



EUROPEAN CENTRAL BANK

EUROSYSTEM

A) Section 1: Questions on your forecasting processes and techniques

1. What is the highest frequency of the following variables in your forecasts?

1a. Short-term forecasts (one year ahead, or less)

	HICP	GDP	Unemployment	Wages
Annual	4	4	4	11
Quarterly	14	43	25	20
Monthly	32	4	19	5
No response	3	2	5	17

1b. Medium-term forecasts (from one to three years ahead)

	HICP	GDP	Unemployment	Wages
Annual	10	12	12	14
Quarterly	20	37	25	18
Monthly	20	2	9	4
No response	3	2	7	17

1c. Long-term forecasts (four to five years ahead)

	HICP	GDP	Unemployment	Wages
Annual	28	28	25	19
Quarterly	8	9	7	7
Monthly	2	1	2	2
No response	15	15	19	25

2. How often do you normally conduct a full* update of your forecasts?

2a. Short-term forecasts (one year ahead, or less)

	HICP	GDP	Unemployment	Wages
Annual	0	0	0	1
Quarterly	30	39	33	25
Monthly	18	10	12	7
Other	1	1	1	1
No response	4	3	7	19

2b. Medium-term forecasts (from one to three years)

	HICP	GDP	Unemployment	Wages
Annual	2	6	6	4
Quarterly	32	34	29	23
Monthly	11	6	6	4
Other	3	3	3	3
No response	5	4	9	19

2c. Long-term forecasts (four-five years ahead)

	HICP	GDP	Unemployment	Wages
Annual	17	18	16	12
Quarterly	15	16	14	13
Monthly	3	1	1	0
Other ()	2	2	2	2
No response	16	16	20	26

- * *The term 'full forecast update' denotes updating also all period-on-period changes across the forecast horizon.
The term 'mechanical update' denotes incorporating the latest data points, but not revising period-on-period changes beyond that, except perhaps to layer on a standard 'rule of thumb' (impulse response style) adjustment to account for changes in the assumed path of oil prices and the exchange rate.*

3. **What typically determines the timing of your full forecast updates*?**

3a. **Short-term forecasts (one year ahead, or less)**

	HICP	GDP	Unemployment	Wages
Data release calendar for:	19	25	11	7
Internal timetable, not directly data release driven	34			
Other (please explain)	6			
No response	2			

3b. **Medium-term forecasts (from one to three years ahead)**

	HICP	GDP	Unemployment	Wages
Data release calendar for:	8	15	4	3
Internal timetable, not directly data release driven	37			
Other (please explain)	5			
No response for:	2			

3c. **Long-term forecasts (four to five years ahead)**

	HICP	GDP	Unemployment	Wages
Data release calendar for:	3	5	3	3
Internal timetable, not directly data release driven	32			
Other (please explain)	6			
No response for:	13			

4. **Bearing in mind that the SPF is typically conducted just after the flash HICP release for the preceding month and the unemployment rate release for the month before that, are your SPF forecasts typically ...**

... full forecast updates* made after these two data releases?	16
... mechanical updates* of your previous forecasts with new data and/or oil price/exchange rate assumptions?	29
... Neither of the above. (please explain below).	8
... No response	0

- * *The term 'full forecast update' denotes updating also all period-on-period changes across the forecast horizon.
The term 'mechanical update' denotes incorporating the latest data points, but not revising period-on-period changes beyond that, except perhaps to layer on a standard 'rule of thumb' (impulse response style) adjustment to account for changes in the assumed path of oil prices and the exchange rate.*

5. **To what extent are your point forecasts model or judgment-based?** (By ‘model’ we mean any mathematical representation of relationships between economic variables; by “judgment” we mean experience and intuition. We recognise that this distinction may depend on the timing and vary over time, so please provide the most representative answer and additional comments as appropriate.)

5a. **Short-term (one year or less)**

	HICP	GDP	Unemployment	Wages
Essentially judgment-based	6	8	10	10
Model-based with judgmental adjustments	36	38	31	23
Essentially model-based	9	6	8	4
No response	2	1	4	16

5b. **Medium-term (from one to three years)**

	HICP	GDP	Unemployment	Wages
Essentially judgment-based	10	16	15	13
Model-based with judgmental adjustments	34	33	30	19
Essentially model-based	6	3	4	5
No response	3	1	4	16

5c. **Long-term (five years ahead)**

	HICP	GDP	Unemployment	Wages
Essentially judgment-based	21	23	19	13
Model-based with judgmental adjustments	16	15	13	12
Essentially model-based	4	4	5	4
No response	12	11	16	24

6. **If you use models for forecasting, which type(s) do you use?** (Tick all that apply)

