



Independent Authority  
for Fiscal Responsibility

**Report**

23 January 2018

# **Report on the Macroeconomic Forecasts for the 2018 Budget of the Autonomous Regions**

The mission of AIReF, the Independent Authority for Fiscal Responsibility, is to ensure strict compliance with the principles of budgetary stability and financial sustainability contained in article 135 of the Spanish Constitution.

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## Executive Summary

The AIReF endorses as likely the macroeconomic forecasts for 2018 for all those Autonomous Regions (ARs) that have presented forecasts different from those of Spain. Following the provisions of LO 6/2013, on the creation of the AIReF, this report focuses on the endorsement of the regional macroeconomic forecasts presented in a differentiated manner from those of the Spanish economy. Given the heterogeneity regarding the drafting and approval of the AR budgets for 2018, twelve Autonomous Regions were analysed, including: Andalusia, Aragon, Balearic Islands, Canary Islands, Castilla y Leon, Castilla-La Mancha, Valencia, Galicia, Madrid, Region of Murcia, Navarra and the Basque Country.

On an individual level, the case of Castilla y León and Valencia are notable as their forecasts are considered weakly likely, with upward biases in the employment forecasts in both cases.

In the case of the Balearic Islands, Castilla-La Mancha, Madrid and the Region of Murcia, their forecasts are considered likely, as there are no upward biases.

Finally, for Andalusia, Aragon, the Canary Islands, Galicia, Navarra and the Basque Country, their forecasts are considered to be prudent, falling in the middle or lower part of the ranges, as shown in Figure 1 for the GDP forecasts.

For its assessment, the AIReF has taken the exceptional nature of the budget calendar into account, as well as the existence of risks arising from the political and institutional uncertainty in Catalonia. The AIReF's autumn analysis on the potential 2018 impact of the institutional shock in Catalonia considered a short-term resolution, with a return to normality at the beginning of 2018. The available information since then has confirmed this assumption, delimiting the impact of the disturbance to the Catalan economic indicators mainly to the month of October. The 2018 forecasts continue to show risk scenarios biased to the downside, derived mainly from the still persistent uncertainty in the current political context in Catalonia. Therefore, the AIReF analysis adds a degree of prudence in its assessment of the Autonomous Regions through asymmetric confidence intervals, with a greater probability mass in its lower part (downside risks).

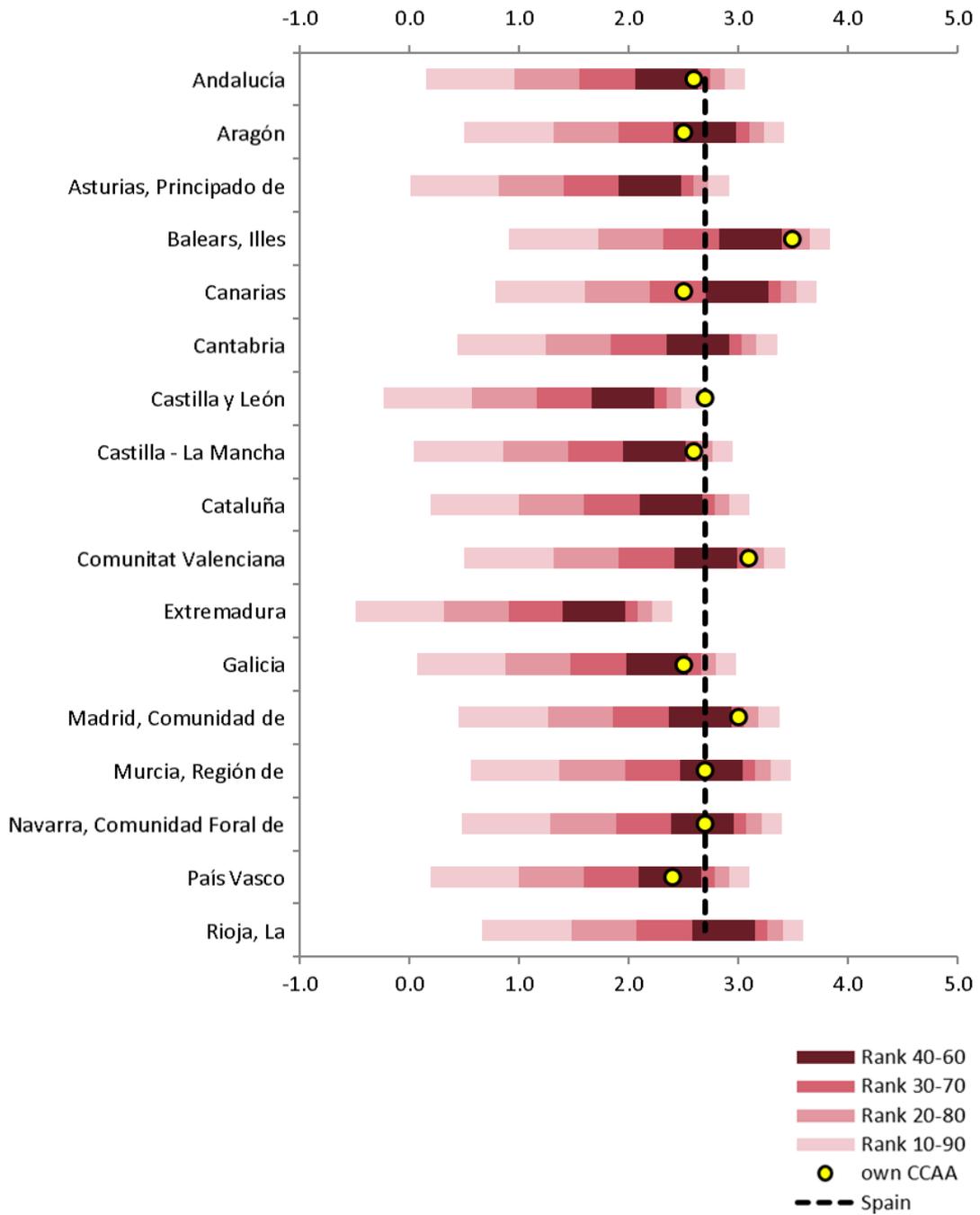
Considering the analysis, the AIReF makes the following recommendation:

1. The ARs of Castilla-La Mancha, Madrid and the Region of Murcia should publish the models and parameters used in the macroeconomic forecasts, following the provisions of Directive 2011/85/EU on the requirements applicable to the budgetary frameworks of the Member States.

