

## LUXEMBOURG

Based on the European Commission 2018 Autumn Forecast, Luxembourg should experience a reduction in the structural primary balance (SPB), from a *surplus* of 1.7% of GDP in 2018 to a *surplus* of 1.1% of GDP in 2020. Real GDP growth should slightly slow down, from 3.1% in 2018 (after 1.5% in 2017) to 2.7% in 2020. Supported by a favourable contribution of the interest rate – growth rate differential, gross government debt would decrease over the forecast horizon, from 21.4% of GDP in 2018 to 20.6% of GDP in 2020.

### 15.1. Short-term fiscal sustainability challenges

***Over the short term (within one year), no significant risks of fiscal stress are foreseen for Luxembourg.***

*The value of the early-detection indicator of fiscal stress, the S0 indicator, is below its critical threshold. Both the fiscal and financial competitiveness sub-indexes do not point to short-term vulnerabilities (each with a value below the critical threshold).*

*Financial markets' perceptions of sovereign risk remain favourable, confirmed by the sovereign yield spreads and the 'AAA' stable ratings assigned by the three major rating agencies to the government debt.*

### 15.2. Medium-term fiscal sustainability challenges

***Over the medium term, fiscal sustainability risks appear to be low for Luxembourg, both according to the sustainability gap indicator S1 and from a DSA perspective. The low and decreasing debt-to-GDP ratio over the medium term in the baseline scenario and the sensitivity to possible macro-fiscal shocks contribute to this assessment.***

#### Medium-term fiscal sustainability challenges: S1 indicator

*The analysis of the sustainability gap indicator S1 points to low risk in the medium term. With a value*

*of -4.8 pps. of GDP, no additional fiscal effort would be needed in the SPB over five years, relative to the baseline 'no-fiscal policy change' scenario, for the debt-to-GDP ratio to reach the reference value of 60% by 2033. On the contrary, the indicator's negative value suggests that under S1 assumptions in Luxembourg there would be some fiscal space. The S1 value is mainly related to the low level of government debt in the last forecast year (contribution of -3.2 pps. of GDP) and the favourable initial budgetary position (contribution of -2.4 pps. of GDP).*

#### Debt sustainability analysis (DSA)

*Over the medium term, Luxembourg is also deemed at low risk from a debt sustainability analysis (DSA) perspective. This risk assessment is driven by results from the baseline scenario, confirmed by alternative and stress test scenarios<sup>(86)</sup>.*

##### Baseline no-fiscal policy change scenario

*Luxembourg is considered at low risk in baseline medium-term debt projections. Under normal economic conditions, and a 'no-fiscal policy change' assumption, government debt would steadily decline throughout the projection period (t+10) to reach 8.9% of GDP in 2029. This projected decrease of around 12 pps. of GDP over a ten year period is largely driven by the SPB (unchanged at 1.1% of GDP)<sup>(87)</sup>, which compensates for increasing ageing costs, and by favourable snowball effects (interest – growth rate differential).*

##### Alternative and stress test scenarios

*Given the low initial stock of debt, negative shocks to growth, interest rates or the primary balance would have a limited impact on the debt ratio. In particular, standard negative sensitivity tests on nominal growth and interest rates would entail a slightly higher debt ratio in 2029 (at round 9.6% of GDP) than in the baseline, although it would remain below 10% of GDP. A very large set of*

<sup>(86)</sup> See Annex 6 in Volume 1 of this report for detailed explanations of the criteria and decisions trees used to derive the overall DSA risk classification.

<sup>(87)</sup> Over the period 1980-2018, in 37% of the cases, EU countries were able to reach an SPB value greater than 1.1% of GDP.

jointly simulated shocks to growth, interest rates and the primary balance, based on the historical volatility of the economy, points to a 17.3% probability of the debt ratio in 2023 being greater than in 2018, entailing low risks given the low starting level. However, such shocks point to some uncertainty surrounding baseline projections, as can be seen from the wide debt distribution cone<sup>(88)</sup>.

