rates associated with outstanding loans, the best forecasting model is based on 10-year OIS rates, both for households and businesses, in France and in the euro area.

The table also shows the gain obtained with each model compared to the purely autoregressive model. This gain increases up to a forecast horizon of approximately 7 months, where it peaks for French business loans, and then stabilises. At this horizon, the model based on 2-year OIS rates outperforms the autoregressive model by 59%. Across all horizons, the best models augmented with the most relevant market rate for each type of borrowing rate improve forecast accuracy by 36% compared to the autoregressive model.[8]

In addition, Chart 2 highlights the contexts in which taking into account the informational content of market rates significantly improves the quality of forecasts for rates on new loans to French businesses. More precisely, the chart compares the forecasts made using the best model with those obtained from the purely autoregressive model.

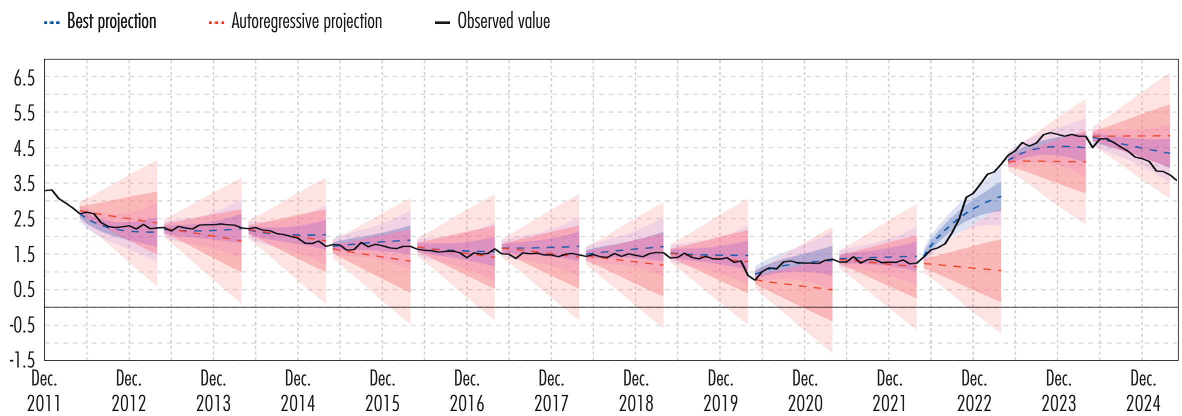
In general, the autoregressive model provides satisfactory forecasts. However, during trend reversals, it leads to substantial forecasting errors due to its inherent inertia. Models that incorporate information from market rates therefore offer real added value, as they enable these turning points to be accurately forecasted. In June 2020, for example, the rate on new loans to French businesses began to rise, reaching 1.01%, which the model using 2-year OIS rates accurately forecasted, while the autoregressive model forecasted a rate of 0.75%.

The June 2022 example also illustrates this performance gap between the two models. In a context of high inflation, fueled by both supply constraints (supply chain disruptions, war in Ukraine) and demand constraints (post-Covid catch-up), the model that incorporates market rates correctly forecasted the forthcoming monetary tightening. At that time, the forecasted rate on new business loans for October 2022 was 2.52%, compared with 1.15% under the autoregressive model, while the actual rate reached 2.49%. This observation is consistent with the financial markets' concomitant expectation of a stronger monetary policy response to inflation (Barthélémy, 2024).

June 2023 provides a final notable example. Against a backdrop of uncertainty about central bank action and the terminal level of key interest rates, the model augmented with market expectations already captured the imminent end of the rise in French business loan rates, although the European Central Bank continued to raise rates until September 2023. It then forecasted an inverted U-shaped

C2 1 to 12-month forecasts for rates on new loans to French businesses: best model vs. purely autoregressive model

(%)



Sources: Bloomberg, European Central Bank (MIR data); authors' calculations.
Note: The black curve corresponds to actual rates on new loans to French businesses. The red dotted lines represent the forecasts of the purely autoregressive model, starting in May of each year, over 1 to 12 month horizons. The blue dotted lines represent the forecasts of the model that also incorporates information on 2-year market rates. The forecast interval is ± 2 mean squared errors.

8 Furthermore, we statistically reject the null hypothesis of a zero gain in favor of a significantly positive gain for the models including OIS rates, at conventional significance levels.

trajectory, in line with the subsequent dynamics of bank rates. In September 2023, its forecast for the business loan rate was 4.46%, close to the observed rate of 4.63%, whereas the autoregressive model predicted only 4.12%.

Models that incorporate market rate information can therefore capture trend reversals, unlike purely autoregressive models. Qualitatively similar conclusions apply to rates on new loans to French households, as well as to euro area households and businesses (see appendix).