In addition, the AIReF provides the following tips for good practices:

1. In the case of the ARs of the Balearic Islands, Castilla y León, Castilla-La Mancha, Navarra and the Basque Country, the AIReF reiterates the importance of including comparisons with other independent forecasts.
2. To the ARs of the Balearic Islands and Castilla-La Mancha, the AIReF recommends the provision of information on employment forecasts, in addition to the GDP forecasts.
3. The ARs of Asturias, Cantabria, Extremadura and La Rioja should differentiate GDP and employment forecasts to facilitate specific assessments.

CHART I. 2018 REAL GDP GROWTH FORECASTS (%)



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# 1. Introduction

The AIReF is mandated to prepare a report on the macroeconomic forecasts that are included in the draft budgets of all Public Administrations, a report that will indicate whether or not the forecasts are supported by it, as provided in articles 14 of its Organic Law and 12 of its Organic Statute. However, in the event that any Public Administration includes or applies a set of forecasts in their budgets that correspond exactly to the budgets of the parent Public Administration whose territorial scope it is a part of, and which would already have been guaranteed by the AIReF, it is not necessary to issue a specific report, but it will suffice to state that circumstance directly in the draft budget.

This report assesses the 2018 forecasts of the twelve Autonomous Regions that have published a macroeconomic scenario different from that of Spain. The AIReF has received information regarding the macroeconomic forecasts that accompany the budgets of all Autonomous Regions (ARs), with the exception of Catalonia. This report assesses the forecasts of twelve of them, as they have presented macroeconomic scenarios different from the official forecasts for the Spanish economy as a whole. As noted in the Organic Law which established the AIReF, the forecasts of Asturias, Cantabria, Extremadura and La Rioja are not subject to assessment, since these four Autonomous Regions have explicitly stated their adherence to the macroeconomic forecasts for Spain, which have previously been endorsed by the AIReF.<sup>1</sup> In the case of Catalonia, considering the exceptional budget and election calendar, the AIReF is waiting to receive the forecasts for 2018 to issue the mandatory report.

The analyzed macroeconomic forecasts are evaluated in terms of the requirements applicable to the budgetary frameworks of the EU Member States, as specified in Article 4 of Directive 2011/85/EU of 8 November 2011. Article 14 of Organic Law 6/2013 on the creation of the AIReF mandates that the AIReF macroeconomic forecast report assesses the suitability of the forecasts to these requirements. In regard to the Autonomous Regions, in this report, the requirements are translated into the following considerations:

- i. Be realistic and use the most up-to-date information.
- ii. Be based on the most likely macro-budgetary scenario or on a more prudent scenario.
- iii. Be compared with forecasts from other independent agencies.
- iv. Include the methodologies, assumptions and relevant parameters that sustain these forecasts.

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<sup>1</sup> The AIReF endorsed the macroeconomic forecasts of the Government in the medium term included in the [Stability Programme Update 2017-2020](#), as well as the update of the macroeconomic table contained in the [2018 Budget Plan](#).

**This report assesses the macroeconomic forecasts of GDP and employment of each of the Autonomous Regions for 2018, analysing bias.** The forecast will be considered biased if a variable is outside the forecast range of the economic model used to contrast it. The estimated model includes relevant information regarding growth at the aggregate level, as well as from complementary regional indicators. The confidence interval around the central estimate is defined in probabilistic terms, including 80% of all possible paths (collecting all the paths between the 10th and 90th percentiles).<sup>2</sup> Unlike the analysis made for the forecasts at the aggregate level, this report does not include an ex-post evaluation of the forecasts of past years, since the macroeconomic forecasts of the Autonomous Regions are very heterogeneous and do not have such a direct and important influence on budget planning.

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<sup>2</sup> All details can be consulted in the Methodological Annex.

## **2. Analysis of Macroeconomic Forecasts**

### **2.1. Methodological observations of the forecast analysis**

Considering the date of issue of the macroeconomic forecasts of most ARs and their reasons for homogeneity, the AIReF's analysis uses the forecasts made before the inclusion of the impact of the political and institutional shock in Catalonia as a central reference for the Spanish economy as a whole. In budgetary terms, 2018 was once again an atypical year, with an extension of the General State Budgets, as happened at the beginning of 2017. This circumstance implies that the Autonomous Region budget approval and presentation cycle has been very heterogeneous. Likewise, most regions have used as a central reference for 2018 the official Spain forecasts issued prior to the inclusion of the potential impact of the uncertainty shock in Catalonia. Therefore, in order to make the analysis fairer, and in order to preserve the homogeneity in the assessment of the AR forecasts, the AIReF has anchored its central assessment on the same time frame.

