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High-Frequency Indicators and GDP Nowcasting in Andorra

Mariarosaria Comunale

SIP/2026/039

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IMF Selected Issues Paper
European Department

High-Frequency Indicators and GDP Nowcasting in Andorra, Principality of Andorra

Prepared by Mariarosaria Comunale

Authorized for distribution by Jeff Danforth
May 2026

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ABSTRACT: High-frequency signals for Andorra were combined into a timely real-time estimate of quarterly GDP growth using a mixed-frequency nowcasting model. The resulting framework delivers a transparent, nowcast of quarterly GDP growth together with uncertainty bands. It can also be used for near-term scenario analysis.

RECOMMENDED CITATION: Comunale, Mariarosaria (2026). High- Frequency Indicators and GDP Nowcasting in Andorra. IMF Selected Issues Paper, SIP/2026/039, International Monetary Fund, Washington DC.

JEL Classification Numbers:	C32; C38; C53; E01
Keywords:	Nowcasting; High-Frequency Indicators; GDP; Mixed-Frequency Models; Dynamic Factor Models; Small Open Economies; Andorra.
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SELECTED ISSUES PAPERS

High-Frequency Indicators and GDP Nowcasting in Andorra

Principality of Andorra

Prepared by Mariarosaria Comunale [1]

[1] We acknowledge Carlos de Resende for his helpful guidance and comments, and Ashwini Arulrajhan (both EUR) for great assistance. We thank Andinet Woldemichael (STA) and the NowHub team for sharing their results and for the collaboration, the participants of seminar during the Article IV mission for helpful discussions and suggestions, and the Andorran authorities for data sharing. Any remaining errors are my own.

HIGH-FREQUENCY INDICATORS AND GDP NOWCASTING IN ANDORRA[1]

High-frequency signals for Andorra were combined into a timely real-time estimate of quarterly GDP growth using a mixed-frequency nowcasting model. The resulting framework delivers a transparent, nowcast of quarterly GDP growth together with uncertainty bands. It can also be used for near-term scenario analysis.

A. Introduction

1. Timely information on economic activity is essential for monitoring the business cycle and informing policy and risk assessments. However, national accounts are released with a delay implying that the most recent, or current, quarter of GDP is typically observed only after a substantial lag. By contrast, there is a wide range of higher-frequency indicators (e.g., tourism flows, mobility and energy usage, external demand proxies, and sectoral activity measures, etc.) that are available at higher frequency and often with shorter publication lags.

2. A survey of available high-frequency indicators suggests they can be effective in understanding short-term trends. Main drivers of the economy on a gross value-added (GVA) basis include tourism, construction, real estate, and retail. An illustrative example of few key indicators is shown in Figure 1. For tourism and retail, the number of overnight tourists has increased in 2025 and retail sales in 2025 to date are broadly in line with past data. Imports related to retail trade and hospitality point to continued strength in GVA through the end of 2025. Imports of construction goods are not highly correlated with GVA growth in the second half of 2025 but energy consumption in the sector suggests activity remained robust. [2] In addition, as Andorra is a microstate and dependent on external factors, we look at key macroeconomic indicators of neighbors France and Spain and the euro area. Figure 2 shows that Andorran GDP growth is highly correlated with growth in Spain and France (correlation coefficients of around 0.9).

3. Selected high frequency indicators are combined with historical national accounts data to develop a nowcasting model of quarterly GDP growth. The focus of the nowcasting exercise is on estimating GDP growth in the current quarter, which is partially observed through high-frequency indicators. While the model can also generate forecasts for the subsequent quarter(s), these should be viewed as a natural byproduct of the framework rather than its primary objective.

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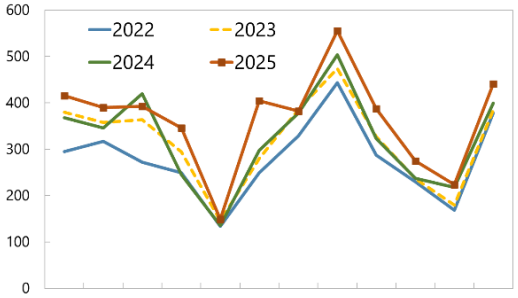
[2] As explained in the Staff Report of the 2026 Article IV consultation, goods imports can provide insights into GVA of construction, retail, and hospitality sectors, given that nearly all goods consumed or used as inputs of production in Andorra are imported. Hence, we have constructed the import of inputs aggregated for the key sectors.