⁂

Accurately forecasting changes in bank rates is essential for households, businesses, and policymakers, in particular central banks. This article proposes an effective tool: an autoregressive model augmented with a market rate. This type of model accurately reflects the inertia of lending rates while capturing trend reversals by drawing on the information contained in market expectations. As at 10 December 2025, these models did not forecast a decline in lending rates for French businesses over the next twelve months (see Chart A3 below).

References

Baptista (P.), Dossche (M.), Hannon (A.), Henricot (D.), Kouvavas (O.), Malacrino (D.) and Zimmermann (L.) (2025)
"Monetary policy transmission: From mortgage rates to consumption", *The ECB Blog*, 28 May.

Barthélémy (J.) (2024)
"Market perception of monetary policy responsiveness", *Eco Notepad*, Post No. 359, Banque de France, 8 July. *Read the post*

De Bondt (G.) (2005)
"Interest rate pass through: Empirical results for the euro area", *German Economic Review*, Vol. 6, No. 1, January, pp. 37-78.

Holton (S.) and Rodriguez d'Acri (C.) (2018)
"Interest rate pass through since the euro area crisis", Journal of Banking & Finance, Vol. 96, pp. 277-291.

Hristov (N.), Hülsewig (O.) and Wollmershäuser (T.) (2014)
"The interest rate pass through in the euro area during the global financial crisis", *Journal of Banking & Finance*, Vol. 48, pp. 104-119.

Jude (C.) and Levieuge (G.) (2024)
"The pass through of monetary policy tightening to financing conditions in the euro area and the US. Is this time different?", *SUERF Policy Note*, No. 342, March.

Kok Sørensen (C.) and Werner (T.) (2006)
"Bank interest rate pass through in the euro area: A cross country comparison", *ECB Working Paper Series*, No. 580, January.

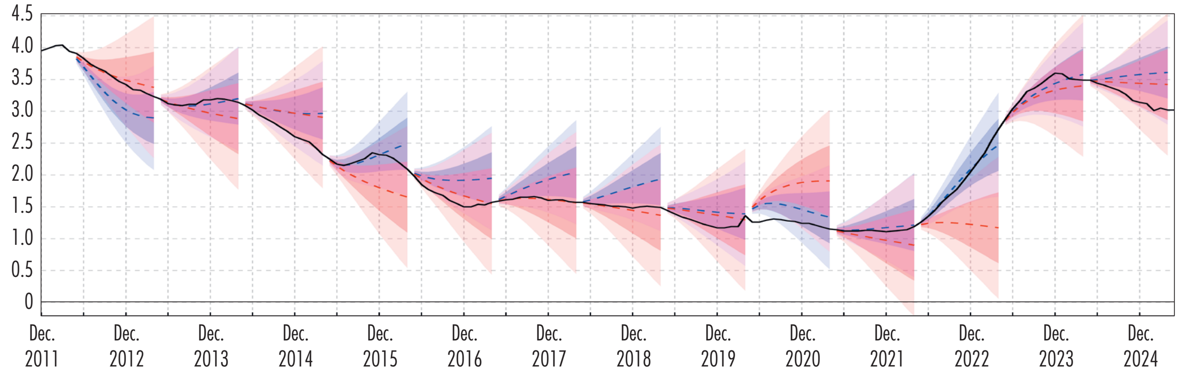
Levieuge (G.) (2017)
"Explaining and forecasting bank loans. Good times and crisis", *Applied Economics*, Vol. 49, No. 8, pp. 823-843.

Appendix
Comparison of forecasting models: best model vs. purely autoregressive model

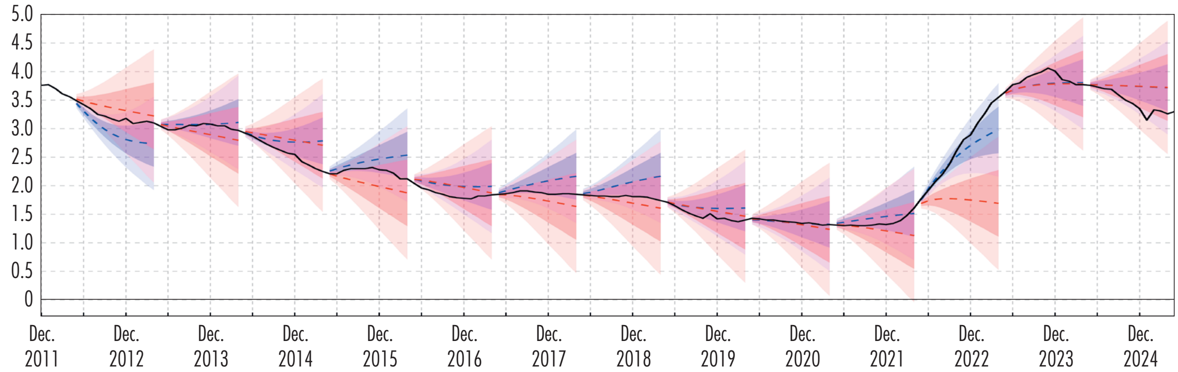
CA1 Forecasts of rates on new real estate loans to households: best model vs. purely autoregressive model
(%)