**The increase in uncertainty and the loss of idiosyncratic confidence in the Catalan economy has led to asymmetric risks, concentrated to the downside.** The autumn AIReF analysis of the potential 2018 impact of the institutional shock in Catalonia considered a short-term resolution, with a return to normalcy at the beginning of 2018. The available information since then has confirmed this detail, delimiting the impact of the disturbance to the Catalan economic indicators mainly to the month of October (see table for more details). The 2018 forecasts continue to show risk scenarios biased to the downside, derived mainly from the still persistent uncertainty in the current political context in Catalonia. Therefore, the AIReF analysis adds a degree of prudence in its assessment of the Autonomous Regions through asymmetric confidence intervals, with a greater probability mass in its lower part (downside risks).

**The following criteria was used to endorse GDP and employment forecasts of those Autonomous Regions that have made forecasts different from the official forecast for the Spanish economy as a whole:**

- The forecasts will not be endorsed if there is an upward bias in both variables (above the 90th percentile).
- They will be endorsed as unlikely if they have an upward bias in one of the two variables.
- They will be endorsed as likely if they have no upward biases, and
- They will be endorsed as prudent if they are in the middle or low range of the confidence interval for both variables, including the possibility of downward

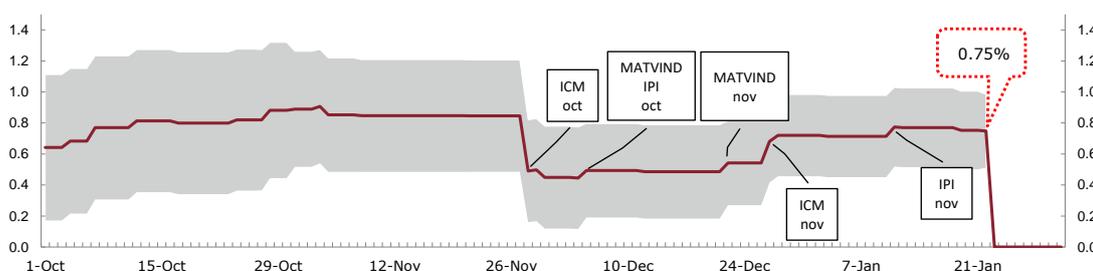
biases. The middle area is defined by the values that are between the 40th and 60th percentiles. The low area is defined as being below the 40th percentile, and the downward bias refers to those values outside the interval (below the 10th percentile).

## BOX 1. Impact of the idiosyncratic shock in Catalonia

The events that have taken place in Catalonia throughout this year and, especially, during the second half of the year, have made it advisable to develop and implement an economic model that allows us to objectively quantify, in real time, the impact of the political and institutional instability Gross Domestic Product (GDP) growth in Catalonia, as well as the uncertainty surrounding these estimates.

Therefore, the AIREF has designed a model to monitor Catalonia's quarterly GDP growth to measure these trends in real-time, as well as to monitor the possible impact of the idiosyncratic developments in this Autonomous Region. This dynamic factorial model allows the AIREF to combine times series of different frequencies, as well as to adequately deal with an unbalanced data panel. The database combines high-frequency indicators with quarterly GDP series forecasts for Catalonia in a manner consistent with the data from both the Quarterly National Accounts and the Regional Accounts.

The trends recorded by the MIPred Cat for Catalan GDP quarter-on-quarter growth in the fourth quarter of 2017 is reflected in the following graph:



**Source:** AIREF

**Note:** The acronyms ICM, IPI and MATVIND refer to the Retail Trade Index, Industrial Production Index and Industrial Vehicle Registration, respectively.

A clearly positive progression can be seen at the beginning of the prediction period, reaching growth values close to 0.9% quarter-on-quarter. However, when the first data corresponding to the retail trade index recorded in October arrived, there was a sudden slowdown, cutting this progress by close to 0.4 percentage points. This indicator was the first that presented clearly negative surprises, causing the model to adjust the implicit predictions of the other indicators to views compatible with a growth close to 0.5%. Subsequent knowledge of the values recorded by these indicators for October (Industrial Production Index, Registration of Industrial Vehicles, Commercial Companies created, Activity Index of the Services Sector, etc.) yielded figures compatible with the initial negative surprise.

When the data from the indicators corresponding to November have been published (published in the second half of December), there were positive surprises, which placed Catalan economic progress at around 0.7%.

At the close of this report, the last known information on the performance of the indicators during the month of December does not change this figure substantially. All this leads the AIREF to conclude that the negative effect induced by the uncertainty, at least for the moment, has been largely concentrated during the month of October, progressively returning to more normal trend values during November and December, more in line with the rest of the national economy.

## 2.2. Analysis of the Forecasts

The AIReF endorses the 2018 macroeconomic forecasts of the twelve ARs that have submitted differentiated information. None of the ARs analysed present biases towards GDP and employment, according to the model used by the AIReF, as shown in Table 1.

**Table 1. Biases and assessment of the 2018 forecasts.**

	GDP		EMPLOYMENT	
	Bias	AR Forecast	Bias	AR Forecast
Andalusia	NO	MEDIUM	NO	MEDIUM
Aragon	NO	MEDIUM	NO	MEDIUM
Asturias				
Balearic Islands	NO	HIGH	...	...
Canary Islands	NO	LOW	NO	LOW
Cantabria				
Castilla y Leon	NO	HIGH	YES	HIGH
Castilla-La Mancha	NO	HIGH	...	...
Catalonia				
Valencian Community	NO	HIGH	YES	HIGH
Extremadura				
Galicia	NO	MEDIUM	NO	MEDIUM
Community of Madrid	NO	HIGH	NO	MEDIUM
Region of Murcia	NO	MEDIUM	NO	HIGH
Navarra	NO	MEDIUM	NO	MEDIUM
Basque Country	NO	MEDIUM	NO	MEDIUM
La Rioja				

\* The "Relative Position" column compares the AR forecast with the self-confidence interval and represents its relative position within the estimated probability mass. It is subdivided into three categories: HIGH, if the AR forecast is above the 60th percentile of the interval; MEDIUM if it is between the 40th and 60th percentiles; and LOW if it is more prudent and is below the 40th percentile.