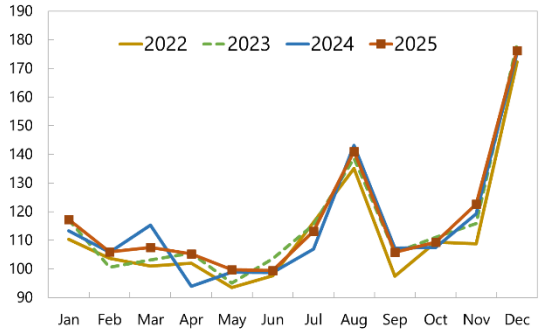
Figure 1. Selected High-Frequency Indicators

Number of Overnight Tourists
(Thousands)



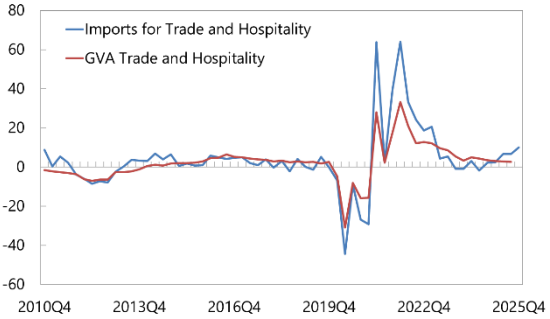
Source: Andorran Authorities

Retail Sales
(Index, Nominal)



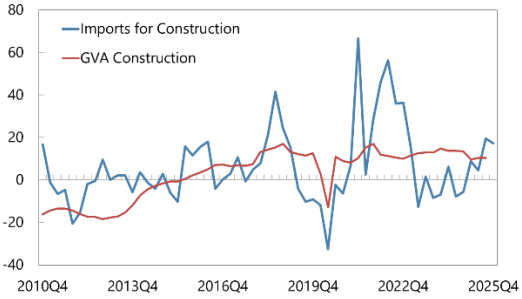
Source: Andorran Authorities

Trade and Hospitality: Imports and GVA
(y/y growth rates)



Note: 2025Q4 refers to the period October-November.
Sources: Andorran authorities and IMF Staff calculations.

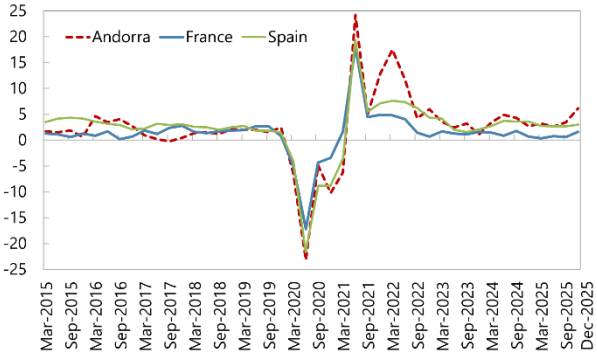
Construction: Imports and GVA
(y/y growth rates)



Note: 2025Q4 refers to the period October-November.
Sources: Andorran authorities and IMF Staff calculations.

Figure 2. Real GDP Growth in Andorra, Spain, and France

Real GDP Growth Rate
(y/y percentange change, NSA)



Source: Haver Analytics

B. Methodology

4. We combine these heterogeneous signals into a timely real-time measure of quarterly GDP growth through a mixed-frequency nowcasting framework. We adopt a mixed-frequency dynamic factor model (DFM) estimated in state-space form (See Appendix and de Resende, 2024 and Linzenich and Meunier, 2024). The key idea is that a small number of latent common factors can summarize co-movements across a large panel of indicators, while idiosyncratic components capture series-specific variation. To avoid overfitting and improve interpretability, the initial indicator set is screened using Bayesian Model Averaging (BMA) (see Steel, 2020), retaining only variables with posterior inclusion probability (PIP) above a chosen threshold.[3] This method weighs each candidate model by its PIP, rather than conditioning on a single specification and helps with smaller time samples with a high number of indicators (see Steel, 2020 and Comunale and Mongelli, 2021 for the euro area).

5. We correct the model for large volatilities in the data. The COVID-19 episode represents a particularly important challenge for nowcasting models because it introduced large, transitory disruptions and sharp changes in volatility that can dominate parameter estimates and inflate forecast uncertainty if not properly treated. We therefore consider a COVID-aware strategy that augments the measurement equations with pandemic dummies and restricts estimation to pre-COVID-19 periods when calibrating "normal-times" uncertainty.

6. The nowcasting dataset combines monthly and quarterly indicators. The estimation sample spans 2015m01 to 2025m11, and the data are retrieved from Haver Analytics or directly from the Andorran Department of Statistics. This window is chosen to ensure both the largest time dimension possible and a fully populated estimation panel, i.e. all series used in the baseline specification are available without internal missing observations over the estimation period (no "blanks"), thereby avoiding changes in the information set that could otherwise affect parameter estimation and model stability. The set includes a total of 20 quarterly series and 90 monthly series covering different sectors of the economy, i.e., tourists flows, employment, prices, vehicle registrations, electricity consumption, and external factors (more details in Appendix). Quarterly series are incorporated via a monthly representation consistent with the mixed-frequency framework (explained in the Appendix).