*If fiscal policy was reverting to historical behaviour (with the SPB gradually converging to its last 15-year historical average, a surplus of 1.9% of GDP), the debt ratio in 2029 would be about 5.4 pps. of GDP lower than in the baseline scenario.*

### 15.3. Long-term fiscal sustainability challenges

***Over the long term, Luxembourg is deemed at high fiscal sustainability risk. Notwithstanding the low vulnerabilities linked to the low debt burden - captured by the DSA risk assessment -, the fiscal adjustment to stabilise debt over the long term implied by the sustainability gap indicator points to high sustainability risks over the long term as a result of projected increase in the ageing costs.***

### Long-term fiscal sustainability challenges: S2 indicator and DSA

*The analysis of the sustainability gap indicator S2 points to high risk in the long term. This indicator shows that an improvement of 8.1 pps. of GDP in the SPB, relative to the baseline no-fiscal policy change scenario, would be required to stabilise the debt-to-GDP ratio over the long term. This result is due to the projected substantial increase in ageing costs (contribution of 8.7 pps. of GDP), mitigated by a favourable initial budgetary position (-0.6 pps. of GDP). It is in particular the projected increase in public pension expenditure that drives up ageing costs (contribution of 5.8 pps. of GDP) and long-term care spending (contribution of 2.0 pps. of GDP). Under a more adverse scenario in the health care and long-term care areas (with non-demographic drivers pushing costs upward), the S2 indicator would increase to 10.1 pps. of GDP, thus*

<sup>(88)</sup> The difference between the 10th and 90th percentile in 2023 is of around 19.3 pps. of GDP.

still pointing to high fiscal risks in the long term<sup>(89)</sup>.

*Overall, Luxembourg is deemed at high fiscal sustainability risk in the long term. Despite low vulnerabilities linked to the low debt burden - captured by the DSA risk assessment (see section 15.2) -, the sustainability gap indicator S2 indicates that long-term sustainability risks for Luxembourg are high<sup>(90)</sup>.*

### 15.4. Additional mitigating and aggravating risk factors

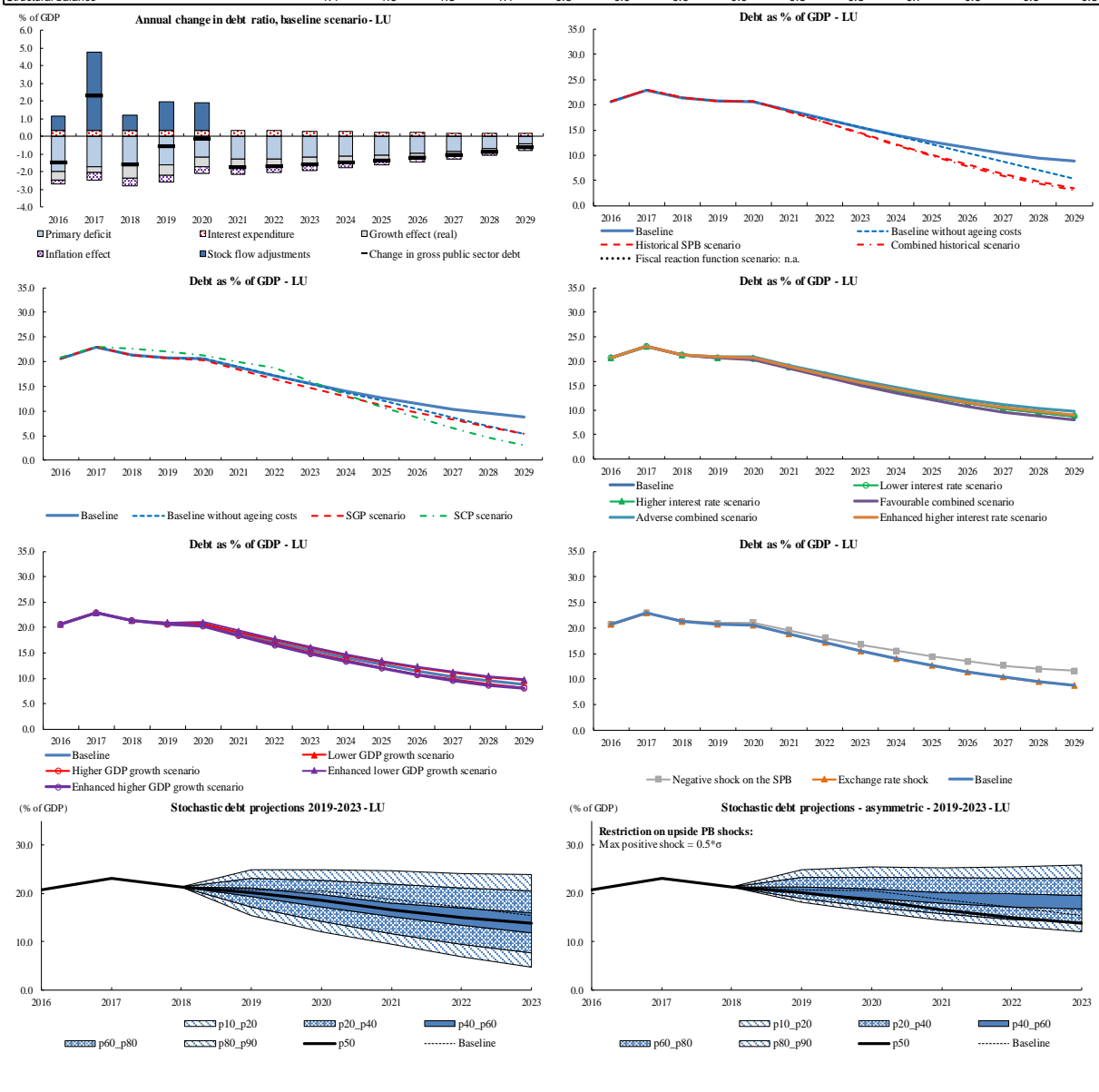
*Some additional mitigating and aggravating risk factors exist. The structure of the government debt, in terms of currency denomination and maturity, as well as the positive net international investment position help mitigating vulnerabilities. Yet, the bank loans-to-deposits ratio and the stock of government guarantees (12.9% of GDP in 2016) point to some contingent liability risks.*