**According to the above classification, the forecasts of Andalusia, Aragon, the Canary Islands, Galicia, Navarre and the Basque Country are endorsed as prudent, that is, their forecasts are in a Medium relative position (between the 40th and 60th percentiles) or Low (below the 40th percentile) for both variables.**

**In the case of the Balearic Islands, Castilla-La Mancha, Madrid and the Region of Murcia, their forecasts are considered likely, as there are no upward biases. And finally, the forecasts of Castilla y León and Valencia are considered unlikely, with upward biases in the employment forecasts in both cases.**

The details regarding the confidence intervals, as well as the AR's own forecasts, are shown in Tables 2 and 3 (as well as in the panels of Graphs 1 and 2 in the Annex), for GDP and employment, respectively. It can be seen that the GDP forecasts for the Balearic Islands, Castilla y Leon, Castilla-La Mancha and Madrid are inclined towards

optimism, being at the top of the respective confidence intervals. The same can be seen for employment in the case of the Region of Murcia.

**TABLE 1. GDP GROWTH FORECASTS**

GDP	2018								AR Forecast
	Lower limit (10%)	Lower limit (20%)	Lower limit (30%)	Lower limit (40%)	Upper limit (60%)	Upper limit (70%)	Upper limit (80%)	Upper limit (90%)	
Andalusia	0.2	1.0	1.6	2.1	2.6	2.7	2.9	3.1	2.6
Aragon	0.5	1.3	1.9	2.4	3.0	3.1	3.2	3.4	2.5
Asturias *	0.0	0.8	1.4	1.9	2.5	2.6	2.7	2.9	
Balearic Islands	0.9	1.7	2.3	2.8	3.4	3.5	3.7	3.8	3.5
Canary Islands	0.8	1.6	2.2	2.7	3.3	3.4	3.5	3.7	2.5
Cantabria *	0.4	1.2	1.8	2.3	2.9	3.0	3.2	3.4	
Castilla y Leon	-0.2	0.6	1.2	1.7	2.2	2.3	2.5	2.7	2.7
Castilla-La Mancha	0.0	0.9	1.4	1.9	2.5	2.6	2.8	3.0	2.6
Catalonia	0.2	1.0	1.6	2.1	2.7	2.8	2.9	3.1	NP
Valencian Community	0.5	1.3	1.9	2.4	3.0	3.1	3.2	3.4	3.1
Extremadura	-0.5	0.3	0.9	1.4	2.0	2.1	2.2	2.4	
Galicia	0.1	0.9	1.5	2.0	2.5	2.7	2.8	3.0	2.5
Community of Madrid	0.5	1.3	1.9	2.4	2.9	3.1	3.2	3.4	3.0
Region of Murcia	0.6	1.4	2.0	2.5	3.0	3.2	3.3	3.5	2.7
Navarra	0.5	1.3	1.9	2.4	3.0	3.1	3.2	3.4	2.7
Basque Country	0.2	1.0	1.6	2.1	2.7	2.8	2.9	3.1	2.4
La Rioja **	0.7	1.5	2.1	2.6	3.2	3.3	3.4	3.6	

- ARs that have presented their own forecast
- ND Not available in the submitted documentation
- NP Report not submitted
- \* Those of Spain taken as reference in DBP.
- \*\* Those of Spain taken as reference in APE.

**TABLE 2. EMPLOYMENT GROWTH FORECASTS.**

Employment	2018								AR Forecast
	Lower limit (10%)	Lower limit (20%)	Lower limit (30%)	Lower limit (40%)	Upper limit (60%)	Upper limit (70%)	Upper limit (80%)	Upper limit (90%)	
Andalusia	-0.5	0.5	1.3	1.9	2.7	2.9	3.2	3.6	2.6
Aragon	-1.0	0.1	0.8	1.4	2.2	2.5	2.7	3.1	2.2
Asturias *	-1.4	-0.4	0.4	1.0	1.8	2.0	2.3	2.6	
Balearic Islands	0.6	1.7	2.5	3.1	3.9	4.1	4.4	4.7	ND
Canary Islands	0.3	1.3	2.1	2.7	3.5	3.8	4.0	4.4	2.0
Cantabria *	-1.2	-0.2	0.5	1.2	2.0	2.2	2.4	2.8	
Castilla y Leon	-1.6	-0.6	0.1	0.8	1.6	1.8	2.0	2.4	2.8
Castilla-La Mancha	-0.8	0.2	1.0	1.6	2.4	2.6	2.9	3.2	ND
Catalonia	-0.7	0.3	1.1	1.7	2.5	2.7	3.0	3.3	NP
Valencian Community	-0.2	0.9	1.6	2.3	3.1	3.3	3.5	3.9	4.2
Extremadura	-1.8	-0.8	-0.1	0.6	1.3	1.6	1.8	2.2	
Galicia	-0.9	0.2	0.9	1.6	2.3	2.6	2.8	3.2	1.7
Community of Madrid	-0.1	0.9	1.7	2.3	3.1	3.4	3.6	4.0	2.6
Region of Murcia	-0.6	0.4	1.2	1.8	2.6	2.8	3.1	3.4	2.8
Navarra	-1.0	0.0	0.7	1.4	2.2	2.4	2.6	3.0	2.1
Basque Country	-1.4	-0.4	0.3	1.0	1.8	2.0	2.2	2.6	1.7
La Rioja **	-0.5	0.5	1.2	1.9	2.7	2.9	3.2	3.5	

- ARs that have presented their own forecast
- ND Not available in the submitted documentation
- NP Report not submitted
- \* Those of Spain taken as reference in DBP.
- \*\* Those of Spain taken as reference in APE.