C. Selection of Leading Indicators

7. The results from the BMA selection are broadly consistent with prior expectations regarding the key drivers of short-term activity. The indicator selection step prioritizes variables capturing external demand and tourism-related dynamics, notably Spain GDP growth and measures of tourist and visitor flows. Domestic price and activity conditions are also informative: notably CPI

[3] To allow for a slightly more inclusive set of predictors, the PIP threshold is set at around 0.4 rather than 0.5, as usually in the literature (See Steel, 2020). Imposing a PIP of 0.5 would remove one-day visitors flows growth from the baseline, but we believe this is an important indicator in the case of Andorra. The results with the removal of this variable are robust compared to the baseline (available upon request).

for health services and electricity consumption of hotel and restaurants enter among the selected series, suggesting that consumption- and tourism-intensive components are central to the current nowcast signal. Variables directly related to construction activity are not selected in the baseline screening stage. As an additional accuracy check, we therefore augment the information set with imports relevant for construction inputs (e.g., construction-related materials and employment in the sector) to assess whether construction-linked external demand improves nowcast performance or alters the factor's composition.

8. It is important to note that indicator selection in a BMA-based nowcasting framework is inherently data- and vintage-dependent. As new information becomes available, or when the exercise is conducted for different quarters (either in real time or retrospectively), the set of selected indicators may vary slightly. For this reason, BMA screening is best viewed as a diagnostic tool rather than a fixed model choice and repeating the exercise as the information set evolves provides a useful robustness check on the stability of the nowcasting signals. However, Spain's GDP growth is selected in all specifications, confirming its role as a robust external anchor for Andorra's short-term outlook, while France GDP growth is not picked by the BMA. In some vintages, alternative energy-consumption indicators, such as electricity use in the financial sector, enter the model, while electricity consumption in hotels and restaurants remains the most consistently selected tourism-related energy proxy besides simple flows.

Table 1. Andorra: Selection of Leading Indicators

Variables	Posterior Inclusion Probability
Spain GDP growth	1.00000
CPI Health services	0.75125
Tourists	0.68273
Hotel and restaurants electricity consumption	0.52927
One-Day Visitors	0.39211

D. Nowcasting GDP Growth

9. The model nowcasts real GDP growth in 2025Q4 at 2.75 percent, year-on-year (yoy). [4,5] This is based on the baseline specification from the BMA exercise and a data vintage ending in November 2025. As nowcasting models are primarily designed to estimate activity in the quarter to

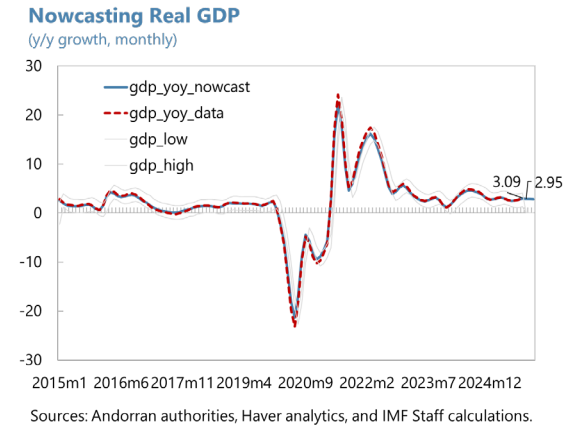
[4] This is a point estimate (mean). The 68 percent confidence bands are between 1.5 and 3.7 and 95 percent bands are between 0 and 5 percent.

[5] We also compare our results with those obtained using the machine learning-based nowcast framework widely used at the IMF NowHub. It is a framework that "horse races" several machine learning models, and select the best one based on RMSEs. The model leverages full set of available indicators *simultaneously* rather than a pre-selected subset. This delivers strong predictive performance, but it may place less emphasis on the economic interpretability of the selected leading indicators. Despite these methodological differences, the results are broadly consistent: the real GDP growth nowcast in 2025Q4 is around 3 percent yoy, with confidence bands that are very similar to those obtained in our baseline specification. The RMSE of the selected model is 1.40.

which the latest high-frequency data pertain, the 2025Q4 estimate is the most accurate. At the same time, the framework also delivers informative short-horizon forecasts: the model projects real GDP growth in 2026Q1 at around 2.6 percent yoy.

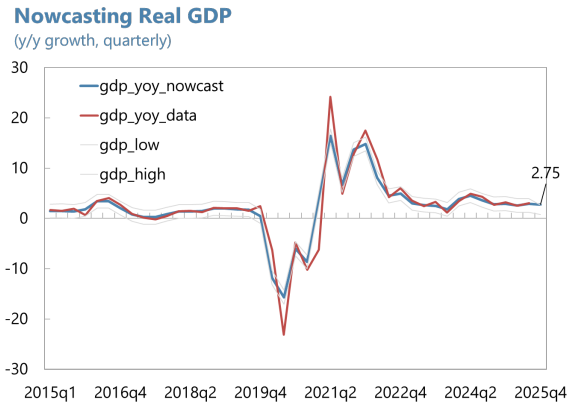
Figure 3. Baseline Nowcast of GDP Growth in the Current Quarter

Our model fits the monthly series very well...