Best projection · Autoregressive projection · Observed value

a) France



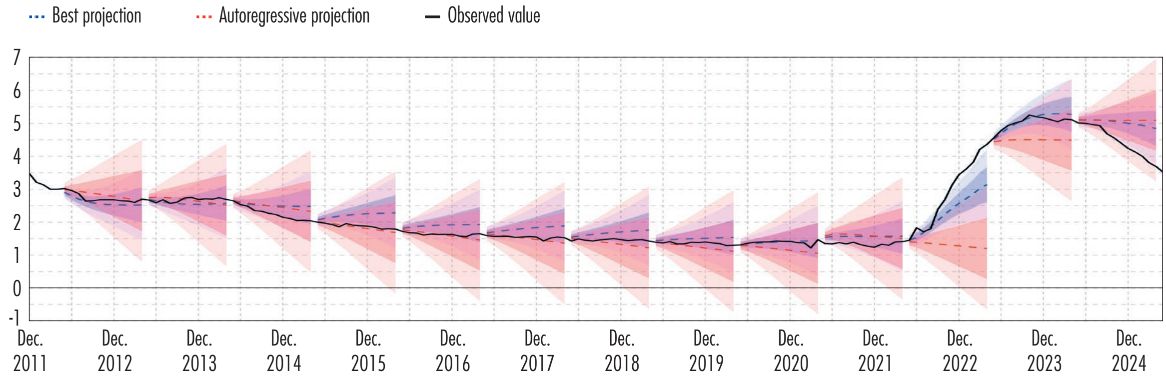
b) Euro area



Sources: Bloomberg, European Central Bank (MIR data); authors' calculations.

CA2 Forecasts of new business loan rates in the euro area: best model vs. purely autoregressive model

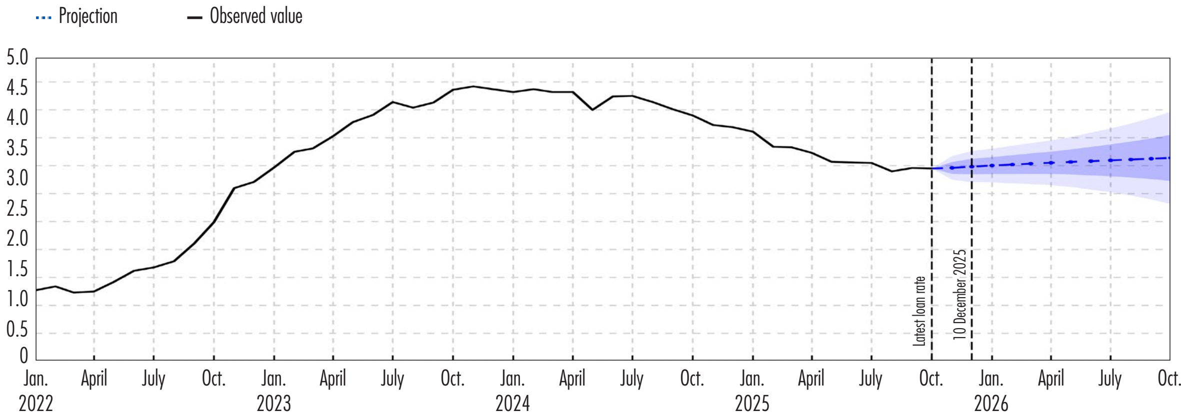
(%)



Sources: Bloomberg, European Central Bank (MIR data); authors' calculations.

CA3 Forecasts of new business loan rates in France

(%)



Source: Authors' calculations based on MIR data (European Central Bank) and Bloomberg.
Notes: Projections based on an autoregressive model (ARDL, auto-regressive distribution lag) augmented with market expectations (2-year OIS). OIS, overnight index swap.
The blue bands represent ± 1 and ± 2 forecast errors (RMSE, root mean squared errors) around the projection.
Data updated on 10 December 2025.

Published by
Banque de France

Managing Editor
Claude Piot

Editor-in-Chief
Claude Blandin-Cornélis

Editor
Nelly Noulin

Translator/English Editor
Stéphanie Evans

Technical production
Studio Creation
Press and Communication

ISSN 1952-4382

To subscribe to the Banque de France's publications
https://www.banque-france.fr/en/alertes/abonnements

BANQUE DE FRANCE
EUROSYSTÈME