Regarding the other applicable requirements defined above, compliance is heterogeneous, as can be seen in Table 4:

- All forecasts make use of the most up-to-date information available and specify the underlying exogenous assumptions.
- We should note the efforts made since the last report, of January 2017, on transparency and the publication of methodologies. Indeed, all Autonomous Regions analysed, with the exception of Castilla-La Mancha, Madrid and the Region of Murcia, have presented information on their basic methodology and the setting of the parameters used. Although the depth and detail of the methodological information has been mixed, it is worth highlighting the case of Galicia, as an example of good practices, since the methodological information provided is extensive and accessible within the economic-financial report that accompanies the draft budget.
- Finally, we should note that seven of the twelve ARs analysed include comparisons with other forecasts: Andalusia, Aragon, the Canary Islands, Valencian Community, Galicia, Madrid and the Region of Murcia.

**TABLE 3. FORMAL AND METHODOLOGICAL REQUIREMENTS**

	OWN FORECAST	UPDATED INFORMATION	COMPARISON WITH OTHER FORECASTS	EXOGENOUS ASSUMPTIONS	METHODOLOGIES AND PARAMETERS
Andalusia	YES	YES	YES	YES	YES (2)
Aragon	YES	YES	YES	YES	YES (2)
Asturias	SPAIN (DBP)	Not applicable	YES	Not applicable	NO
Balearic Islands	YES	YES	NO	YES	YES (2)
Canary Islands	YES	YES	YES	YES	YES (2)
Cantabria	SPAIN (DBP)	Not applicable	NO	Not applicable	NO
Castilla y Leon	YES	YES	NO	YES	YES (2)
Castilla-La Mancha	YES	YES	NO	YES	NO
Catalonia					YES (2)
Valencian Community	YES	YES	YES	YES	YES (2)
Extremadura	SPAIN (DBP)	Not applicable	YES	Not applicable	YES (2)
Galicia	YES	YES	YES	YES	YES (1)
Community of Madrid	YES	YES	YES	YES	NO
Region of Murcia	YES	YES	YES	YES	NO
Navarra	YES	YES	NO	YES	YES (1)
Basque Country	YES	YES	NO	YES	YES (2)
La Rioja	SPAIN (SPU)	Not applicable	NO	Not applicable	NO

- (1) Part of the economic financial report  
(2) Outside the report (email or similar)

### **3. Recommendations and Advice for good practices**

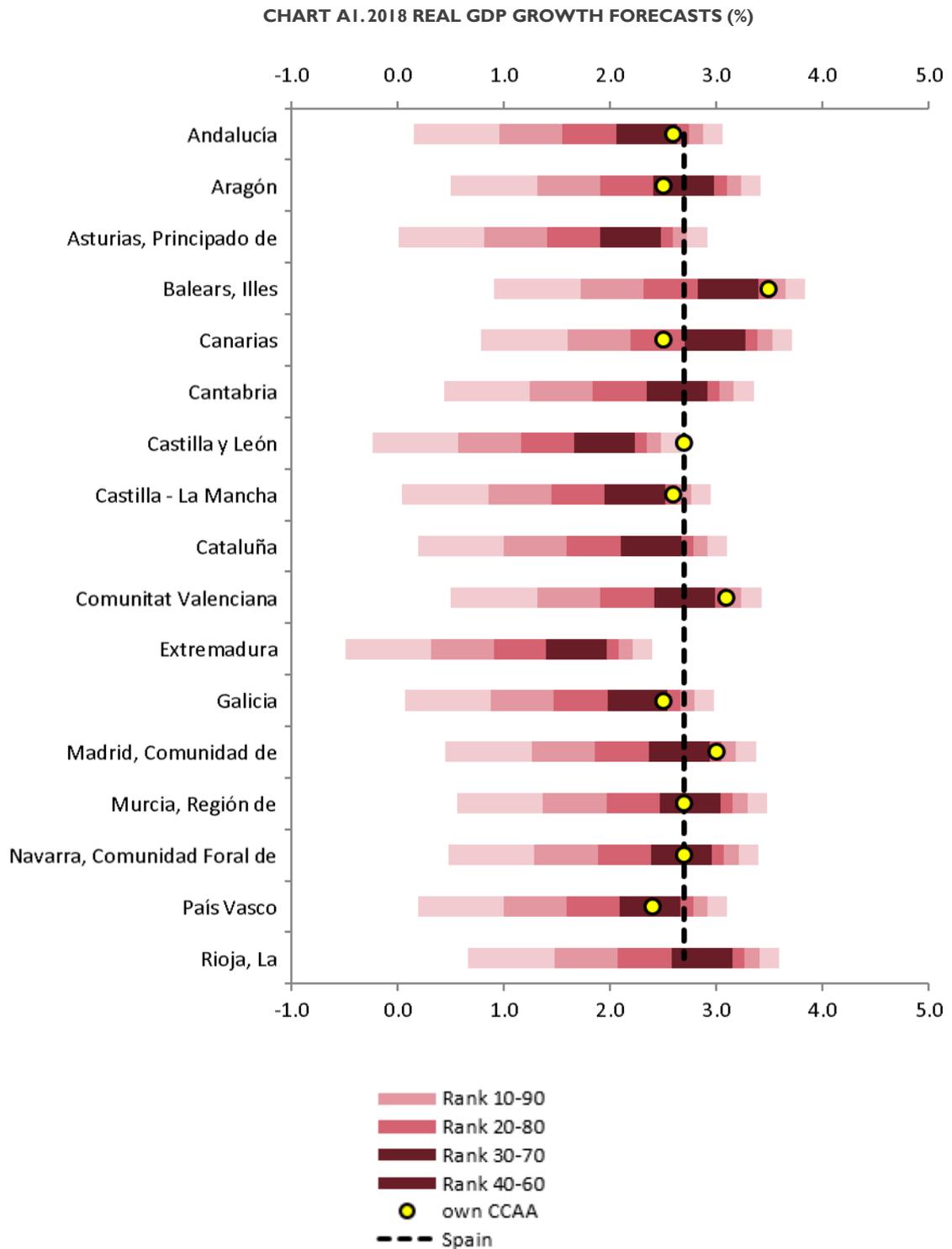
Considering the analysis, the AIReF makes the following recommendation:

2. The ARs of Castilla-La Mancha, Madrid and the Region of Murcia should publish the models and parameters used in the macroeconomic forecasts, following the provisions of Directive 2011/85/EU on the requirements applicable to the budgetary frameworks of the Member States.

In addition, the AIReF provides the following tips for good practices:

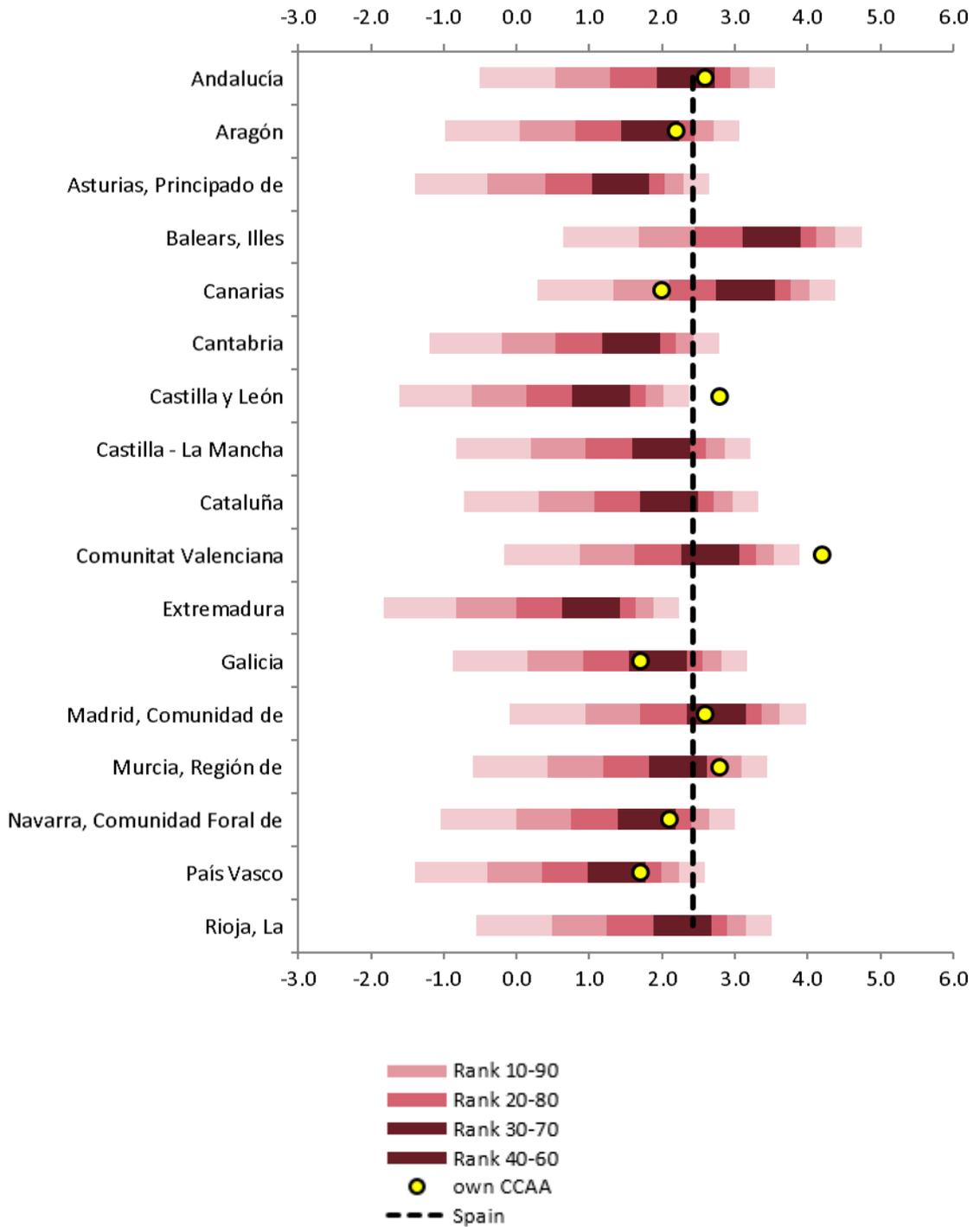
4. In the case of the ARs of the Balearic Islands, Castilla y León, Castilla-La Mancha, Navarra and the Basque Country, the AIReF reiterates the importance of including comparisons with other independent forecasts.
5. To the ARs of the Balearic Islands and Castilla-La Mancha, the AIReF recommends the provision of information on employment forecasts, in addition to the GDP forecasts.
6. The ARs of Asturias, Cantabria, Extremadura and La Rioja should differentiate their GDP and employment forecasts to ease the development of specific assessments.