Sources: Andorran authorities, Haver analytics, and IMF Staff calculations.

...then it is translated to quarterly.



Sources: Andorran authorities, Haver analytics, and IMF Staff calculations.

E. Validation and Model Comparison

10. To assess the quality of our model, we also conduct a validation exercise based on "horse race" between alternative specifications. The preferred specification is selected based on the lowest root mean squared error (RMSE) of the target variable, i.e., they deviate less from the actual numbers (in-sample valuation).[6] This exercise can also give a better sense of the range of mean nowcasts. Based on the previous considerations, we repeat the nowcasting exercise with 5 alternative models:

- Check #1: including **financial services**, adding their energy consumption.
- Check #2: including the **construction sector**. We first add in Check #2a: imports of materials for construction (see Section A) [7] then in Check #2b: we also include employment in the construction sector and lastly Check #2c: has only employment.
- Check #3: including **retail trade** more explicitly via employment in retail sector ("trade"). [8]

[6] We evaluate the model in monthly frequency as this is how is estimated in the DFM.

[7] The import baskets have been constructed so a different mix of imports could theoretically lead to better results.

[8] We could not add the retail trade Index because it starts in 2018m1 and we made the sample balanced with all variables available starting 2015m1. This is for both comparability and decreasing biases with larger T.

- Check #4: including **France GDP growth**, which is never captured by BMA, but given the strong linkages with the country, it is worth to see if improves our estimates. In Check #4a France GDP growth is included with Spain, while in Check #4b it is added alone.

- Check #5: removing **Spain GDP growth**, to analyze its contribution.

11. The model with the best fit remains the one based on the BMA selected indicator set. The highest value for 2025Q4 is estimated to be with the inclusion of construction or retail employment at around 3 percent. The baseline model has among the highest values with 2.75 percent growth yoy. The lowest value estimated for 2025Q4 is around 1.4 percent in the models excluding Spain GDP growth (Check #5) or with the inclusion of France GDP growth *only* (Check #4b).[9] These setups perform poorly in in-sample valuation. However, removing Spain, illustrates the contribution of Spanish GDP in the model, i.e., GDP growth in 2025Q4 only considering domestic leading indicators is estimated at 1.4 percent.

Table 2. Andorra: RMSEs Horse Race

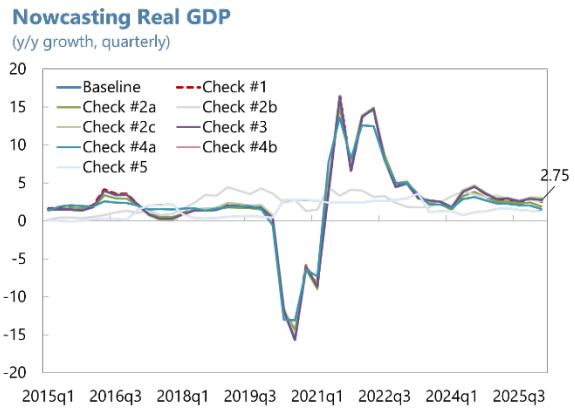
Model	RMSE monthly	Valuation: horse race
Baseline (from BMA selection)	**0.71**	**(1)**
Check #1 (+energy consumption of financial services)	0.74	(3)
Check #2a (+only construction imports of inputs)	0.78	(4)
Check #2b (+construction imports of inputs and employment)	1.99	(6)
Check #2c (+only employment in construction)	0.74	(3)
Check #3 (+employment in retail)	0.73	(2)
Check #4a (+France GDP growth)	0.98	(5)
Check #4b (+France GDP growth – Spain GDP growth)	2.06	(7)
Check #5 (-Spain GDP growth)	2.06	(7)

[9] Once Spain's GDP growth is included, which is picked by the BMA, France adds little independent information and worsens model fit due to multicollinearity, leading BMA to assign it negligible weight. If we include *only* France GDP growth the fit is comparable to the one without any external variables, meaning that in this setup Spain GDP is the best external leading indicator. France does not provide additional information beyond Andorra's own past movements, essentially moving with the cycle rather than helping explain changes in Andorra's GDP.

12. Adding high-frequency indicators for retail, financial services, and construction does not materially improve model fit relative to the baseline. Estimates of GDP growth obtained by including a single indicator per sector, however, remain broadly comparable to the baseline model, with GDP growth ranging between 2.4 and 3.0 percent for 2025Q4. In the case of construction, this likely reflects measurement limitations rather than a lack of economic relevance, as available proxies, such as employment in the sector, which may be constrained by labor shortages, or imports of construction materials, which are based on a constructed measure of inputs (See Figure 1) and do not capture labor inputs, only partially reflect sectoral activity. Including multiple construction proxies simultaneously leads to multicollinearity and a worsened fit. Current high-frequency indicators may underestimate the construction sector's contribution to short-term GDP dynamics.