6a. **Short-term (one year or less)**

	HICP	GDP	Unemployment	Wages
Reduced-form models:				
ARIMA	14	7	4	1
Single equation	28	25	27	18
VAR/VEC	12	11	6	4
Factor models	3	6	1	0
Machine learning e.g. Neural net	2	1	0	0
Others ()	2	3	5	1
Semi-structural models (e.g. FRB-US model):				
Please describe	5	6	3	3
Structural models:				
DSGE	2	2	2	3
IS-LM, AS-AD	3	3	2	1
Others	4	3	3	3
No response:	7	9	15	28

6b. **Medium-term (from one to three years)**

	HICP	GDP	Unemployment	Wages
Reduced-form models:				
ARIMA	11	4	3	2
Single equation	21	16	22	15
VAR/VEC	9	12	5	2
Factor models	2	5	1	1
Machine learning e.g. Neural net	2	1	0	0
Others	2	2	2	1
Semi-structural models (e.g. FRB-US model):				
Please describe	6	7	5	5
Structural models:				
DSGE	4	4	4	4
IS-LM, AS-AD	3	3	2	2
Others	4	4	4	4
No response:	12	16	19	27

6c. **Long-term (five years ahead)**

	HICP	GDP	Unemployment	Wages
Reduced-form models:				
ARIMA	3	2	2	1
Single equation	12	10	11	9
VAR/VEC	3	4	3	2
Factor models	1	2	1	1
Machine learning e.g. Neural net	1	0	0	0
Others	1	1	1	1
Semi-structural models (e.g. FRB-US model):				
Please describe	5	5	4	4
Structural models:				
DSGE	3	4	3	3
IS-LM, AS-AD	0	0	0	0
Others	4	4	4	4
No response:	29	30	32	34

7. **Forecast/model combination and cross-checking**
- 7a. **If you use different types of models, what is your reason for doing so? (*Tick all that apply*)**
- | | |
|--|----|
| Because of the comparative advantages of different models at different <u>forecast horizons</u> | 21 |
| Because of the comparative advantages of different models for different <u>economic variables</u> | 23 |
| Because our regular forecast procedure makes consistent use of (pre-determined) forecast combination techniques* | 4 |
| To cross-check results | 15 |
| No response | 22 |
- 7b. **If you indicated above that you use different types models to cross-check results, how do you determine the final result? (*Tick all that apply*)**
- | | |
|---|----|
| We use results of only the main model as long as the cross-check model results are within a certain tolerance | 7 |
| We make consistent use of (pre-determined) forecast combination techniques* as the cross-check model results are within a certain tolerance | 1 |
| We use the cross-check model to inform the judgements we apply to the output from the main model | 11 |
| There is no 'main model' and no 'cross-check model'; we decide which model's results to use on the basis of plausibility | 8 |
| No response | 30 |
- 7c. **How do you compute your forecasts for the euro area? (*If this varies systematically across forecast variables and horizons, please provide details. Tick all that apply. If you use both approaches, and consider one to be your 'main model' please indicate that in the space to the right.*)**
- | | |
|---|----|
| Directly for the euro area as a whole | 40 |
| By aggregating country/regional forecasts | 33 |
| No response | 3 |
- 7d. **If you use both approaches above, how do you determine the final result? (*If this varies systematically across forecast variables and horizons, please provide details.*)**
- | | |
|---|----|
| We use results of only the main model as long as the cross-check model results are within a certain tolerance | 12 |
| We make consistent use of (pre-determined) forecast combination techniques* | 1 |
| We use the cross-check model to inform the judgements we apply to the output from the main model | 10 |
| No response | 31 |

* For example, taking an equal-weighted average, or using weights determined from historical root mean squared forecast errors.

8. **Typical impact of developments in external variables**

8a. **If your expected path for the oil price over your forecast were suddenly to increase by 10% (and this shock assumed to be permanent), what would be the approximate impact on your forecasts? (in percentage points)?**

	after 1 year	after 2 years	after 3 years	after 5 years
Inflation	0.23	0.12	0.09	0.08
GDP growth	-0.03	-0.06	-0.05	-0.04
Unemployment	0.05	0.07	0.07	0.02

8b. **If your expected path for the EUR/USD exchange rate over your forecast were suddenly to increase by 10% (and this shock assumed to be permanent), what would be the approximate impact on your forecasts? (in percentage points)**

	after 1 year	after 2 years	after 3 years	after 5 years
Inflation	-0.14	-0.28	-0.31	-0.20
GDP growth	-0.13	-0.18	-0.13	0.00
Unemployment	0.02	0.05	0.07	0.01