<sup>(89)</sup> See section 4.3 in Volume 1 of this report for a detailed discussion of this scenario.

<sup>(90)</sup> See Chapter 4 (Volume 1) for detailed explanations about the method used to assess long-term sustainability risks.

### 1. General Government Gross Debt projections under baseline, alternative scenarios and sensitivity tests

LU - Debt projections baseline scenario	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Gross debt ratio</b>	<b>20.7</b>	<b>23.0</b>	<b>21.4</b>	<b>20.8</b>	<b>20.6</b>	<b>18.8</b>	<b>17.1</b>	<b>15.5</b>	<b>14.0</b>	<b>12.7</b>	<b>11.4</b>	<b>10.4</b>	<b>9.5</b>	<b>8.9</b>
Changes in the ratio (-1+2+3) of which	-1.5	2.3	-1.6	-0.6	-0.2	-1.8	-1.7	-1.6	-1.5	-1.4	-1.2	-1.1	-0.9	-0.6
<b>(1) Primary balance (1.1+1.2+1.3)</b>	<b>2.0</b>	<b>1.7</b>	<b>1.7</b>	<b>1.6</b>	<b>1.2</b>	<b>1.3</b>	<b>1.2</b>	<b>1.2</b>	<b>1.1</b>	<b>1.0</b>	<b>1.0</b>	<b>0.8</b>	<b>0.7</b>	<b>0.4</b>
<b>(1.1) Structural primary balance (1.1.1-1.1.2+1.1.3)</b>	<b>1.8</b>	<b>1.9</b>	<b>1.7</b>	<b>1.4</b>	<b>1.1</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.1</b>	<b>1.0</b>	<b>1.0</b>	<b>0.8</b>	<b>0.7</b>	<b>0.4</b>
(1.1.1) Structural primary balance (bef. CoA)	1.8	1.9	1.7	1.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
(1.1.2) Cost of ageing						0.0	0.0	0.1	0.2	0.4	0.5	0.7	1.0	1.2
(1.1.3) Others (taxes and property incomes)						0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5
<b>(1.2) Cyclical component</b>	<b>0.2</b>	<b>-0.2</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>(1.3) One-off and other temporary measures</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>(2) Snowball effect (2.1+2.2+2.3+2.4)</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.8</b>	<b>-0.7</b>	<b>-0.5</b>	<b>-0.5</b>	<b>-0.5</b>	<b>-0.4</b>	<b>-0.4</b>	<b>-0.3</b>	<b>-0.3</b>	<b>-0.2</b>	<b>-0.2</b>	<b>-0.2</b>
(2.1) Interest expenditure	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
(2.2) Growth effect	-0.5	-0.3	-0.7	-0.6	-0.5	-0.5	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2
(2.3) Inflation effect	-0.2	-0.4	-0.4	-0.4	-0.3	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2
(2.4) Exchange rate effect linked to the interest rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>(3) Stock-flow adjustments</b>	<b>0.8</b>	<b>4.4</b>	<b>0.9</b>	<b>1.6</b>	<b>1.6</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
(3.1) Base	0.8	4.4	0.9	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3.2) Adjustment due to the exchange rate effect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Pro memora</b>														
Structural balance	1.4	1.6	1.3	1.1	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.5	0.3