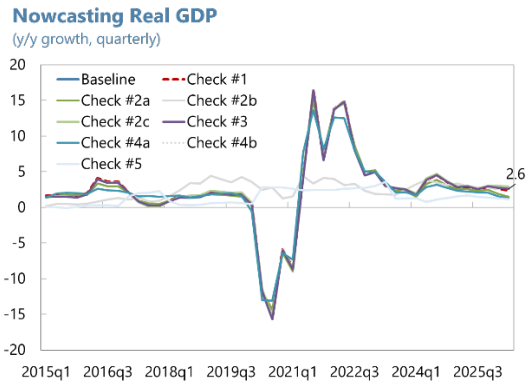
Figure 4. Alternative Nowcasting GDP Growth

Our baseline nowcast value is among the highest: 2.75 percent for 2025Q4…



Sources: Andorran authorities, Haver analytics, and IMF Staff calculations.

…and 2.6 percent for 2026Q1 on average.



Sources: Andorran authorities, Haver analytics, and IMF Staff calculations.

13. We also re-run the model using the updated tourism data released in February 2026, and the results remain robust.[10] Under this specification, real GDP growth in 2025Q4 is estimated at 2.8 percent yoy. It is important to note that these revised tourism series were not available in the November 2025 data vintage and therefore do not constitute real-time information for 2025Q4. As such, this exercise should be interpreted as a robustness check rather than a real-time nowcast.

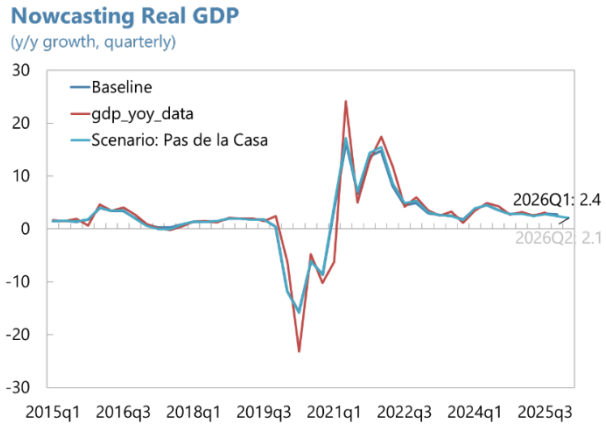
14. Nowcasts for a given quarter improve as monthly high-frequency data are progressively released. The most accurate estimates are obtained once the full set of monthly observations of the quarter becomes available. In practice, this allows reasonably precise estimates already 2–3 months ahead of the official GDP release.

[10] Tourist flows data have been recently improved in collaboration with Andorra Telecom and Andorran Banking Association and revised backwards starting in 2022.

F. Scenario Analysis: Road Closure at Pas de la Casa

15. Beyond nowcasts, the framework can also be used to explore the potential impact of shocks through a scenario analysis. We consider a temporary disruption affecting tourist flows, such as the closure of the road at Pas de la Casa between January 31 and March 9, 2026. In the absence of observed data, projected changes can be imposed on key leading indicators to gauge the implied response of GDP. Assuming a cumulative decline of 10 percent in visitors in January and February 2026, the model-based estimate of real GDP growth in 2026Q1 declines from 2.6 percent to 2.4 percent yoy. This result should be interpreted as indicative, given that it is based on a short-horizon forecast rather than a nowcast.

Figure 5. Scenario: Impact Road Closure at Pas de la Casa



Sources: Andorran authorities, Haver analytics, and IMF Staff calculations.

G. Conclusions and Recommendations

16. This paper develops a mixed-frequency nowcasting framework to provide a timely estimate of quarterly GDP growth in Andorra using high-frequency indicators. The results confirm the central role of tourism-related variables and external conditions—particularly Spain's GDP growth—in explaining short-term fluctuations in activity. Overall, the framework delivers a transparent real-time estimate of GDP ahead of its release.

17. The analysis highlights important data limitations, most notably in capturing construction activity at high frequency. The available proxies only partially reflect sectoral dynamics: either because they do not fully capture labor and imported inputs or because combining them leads to multicollinearity, suggesting that the contribution to growth may be underestimated. Improving the availability and coverage of high-frequency indicators for the construction sector would help better reflect its contribution to short-term GDP dynamics and strengthen real-time monitoring.

18. A replication package is available upon request and will be made available to the authorities. The package includes an annotated Stata code covering data preparation, the BMA

indicators selection, and the estimation of the mixed-frequency dynamic factor model. This allows the framework to be easily updated as new data becomes available and adapted by the authorities for ongoing monitoring.

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Appendix I. Econometric Methodology

This nowcasting framework is implemented in four main steps. These include data preparation, indicator selection based on Bayesian Model Averaging (BMA), model estimation and nowcasting, and a correction to account for distortions related to the COVID-19 period.