## 4. GRAPHICAL ANNEX



Source: AIREF

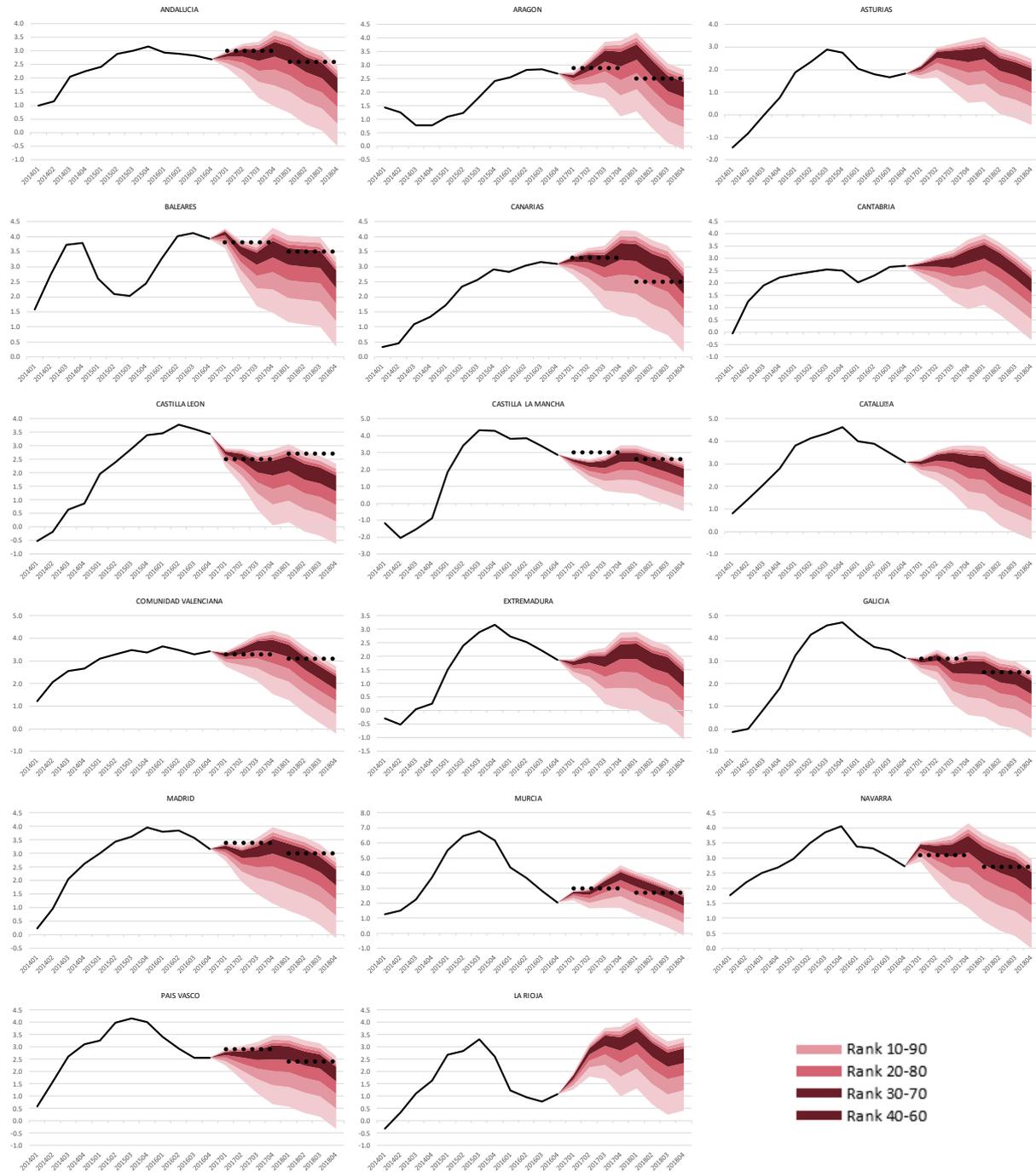
CHART A2. EMPLOYMENT GROWTH FORECASTS IN 2018 (%)