## 2. Risk classification and sustainability indicators summary tables

### 2.1. Risk classification summary table

Short term	Medium term	S1	Debt sustainability analysis						DSA	S2	Long term
			Baseline	Historical SPB	Negative shock on GDP growth	Positive shock on interest rate	Negative shock on the SPB	Stochastic projections			
LOW (S0 = 0.1)	LOW	LOW (S1 = -4.8)	Risk category	LOW	LOW	LOW	LOW	LOW	LOW	HIGH (S2 = 8.1)	HIGH
			Debt level (2029)	8.9	3.5	9.6	8.9	11.6			
			Debt peak year	2018	2018	2018	2018	2018			
			Percentile rank	37.0%	29.0%						
			Probability debt higher Dif. between percentiles					17.3% 19.3%			

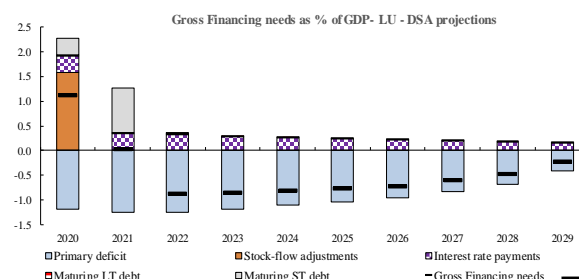
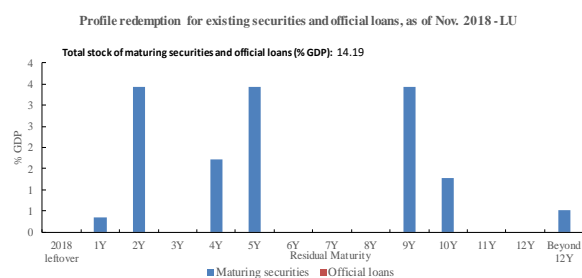
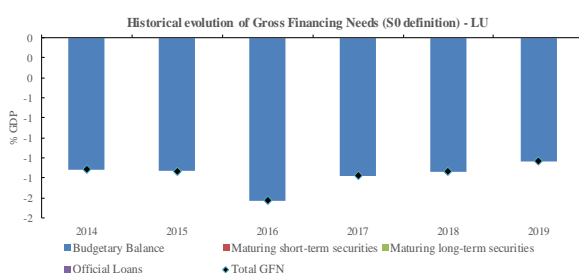
### 2.2. Sustainability indicators

S0 indicator	2009	2018	Critical threshold
Overall index	0.23	0.12	0.46
Fiscal sub-index	0.26	0.00	0.36
Financial competitiveness sub-index	0.22	0.18	0.49

S1 indicator	2017 DSM	FSR 2018		
		COM no-policy change scenario	Historical SPB scenario	AWG risk scenario
Overall index	-3.8	-4.8	-5.3	-4.5
of which Gap to the debt-stabilizing primary balance	-1.3	-1.7	-2.3	-1.7
Cost of delaying adjustment	-0.5	-0.7	-0.8	-0.6
Debt requirement	-3.1	-3.2	-3.8	-3.2
Ageing costs	1.1	0.8	1.5	1.0
Required structural primary balance related to S1	-3.2	-3.7	-3.4	-3.4