1) Data preparation

All series are aligned to a monthly calendar $t = 1, \ldots, T$ and cleaned prior to model estimation. The objective is to (i) ensure stationarity, (ii) harmonize units across indicators, and (iii) accommodate mixed-frequency information in a single monthly state-space representation.

Transformations. For indicators available in levels (e.g., volumes, activity indices), we work with yoy log differences:

$$\Delta^{12} ln(z_t) = ln(z_t) - ln(z_{t-12})$$

which removes low-frequency trends and mitigates seasonality. For indicators expressed in rates or already in percentage units (e.g., shares, balances, survey net percentages), we apply yoy simple differences when more appropriate:

$$\Delta^{12} (z_t) = z_t - z_{t-12}$$

All transformations are chosen to yield approximately stationary series suitable for a linear Gaussian DFM.

Quarterly-to-monthly mapping for GDP. Quarterly GDP yoy growth (for Andorra and main partners) is mapped to the monthly grid to serve as the target equation in the DFM. Specifically, we construct a monthly GDP proxy using shape-preserving piecewise cubic interpolation (PCHIP). This produces a smooth monthly series that preserves the quarter-to-quarter profile implied by observed quarterly values while avoiding spurious oscillations. The DFM is then estimated on the monthly panel including these transformed series and the selected monthly indicators.

2) Bayesian Model Averaging (BMA)

Bayesian Model Averaging (BMA) is used to address model uncertainty arising from a large set of potential predictors. Rather than selecting a single specification ex ante, BMA considers a collection of alternative regression models formed by different combinations of candidate indicators and averages over them using posterior model probabilities (PIP).
Let $y_t$denote GDP growth and $X_t = (x_{1t}, \ldots, x_{Kt})$the set of Kcandidate indicators. Each model $M_j$corresponds to a subset of these indicators where $X_{j,t}$contains only the regressors included in model M_j and is written as:

$$y_t = \alpha_j + X'_{j,t}\beta_j + \varepsilon_{j,t}, \varepsilon_{j,t} \sim \mathcal{N}(0, \sigma_j^2)$$

Given the data D, BMA assigns each model a posterior probability:

$$P(M_j \mid D) = p(D \mid M_j)P(M_j)/\Sigma\, \mathrm{P(D \mid } M_l)P(M_l)'$$

where $p(D \mid M_j)$is the marginal likelihood of model $M_j$and $P(M_j)$is its prior probability. The key object of interest for variable selection is the PIP of indicator x_i, defined as:

$$\text{PIP}_i = \Sigma\, \text{P}(M_j \mid D)$$

which measures the probability that variable x_i belongs to the true predictive model, conditional on the data. Indicators with higher PIPs are those that consistently contribute to explaining short-term GDP dynamics across alternative specifications. In this application, variables with PIPs exceeding a pre-specified threshold are retained and used as inputs to the mixed-frequency dynamic factor model. This BMA-based screening promotes parsimony, mitigates overfitting, and improves the stability of the nowcasting framework by averaging over model uncertainty and selecting indicators with strong in-sample explanatory power, particularly in settings with a large cross-section of indicators and a limited time dimension.

3) Nowcasting

Let I_t denote the information set available at month t. The h-step-ahead nowcast/forecast for GDP growth yoy is: $\hat{y}_{t+h|t} = \mathbb{E}(y_{t+h}|I_t)$ computed via the Kalman filter and smoother implied by the state-space system.[1] Let Y_t denote the $n \times 1$ vector of observed monthly indicators (the monthly GDP proxy) and let $F_t = (f_{1t}, f_{2t})'$ be a 2×1 vector of latent common factors. We impose a two-factor specification, as it delivers the best nowcasting performance in our case compared to a single factor setup while maintaining a parsimonious structure, which is appropriate given the limited time dimension of the data. Allowing for additional factors does not materially improve nowcasting performance and would substantially increase parameter uncertainty (See Banbura and Modugno, 2014).

The model is written in state-space form as:

$$Y_t = \Lambda F_t + \varepsilon_t, \qquad \varepsilon_t \sim (0, \Sigma_\varepsilon)$$

$$F_t = \text{A}F_{t-1} + \eta_t, \qquad \eta_t \sim (0, Q)$$

where Λ is the $n \times 2$ matrix of factor loadings and A captures factor persistence. In the baseline specification, each factor follows an AR(1) process, so $A = diag(\phi 1, \phi 2)$.

4) COVID-19 correction and uncertainty

To account for the COVID-19 period, we include a dummy D_t entering the measurement equation, $Y_t = \Lambda F_t + \Gamma D_t + \varepsilon_t$. For uncertainty quantification, confidence bands are calibrated from pre-Covid volatility to avoid pandemic-driven inflation of forecast-error dispersion. Pandemic months can inflate estimated disturbance variances (Q, R), which in turn widens forecast RMSE bands. To obtain "normal-times" uncertainty, we (re-)estimate the model excluding a COVID-19 window.

[1] The Kalman filter provides a natural mechanism to (i) accommodate missing observations typical of real-time datasets, and (ii) update the GDP nowcast as new monthly releases arrive.