Source: AIREF

**CHART A3. GDP GROWTH FORECAST PANEL (INTERANNUAL GROWHT RATES)**

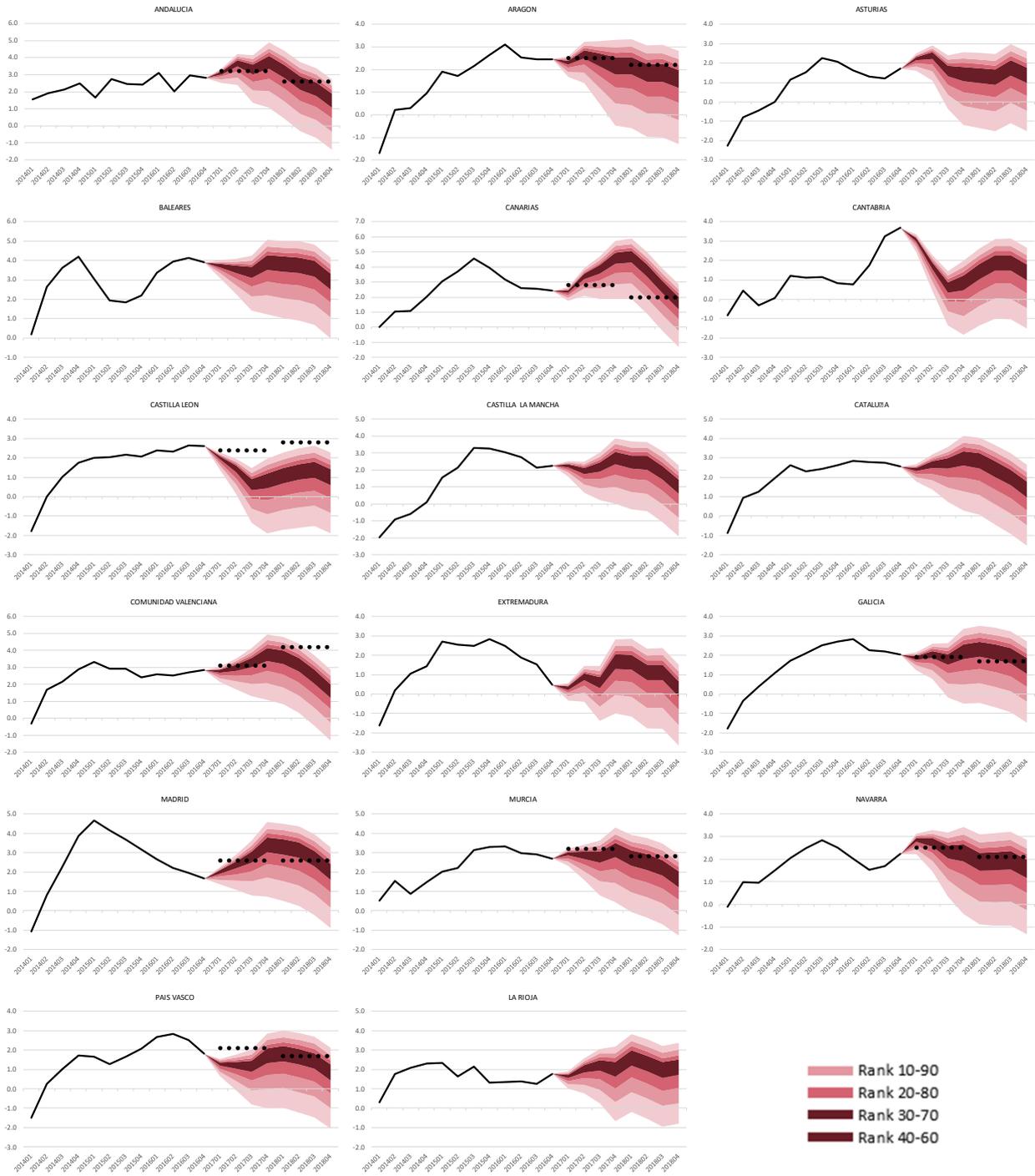
GDP



**Note:** The horizontal lines represent the forecasts of the various ARs

**Source:** AIREF

**CHART A4. GDP GROWTH FORECAST PANEL (INTERANNUAL GROWHT RATES)**



**Note:** The horizontal lines represent the forecasts of the various ARs.

**Source:** AIREF

## 5. METHODOLOGICAL ANNEX

The quantitative methodology used combines three types of statistical information available for regional analysis:

- The monthly data from indicators disaggregated at the territorial level;
- The annual data compiled in terms of national accounts by the Spanish Regional Accounts (SRA); and
- The estimates for the national set published by the Quarterly National Accounts (QNA).

In this manner, the speed and topicality of the indicators, the structural information provided by the SRA and the national reference are combined to ensure consistency in the individual regional estimates.

In order to be able to integrate these diverse sources of information both in their compilation procedures and in their publication schedule (monthly, quarterly and annually), a three-stage procedure has been designed to integrate them in an economically sound and operational manner (See Cuevas *et al*, 2013).

The first stage consists of the extrapolation of the indicators at the regional level through their univariate ARIMA representations. These extrapolated series are corrected for seasonal and calendar effects following the same methodology used by the QNA. Finally, the corresponding circumstantial signals are fused using factorial analysis techniques, leading to a quarterly synthetic index for each Autonomous Region.

In the second stage, the relevance of the circumstances and the rapidity of the indicators are integrated, materialized in the synthetic index estimated in the previous stage, with the structural soundness of the SRA projections in the three main dimensions:

- Consistency, for each region, between the macroeconomic aggregate (GDP, employment) and their components.
- Coherence, for each region, between the projections of their operations in nominal terms (at current prices) and volume terms (linked indexes).
- Coherence, for all regions, between the individual estimates and the national total (cross-sectional consistency).

The use of benchmarking methods (temporal disaggregation) permits us to estimate series of the aggregate (GDP, employment) for the quarter for each of the Autonomous Regions using the circumstantial condensed information in the regional high-frequency synthetic indexes and giving rise to series temporary consistent with the annual SRA series.

Finally, in the third stage, the cross-sectional coherence is ensured between the quarterly estimates of the macroeconomic aggregate (GDP, employment) prepared for each of the ARs with the information provided at the national level by the QNA. Again, benchmarking techniques (multivariate temporal disaggregation) are used to ensure cross-sectional consistency without losing the time consistency reached in the previous stage.

In the specific case of GDP, the temporal consistency requires us to consider the non-additive nature of the chained volume measures used by the National Accounts. This obligation requires us to obtain the links of each Autonomous Region and of Spain (quarterly and annual cash flows valued at the average prices of the previous year); to apply the benchmarking procedures to these variables and reconstruct the volume indexes through the chaining formulas used by the QNA.

The criteria used to evaluate the GDP and employment forecasts can be stated as follows: First, an interval for the growth of both variables [A, B] that contain the 80 percent probability mass of the forecasts is defined using the quantitative methodology described above. This interval is centred around the most likely (or modal) P-value, but is not symmetric around it. The reasons that justify this asymmetric consideration of uncertainty were presented in the AIReF reports on the draft budgets of the Autonomous Regions. See AIReF (2017a, 2017b).

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