S2 indicator	2017 DSM	FSR 2018					
		COM no-policy change scenario	Historical SPB scenario	AWG risk scenario	TFP risk scenario	High life expectancy scenario	Higher interest rate scenario
Overall index	4.4	8.1	7.7	10.1	7.9	8.8	6.4
of which Initial Budgetary position	-0.1	-0.6	-1.4	-0.6	-0.6	-0.6	-0.6
Ageing costs	4.5	8.7	9.1	10.7	8.5	9.4	6.9
of which Pensions	2.6	5.8	6.0	5.8	5.8	6.1	4.6
Health care	0.4	0.8	0.8	1.1	0.7	0.8	0.7
Long-term care	1.2	2.0	2.1	3.6	1.8	2.3	1.6
Others	0.1	0.2	0.2	0.2	0.1	0.2	0.1
Required structural primary balance related to S2	5.0	9.3	9.6	11.2	9.0	9.9	7.5

### 3. Financing needs and financial information



Sovereign Ratings as of Nov 2018, LU	Local currency		Foreign currency	
	long term	short term	long term	short term
Moody's	Aaa	A-1+	Aaa	A-1+
S&P	AAA	A-1+	AAA	A-1+
Fitch	AAA	A-1+	AAA	F1+

Sovereign yield spreads (bp) - as of Nov 2018	10-year	16.0
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#### 4. Risks related to the structure of public debt financing and net International Investment Position

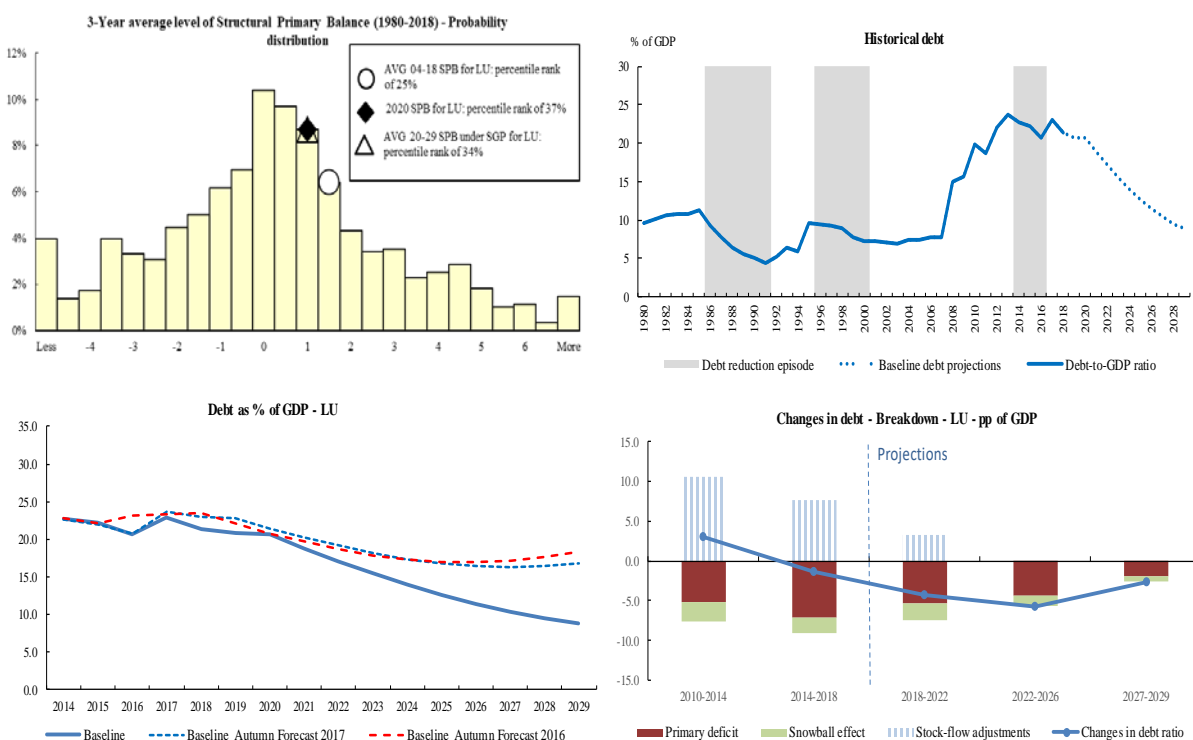
<b>Government debt structure - LU (2017)</b>	Share of short-term government debt (p.p.): 3.7	Share of government debt in foreign currency (%): 0.0	Share of government debt by non-residents (%): 42.7	<b>Net International Investment Position (IIP) - LU (2017)</b>	Net IIP (% GDP): 47.0
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#### 5. Risks related to government's contingent liabilities