9. **The impact any potential structural change in economic relationships would have had on economic forecasting**

9a. **If you use models for forecasting, do they allow for non-linearities, e.g. structural breaks or time-varying parameters?**

Yes 13
 No 26
 No response 14

9b. **If you use models for forecasting, has the period since 2013, when inflation was low, affected how they are applied? (By “model” we mean any mathematical representation of relationships between economic variables)**

Yes 25
 No 16
 No response 12

9c. **If yes, what has changed? (Tick all that apply)**

We now complement with a higher degree of judgment 19
 We now make more use of additional cross-check models: 7
 We place more emphasis on model parameters estimated from more recent data 8
 We consider recent history as atypical and exclude/deemphasise when
 ... estimating model parameters 0
 Other changes (please specify below): 0

No response 28

10. **Relationships between point forecasts of different variables**
- 10a. **Are your inflation and GDP growth point forecasts jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 9 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 36 |
| ... no | 6 |
- No response: 2
- 10b. **Are changes in your inflation and GDP growth point forecasts dependent on one another (e.g. according to a price Phillips Curve relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 30; No 17; No response 6 |
| ... in the medium term (from one to three years) | Yes 42; No 8; No response 3 |
| ... in the longer term (five years ahead) | Yes 19; No 16; No response 18 |
- 10c. **If you answered yes above, is that relationship primarily in terms of:**
- | | |
|--|----|
| ... headline HICP inflation | 19 |
| ... a measure of core inflation (e.g. excluding food and energy) | 25 |
- No response: 10
- 10d. **Are your inflation and unemployment point forecasts jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 9 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 26 |
| ... no | 14 |
- No response: 4
- 10e. **Are changes in your inflation and unemployment point forecasts dependent on one another (e.g. according to a price Phillips Curve relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 25; No 19; No response 9 |
| ... in the medium term (from one to three years) | Yes 35; No 14; No response 4 |
| ... in the longer term (five years ahead) | Yes 14; No 19; No response 20 |
- 10f. **If you answered yes above, is that relationship primarily in terms of:**
- | | |
|--|----|
| ... headline HICP inflation | 13 |
| ... a measure of core inflation (e.g. excluding food and energy) | 22 |
- No response: 19
- 10g. **Are your unemployment and GDP growth point forecasts jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 16 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 27 |
| ... no | 7 |
- No response: 3
- 10h. **Are changes in your unemployment and GDP growth point forecasts dependent on one another (e.g. according to an Okun's Law relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 30; No 15; No response 8 |
| ... in the medium term (from one to three years) | Yes 39; No 9; No response 5 |
| ... in the longer term (five years ahead) | Yes 19; No 14; No response 20 |

10i.	Are your <u>wage growth</u> and <u>unemployment</u> point forecasts jointly determined?	
	... yes, formally, i.e. within one model	10
	... yes, but more informally, e.g. in the judgements applied to model outputs	25
	... no	6
	No response:	12
10j.	Are <u>changes</u> in your <u>wage growth</u> and <u>unemployment</u> point forecasts dependent on one another (e.g. according to a wage Philips Curve relationship)?	
	... in the short term (up to one year)	Yes 22; No 13; No response 18
	... in the medium term (from one to three years)	Yes 30; No 9; No response 14
	... in the longer term (five years ahead)	Yes 16; No 14; No response 23
11.	Interpretation of longer-term point forecasts	
11a.	Can your longer-term forecast (five years ahead) of <u>real GDP growth</u> be interpreted as your estimate of potential output growth at that horizon? (<i>This would imply all shocks to growth are (were) expected to have faded by that horizon.</i>)	
	Always	19
	Sometimes	21
	No (please indicate below how they might differ)	3
	No response	10
11b.	Can your longer-term forecast (five years ahead) of the <u>unemployment rate</u> be interpreted as your estimate of the structural unemployment rate e.g. Non-Accelerating-Inflation Rate of Unemployment (NAIRU) at that horizon? (<i>This would imply all shocks to growth are (were) expected to have faded by that horizon.</i>)	
	Always	16
	Sometimes	17
	No (please indicate below how they might differ)	6
	No response	14
11c.	Which of the following information do you typically use to form your longer-term (five years ahead) inflation expectations? (<i>Tick all that apply</i>)	
	Long-term inflation expectations reported in other surveys	16
	Long-term inflation expectations from financial markets	21
	Trends in actual inflation	23
	Trends in monetary aggregates	7
	Trends in wages	20
	Fiscal variables (e.g. debt-to-GDP ratios)	4
	The ECB's inflation objective	35
	Other variables (please specify below)	5
	No response	12