Appendix II. Data Description

Quarterly (20 series): EA, Spain, France GDP and harmonized index of consumer prices (HICP); business confidence by sectors, value of completed real estate transactions and transfers.

Monthly (90 series): merchandise imports by main sectors, retail trade, employment by sectors, CPI by sectors, salary by sectors, vehicle registrations, electricity consumption by sectors, number of overnight tourists and visitors, number of nights spent by overnight tourists.

Appendix II. Table 1. Andorra: Dataset

Variable Description	Frequency
Andorra: Real GDP growth	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. agriculture, forestry and fishing	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. industry	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. construction	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. services	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. wholesale and retail trade; repair of motor vehicles and motorcycles	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. transportation and storage	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. accommodation and food service activities	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. information and communication	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. financial and insurance activities	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. real estate activities	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. professional, scientific and technical activities; administrative and support service activities	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. education; human health and social work activities	Quarterly
Andorra: Harmonized business confidence index by sectors of activity. arts, entertainment and recreation; other service activities	Quarterly
Andorra: Value of completed transactions (quarterly). total	Quarterly
Andorra Hotel Occupancy	Monthly
Andorra: Merchandise imports, aggregate construction	Monthly
Andorra: Merchandise imports, aggregate food and alcohol	Monthly
Andorra: Merchandise imports, aggregate non-food retail	Monthly
Andorra: Retail trade Index general (nominal)	Monthly
Andorra: Retail trade: food	Monthly
Andorra: Retail trade: others	Monthly
Andorra: Retail trade Index general (real)	Monthly

Appendix II. Table 1. Andorra: Dataset (continued)	
Variable Description	**Frequency**
Andorra: Retail trade: food (real)	Monthly
Andorra: Retail trade: others (real)	Monthly
Andorra: Mortgages granted	Monthly-semiannual
Andorra: Employees (NSA, Persons)	Monthly
Andorra: Employees: Agriculture, Herding, Hunting & Forestry (NSA, Persons)	Monthly
Andorra: Employees: Fishing (NSA, Persons)	Monthly
Andorra: Employees: Extraction (NSA, Persons)	Monthly
Andorra: Employees: Manufacturing (NSA, Persons)	Monthly
Andorra: Employees: Electric, Gas & Water Prod & Distribution (NSA, Persons)	Monthly
Andorra: Employees: Construction (NSA, Persons)	Monthly
Andorra: Employees: Trade & Repairs of Motor Vehicles (NSA, Persons)	Monthly
Andorra: Employees: Hotel Business (NSA, Persons)	Monthly
Andorra: Employees: Transport & Communication (NSA, Persons)	Monthly
Andorra: Employees: Financial System (NSA, Persons)	Monthly
Andorra: Employees: Real Estate & Business Service Activ (NSA, Persons)	Monthly
Andorra: Employees: Public & Social Security Administration (NSA, Persons)	Monthly
Andorra: Employees: Education (NSA, Persons)	Monthly
Andorra: Employees: Health & Veterinary Activ, Social Serv (NSA, Persons)	Monthly
Andorra: Employees: Other Social & Personal Service Activ (NSA, Persons)	Monthly
Andorra: Employees: Homes Occupied By Domestic Personal (NSA, Persons)	Monthly
Andorra: Employees: Extraterritorial Organisms (NSA, Persons)	Monthly
Andorra: Employees: Home & Community Work (NSA, Persons)	Monthly
Andorra: Consumer Price Index (NSA, 2021=100)	Monthly
Andorra: CPI: Food & Nonalcoholic Beverages (NSA, 2021=100)	Monthly
Andorra: CPI: Alcoholic Beverages & Tobacco (NSA, 2021=100)	Monthly
Andorra: CPI: Clothing & Footwear (NSA, 2021=100)	Monthly
Andorra: CPI: Housing, Water, Electricity, Gas & Other Fuels (NSA, 2021=100)	Monthly
Andorra: CPI: Furnishing, HH Equipment & Routine Household Maint (NSA, 2021=100)	Monthly
Andorra: CPI: Health (NSA, 2021=100)	Monthly
Andorra: CPI: Transport (NSA, 2021=100)	Monthly
Andorra: CPI: Communications (NSA, 2021=100)	Monthly
Andorra: CPI: Recreation & Culture Services (NSA, 2021=100)	Monthly
Andorra: CPI: Education (NSA, 2021=100)	Monthly
Andorra: CPI: Restaurants & Hotels (NSA, 2021=100)	Monthly
Andorra: CPI: Miscellaneous Goods & Services (NSA, 2021=100)	Monthly
Andorra: Core CPI (NSA, 2021=100)	Monthly
Andorra: CPI: Energy (NSA, 2021=100)	Monthly
Andorra: CPI: Processed Food (NSA, 2021=100)	Monthly
Andorra: CPI: Petroleum Products and Unprocessed Food (NSA, 2021=100)	Monthly
Andorra: CPI: Unprocessed Food (NSA, 2021=100)	Monthly
Andorra: CPI: Petroleum Products (NSA, 2021=100)	Monthly