General government contingent liabilities		LU					EU
		2011	2013	2015	2016	2017	2016
State guarantees (% GDP)		7.8	8.9	11.3	12.9	n.a.	7.3
of which	One-off guarantees	7.1	8.2	10.5	12.0	n.a.	6.9
	Standardised guarantees	0.8	0.8	0.8	0.9	n.a.	0.4
Public-private partnerships (PPPs) (% GDP)		0.0	0.0	0.0	0.0	n.a.	0.5
		2011	2013	2015	2016	2017	2017
Contingent liabilities of gen. gov. related to support to financial institutions (% GDP)	Liabilities and assets outside gen. gov. under guarantee	3.2	4.9	3.5	4.0	3.7	0.8
	Securities issued under liquidity schemes	0.0	0.0	0.0	0.0	0.0	0.0
	Special purpose entity	0.0	0.0	0.0	0.0	0.0	0.1
	Total	3.2	4.9	3.5	4.0	3.7	1.0

<b>Government's contingent liability risks from banking sector - LU (2017)</b>	Private sector credit flow (% GDP): -15.5	Change in nominal house price index: 5.6	Bank loans-to-deposits ratio (p.p.): 139.0	Share of non-performing loans (%): 0.7	Change in share of non-performing loans (p.p.): -0.4	NPL coverage ratio: 43.9	Probability of gov't cont. liabilities (>3% of GDP) linked to banking losses and recap needs (SYMBOL):
							Reference scenario: 0.01% Adverse scenario: 0.02%