12. **Does your reported point forecast refer to the mean, mode or median of your reported probability distribution in the SPF?**

Mean	20
Mode	8
Median	9
None of the above (please explain below)	1
We do not calculate/report probability distributions	11
No response	6

13. **Are your reported probability distributions model or judgment-based?** *(By “model” we mean any mathematical representation of relationships between economic variables; by “judgment” we mean experience and intuition. We recognise that this distinction may depend on the timing and vary over time, so please provide the most representative answer.)*

13a. **Short-term (one year or less)**

	HICP	GDP	Unemployment
Essentially judgment-based	30	27	27
Model-based with judgmental adjustments	4	7	5
Essentially model-based	5	5	5
No response	14	14	16

13b. **Medium-term (from one to three years)**

	HICP	GDP	Unemployment
Essentially judgment-based	29	27	26
Model-based with judgmental adjustments	7	8	6
Essentially model-based	4	4	4
No response	13	14	17

13c. **Long-term (five years ahead)**

	HICP	GDP	Unemployment
Essentially judgment-based	28	27	25
Model-based with judgmental adjustments	5	5	4
Essentially model-based	3	3	3
No response	17	18	21

14. **Relationships between probability distributions of different variables**
- 14a. **Are your inflation and GDP growth probability distributions jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 4 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 13 |
| ... no | 19 |
| No response: | 17 |
- 14b. **Are changes in your inflation and GDP growth probability distributions typically dependent on one another (e.g. according to a price Phillips Curve relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 12; No 20; No response 21 |
| ... in the medium term (from one to three years) | Yes 15; No 18; No response 20 |
| ... in the longer term (five years ahead) | Yes 6; No 23; No response 24 |
- 14c. **Are your inflation and unemployment probability distributions jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 3 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 10 |
| ... no | 22 |
| No response: | 18 |
- 14d. **Are changes in your inflation and unemployment probability distributions dependent on one another (e.g. according to a price Phillips Curve relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 9; No 23; No response 21 |
| ... in the medium term (from one to three years) | Yes 12; No 21; No response 20 |
| ... in the longer term (five years ahead) | Yes 6; No 22; No response 25 |
- 14e. **Are your unemployment and GDP growth probability distributions jointly determined?**
- | | |
|---|----|
| ... yes, formally, i.e. within one model | 3 |
| ... yes, but more informally, e.g. in the judgements applied to model outputs | 11 |
| ... no | 21 |
| No response: | 18 |
- 14f. **Are changes in your unemployment and GDP growth probability distributions dependent on one another (e.g. according to an Okun's Law relationship)?**
- | | |
|--|-------------------------------|
| ... in the short term (up to one year) | Yes 9; No 21; No response 23 |
| ... in the medium term (from one to three years) | Yes 13; No 19; No response 21 |
| ... in the longer term (five years ahead) | Yes 6; No 22; No response 25 |

15. **How do you form your expectations for other variables?**

Oil prices:

Average of recent prices	16 (length of the sample used:)
Futures prices	27
In-house forecast...	
... essentially model based	4
... model based, with judgement	15
... essentially judgement based	12
Other (please explain)	4
No response:	3

If your oil price assumptions are based on futures prices, which crude oil quotation do you use?

Brent	35
WTI (West Texas Intermediate)	1
Other (please specify)	1

Exchange rates:

Average of recent rates	20 (length of the sample used:)
Futures prices	8
In-house forecast...	
... essentially model based	4
... model based, with judgement	18
... essentially judgement based	14
Other (please explain)	5
No response:	2

Interest rates:

Average of recent rates	10 (length of the sample used:)
Futures prices	8
In-house forecast...	
... essentially model based	9
... model based, with judgement	15
... essentially judgement based	19
Other (please explain)	3
No response:	6

16. **Do you routinely conduct evaluations of the accuracy of your point forecasts?**

Yes 39; No 14; No response 0

16a. **If yes, at which frequency?**

Yearly	18
Quarterly	16
Other	5

16b. **If yes, how do you respond to this?** *(For example, re-estimating model parameters over a different period, re-specifying models in terms of additional variables, altering the degree of judgement, or refreshing the set of tools used to inform judgements. Please provide details below.)*

17. **Do you routinely conduct evaluations of the accuracy of your probability distributions, e.g. using probability integral transform techniques?**

Yes	4
No	39
No response	10

17a. **If yes, at which frequency?**

Yearly	2
Quarterly	2
Other	0

17b. **If yes, how do you respond to this?** *(For example, re-estimating model parameters over a different period, re-specifying models in terms of additional variables, altering the degree of judgement, or refreshing the set of tools used to inform judgements. Please provide details below.)*

Thank you for completing this questionnaire!