Appendix II. Table 1. Andorra: Dataset (continued)	
Andorra: CPI: Services (NSA, 2021=100)	Monthly
Variable Description	**Frequency**
Andorra: Vehicle Registrations (NSA, Units)	Monthly
Andorra: Vehicle Registrations: Tourism Vehicles (NSA, Units)	Monthly
Andorra: Average Salary (NSA, EUR)	Monthly
Andorra: Average Salary: Agriculture, Herding, Hunting & Forestry (NSA, EUR)	Monthly
Andorra: Average Salary: Fishing (NSA, EUR)	Monthly
Andorra: Average Salary: Extraction (NSA, EUR)	Monthly
Andorra: Average Salary: Manufacturing (NSA, EUR)	Monthly
Andorra: Average Salary: Electricity, Gas & Water Prod/Distribution (NSA, EUR)	Monthly
Andorra: Average Salary: Construction (NSA, EUR)	Monthly
Andorra: Average Salary: Trade & Repairs of Motor Vehicles (NSA, EUR)	Monthly
Andorra: Average Salary: Hotel Business (NSA, EUR)	Monthly
Andorra: Average Salary: Transport & Communication (NSA, EUR)	Monthly
Andorra: Average Salary: Financial System (NSA, EUR)	Monthly
Andorra: Average Salary: Real Estate & Business Service Activities (NSA, EUR)	Monthly
Andorra: Average Salary: Public & Social Security Administration (NSA, EUR)	Monthly
Andorra: Average Salary: Education (NSA, EUR)	Monthly
Andorra: Average Salary: Health & Veterinary Activ, Social Services (NSA, EUR)	Monthly
Andorra: Average Salary: Other Social & Personal Service Activities (NSA, EUR)	Monthly
Andorra: Average Salary: Homes Occupied by Domestic Personal (NSA, EUR)	Monthly
Andorra: Average Salary: Extraterritorial Organisms (NSA, EUR)	Monthly
Andorra: Average Salary: Home & Community Work (NSA, EUR)	Monthly
Andorra: Electricity Consumption: Domestic Uses (Mwh)	Monthly
Andorra: Electricity Consumption: Construction & Annexes (Mwh)	Monthly
Andorra: Electricity Consumption: Industrial (Mwh)	Monthly
Andorra: Electricity Consumption: Distribution (Mwh)	Monthly
Andorra: Electricity Consumption: Hotel & Restaurants (Mwh)	Monthly
Andorra: Electricity Consumption: Financial Services (Mwh)	Monthly
Andorra: Electricity Consumption: Other Services (Mwh)	Monthly
Andorra: Electricity Consumption: Street Lighting (Mwh)	Monthly
Andorra: Electricity Consumption: Ski Resorts (Mwh)	Monthly
Andorra: Electricity Consumption: Administration (Mwh)	Monthly
Andorra: Electricity Consumption: Other Distributors (Mwh)	Monthly
Andorra: Electricity Consumption (Mwh)	Monthly
Andorra: Average Tourist Nights Spent (Nights)	Monthly
Andorra: Tourism: Number of Visitors (NSA, Persons)	Monthly
Andorra: Tourism: Number of Tourists (NSA, Persons)	Monthly
Andorra: Vehicle Entrances (Number)	Monthly
Andorra: Real Estate Trans: Flats, Detached Houses & Buildings (NSA, Number)	Quarterly
Andorra: Real Estate Transfers: Land & Parking Space (NSA, Number)	Quarterly
Andorra: Real Estate Transfers: Commercial Premises & Warehouses (NSA, Number)	Quarterly
Andorra: Real Estate Transfers: Other Constructions (NSA, Number)	Quarterly

Appendix II. Table 1. Andorra: Dataset (concluded)	
Andorra: Real Estate Transactions (NSA, Number)	Quarterly
Variable Description	**Frequency**
External data	
EA20: HICP: Monetary Union Index: Consumer Prices (NSA, 2015=100)	Monthly
EA20: HICP: Total excl Energy & Unprocessed Food (NSA, 2015=100)	Monthly
Spain: Consumer Prices (NSA, 2021=100)	Monthly
Spain: CPI excluding Non-processed Foods & Energy Products (NSA, 2021=100)	Monthly
France: Harmonized Consumer Price Index (NSA, 2015=100)	Monthly
France: HICP: Total excl Energy & Unprocessed Food (NSA, 2015=100)	Monthly
Spain: Gross Domestic Product (NSAWDA, Mil.Chn.2020.EUR)	Quarterly
France: Gross Domestic Product (NSWDA, Mil.Ch.20.EUR)	Quarterly
EA20: Gross Domestic Product (NSWDA, Mil.Ch.2020.EUR)	Quarterly