#### 6. Realism of baseline assumptions



7. Underlying macro-fiscal assumptions									
Macro-fiscal assumptions, Luxembourg									
	Levels						Averages		
1. Baseline no-policy change scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	12.7	10.4	8.9	20.9	13.1	15.1
Primary balance	1.7	1.6	1.2	1.0	0.8	0.4	1.5	1.0	1.1
Structural primary balance (before CoA)	1.7	1.4	1.1	1.1	1.1	1.1	1.4	1.1	1.2
Real GDP growth	3.1	3.0	2.7	2.1	1.9	2.1	3.0	2.1	2.3
Potential GDP growth	2.6	2.7	2.8	2.1	1.9	2.1	2.7	2.2	2.3
Inflation rate	2.0	1.8	1.7	2.0	2.0	2.0	1.8	2.0	1.9
Implicit interest rate (nominal)	1.6	1.7	1.7	1.8	1.8	1.8	1.6	1.8	1.7
2. Fiscal reaction function scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Primary balance	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Structural primary balance (before CoA)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Real GDP growth	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
3. SGP scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.3	11.3	8.2	5.4	20.8	11.5	13.8
Primary balance	1.7	1.6	1.5	1.3	1.3	1.2	1.6	1.3	1.4
Structural primary balance	1.7	1.4	1.4	1.3	1.3	1.2	1.5	1.3	1.4
Real GDP growth	3.1	3.0	2.4	2.1	1.9	2.1	2.9	2.2	2.3
4. SCP scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	22.7	22.1	21.3	10.9	6.5	3.1	22.0	11.3	14.0
Primary balance	1.4	1.7	1.9	2.0	1.8	1.4	1.7	2.0	1.9
Structural primary balance (before CoA)	1.3	1.1	1.1	2.2	2.2	2.2	1.2	2.2	1.9
Real GDP growth	4.6	4.6	4.2	2.6	2.5	2.5	4.5	2.7	3.2
Potential GDP growth	3.4	3.5	3.6	2.6	2.5	2.5	3.5	2.8	3.0
Inflation rate	1.0	1.5	1.1	2.0	2.0	2.0	1.2	1.9	1.7
Implicit interest rate (nominal)	1.5	1.2	1.3	1.2	1.2	1.2	1.3	1.2	1.2
5. Historical SPB scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	10.1	6.3	3.5	20.9	10.5	13.1
Primary balance	1.7	1.6	1.2	1.8	1.6	1.2	1.5	1.6	1.6
Structural primary balance (before CoA)	1.7	1.4	1.1	1.9	1.9	1.9	1.4	1.8	1.7
Real GDP growth	3.1	3.0	2.7	2.1	1.9	2.1	3.0	2.1	2.3
6. Combined historical scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	9.8	6.0	3.0	20.9	10.3	12.9
Primary balance	1.7	1.6	1.2	1.8	1.6	1.2	1.5	1.6	1.6
Structural primary balance (before CoA)	1.7	1.4	1.1	1.9	1.9	1.9	1.4	1.8	1.7
Real GDP growth	3.1	3.0	2.7	2.7	2.7	2.7	3.0	2.6	2.7
Implicit interest rate (nominal)	1.6	1.7	1.7	1.8	1.8	1.8	1.6	1.8	1.7
7. Higher IR scenario (standard DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	12.7	10.5	8.9	20.9	13.2	15.1
Implicit interest rate (nominal)	1.6	1.7	1.8	1.8	1.8	1.8	1.7	1.8	1.8
8. Lower IR scenario (standard DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	12.6	10.3	8.8	20.9	13.1	15.0
Implicit interest rate (nominal)	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.7	1.7
9. Higher IR scenario (enhanced DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.7	12.8	10.5	9.0	20.9	13.3	15.2
Implicit interest rate (nominal)	1.6	1.8	1.8	1.9	1.9	1.9	1.7	1.9	1.9
10. Higher growth scenario (standard DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.7	20.4	12.1	9.7	8.2	20.8	12.6	14.7
Real GDP growth	3.1	3.5	3.2	2.6	2.4	2.6	3.3	2.6	2.8
11. Lower growth scenario (standard DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.9	20.8	13.2	11.0	9.6	21.0	13.7	15.5
Real GDP growth	3.1	2.5	2.2	1.6	1.4	1.6	2.6	1.6	1.9
12. Higher growth scenario (enhanced DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.5	20.2	11.9	9.5	8.0	20.7	12.4	14.5
Real GDP growth	3.1	4.2	3.8	2.6	2.4	2.6	3.7	2.6	2.9
13. Lower growth scenario (enhanced DSA)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	21.0	21.1	13.5	11.3	9.8	21.1	13.9	15.7
Real GDP growth	3.1	1.9	1.6	1.6	1.4	1.6	2.2	1.6	1.8
14. Lower SPB scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.9	21.0	14.4	12.6	11.6	21.1	14.9	16.5
Primary balance	1.7	1.4	0.9	0.8	0.5	0.1	1.3	0.7	0.8
Structural primary balance (before CoA)	1.7	1.3	0.8	0.8	0.8	0.8	1.3	0.8	0.9
Real GDP growth	3.1	3.2	2.8	2.1	1.9	2.1	3.0	2.1	2.4
15. Exchange rate depreciation scenario	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.8	20.6	12.7	10.4	8.9	20.9	13.1	15.1
Exchange rate depreciation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
16. Favourable combined scenario (GDP & IR)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.7	20.4	12.0	9.7	8.1	20.8	12.6	14.6
Implicit interest rate (nominal)	1.6	1.6	1.6	1.7	1.7	1.7	1.6	1.7	1.7
Real GDP growth	3.1	3.5	3.2	2.6	2.4	2.6	3.3	2.6	2.8
17. Adverse combined scenario (GDP & IR)	2018	2019	2020	2025	2027	2029	2018-20	2021-29	2018-29
Gross public debt	21.4	20.9	20.8	13.3	11.1	9.7	21.0	13.8	15.6
Implicit interest rate (nominal)	1.6	1.7	1.8	1.8	1.8	1.8	1.7	1.8	1.8
Real GDP growth	3.1	2.5	2.2	1.6	1.4	1.6	2.6	1.6	1.9